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ABSTRACT

This report is part of a comprehensive study of the cognitive, personal, and social development of disadvantaged children over the crucial period age three through grade three. The aims of the study are to identify the components of early education associated with children's development, to determine the environmental and background factors influencing such associations, and, if possible, to describe how these influences operate. The report focuses on: strategy and tactics in conducting research with the disadvantaged, children's cognitive and perceptual development, personal and social development, physical health and nutritional status, and the impact upon children of the family, the classroom, the teacher, the school, the community, and the tester. A summary of the measurement strategies and procedures, systems design and control, and the analysis of the longitudinal study complete the report. An appendix "a" discusses project personnel. A supplementary volume carries appendixes "b" through "f", relating to measures of classroom ratings of children's characteristics, of taxonomy of children's interest, and of contextual differentiations; encyclopedia of proposed measures, by title; index to proposed measures, by variable; and, selection of study sites. [Pages C-5, C-55, G-9, G-10, I-13, L-4, L-5, L-6, and L-7 of the text may not reproduce well because of the small size of the original type.] (RJ)

Disadvantaged Children and Their First School Experiences

ETS-OEO Longitudinal Study

Theoretical Considerations and Measurement Strategies

Appendices Related to Measures

Educational Testing Service
Princeton, N. J.

Report under
OEO Contract Number 4206
and
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APPENDIX b

1. Classroom Ratings of Children's Characteristics
2. Taxonomy of Children's Interest
3. Contextual Differentiations

Classroom Ratings of Children's Characteristics

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Alice Kornblith
Gita Wilder

Purpose

The classroom ratings of children by an observer serve the purpose of monitoring each child's personal-social development.

Ratings have been applied successfully in many studies of young children. However, no previous study has attempted to rate so many children in so many locations with so short a period of observation per child. Therefore, it was first necessary to evaluate the feasibility of the proposed rating procedure. We have found that this approach is feasible within certain limits discussed below.

Scope of Pilot Work

The original variables (see Emmerich's working paper, OEO Interim Report, February, 1968) were translated into a set of scales, and subjected to the following process of revision: (1) The scales were tried out on several Trenton Summer Head Start Children. (2) This trial run was reviewed, with extensive discussion of the scales' clarity, form, theoretical relevance, redundancy, comprehensiveness of coverage, and applicability to the classroom setting. (3) Two more trial runs were conducted, each followed by a similar review. (4) A tentatively final list of variables (pages 5-8) emerged together with a set of recommendations for a rating procedure in the longitudinal study.

Rating Scales

The bipolar scales are given on page 5 and will be used to assess general personality characteristics (Level 3). Seven-point scales of the following form will be used, where X is one pole of the scale and Y is the opposite pole:

(1) Extremely X
(2) Considerably X
(3) Slightly more X than Y
(4) No more X than Y
(5) Slightly more Y than X
(6) Considerably Y
(7) Extremely Y

The unipolar attributes are listed on pages 6-8 and will be used to assess personality characteristics at Level 2. Four-point scales of the following form will be used:

(0) Attribute totally absent during period of observation.
(1) Attribute occasionally present during period of observation.
(2) Attribute frequently present during period of observation.
(3) Attribute continually present during period of observation.

Raters will first go through the complete list of attributes and rate those that are zero on this scale (totally absent). They will then rate the remaining attributes from 1-3. Bipolar ratings will be made after ratings of unipolar attributes have been completed on a child.

It is not feasible to gather separate sets of ratings for formal vs. informal classroom structures. However, parallel ratings will be secured for child-teacher and child-child relations in those cases where such a breakdown is meaningful. All observations upon which ratings are based will be made during relatively unstructured "work" or "free play" periods.

Procedural Recommendations

1. Ratings can be made after 30 minutes of continual observation of a child during a free play period. The observer must be reasonably free to follow the child around the classroom during this observation period.
2. The observer will go to a place free of distraction immediately after observing a particular child. He will then rate the child on the unipolar and bipolar scales (in that order). It takes about 30 minutes to make these ratings so that the observation and rating time needed is about one hour per child.
3. Each child will be rated a second time by another rater within a period of two weeks. This procedure insures a more thorough sampling of each child's behavior and makes possible an appraisal of the short-term stabilities of attributes and children.
4. Because of rapid changes in personal-social behavior in early childhood, it is highly recommended that the above procedure (double ratings within two weeks) be repeated twice within each school year for the longitudinal sample, especially during the first two years of school.
5. In order to have normative information on changes within a school year, it is proposed that during the first year the longitudinal sample be divided randomly into three groups of classrooms. One group could be rated first in November and again in March, one in December and again in April, and another in January and again in May.
6. The intent is to assess personal-social characteristics after the initial period of adaptation to the classroom. Therefore, we suggest that ratings be made after the child has been in the class for at least four weeks.
7. It is axiomatic among researchers who have employed rating procedures that ratings are highly valuable when made by fully qualified persons but are virtually useless when controls on quality are relaxed. Raters will need to be mature, reliable, and experienced with young children.

Perhaps the best source will be mothers with as much college education as possible, preferably in the behavioral sciences.

8. An intensive period of training is required for each rater, perhaps lasting two weeks. Training will consist of (a) learning a manual that explains field procedures as well as the scales, (b) viewing video tapes of classrooms, making ratings, and discussing them in groups, and (c) making observations of children in classrooms under actual field conditions, making ratings, and discussing them with trainers in individual consultation sessions.
9. Each attribute has been carefully defined and illustrated, using examples from pilot work and published research. A manual of definitions, illustrative behaviors, and qualifications has been compiled and will be used in the field as well as for training.
10. Rating procedures of the type used here generally have been found to yield moderate inter-rater reliabilities. However, this fact is no guarantee that satisfactory inter-rater reliabilities will be achieved under the conditions of the present study. Therefore, rater reliabilities will be determined for the first year's cross-sectional sample. Simultaneous observations of the same children will be made by pairs of observers who will independently rate the children on all scales.
11. Minor revisions of the scales are just being completed and can readily be incorporated into the study.

Bipolar Characteristics

1. Withdrawn vs. involved
2. Masculine vs. feminine
3. Tolerates frustration vs. vulnerability
4. Rebellious vs. compliant
5. Expressive vs. restrained
6. Tense vs. relaxed
7. Oriented toward adults vs. oriented toward children
8. Sensitive to others vs. self-centered
9. Submissive vs. dominant
10. Active vs. passive
11. Apathetic vs. energetic
12. Stable vs. unstable
13. Solitary vs. social
14. Assertive, bold vs. timid, fearful
15. Dependent vs. independent
16. Constructive vs. destructive
17. Aimless vs. purposeful
18. Academically motivated vs. otherwise motivated
19. Agressive vs. affectionate toward others
20. Socially secure vs. socially insecure
21. Rigid vs. flexible
22. Happy vs. unhappy

Attributes

A. Dependency

1. Seeks physical affection
2. Seeks physical proximity of other
3. Seeks help
4. Seeks attention through positive bid
5. Seeks attention through deliberate negative bid
6. Seeks attention through weak bid
7. Seeks praise or approval from other
8. Seeks evaluation from other
9. Seeks or makes a comparative evaluation
10. Demanding of other
11. Tries to get other to do what self is expected to do
12. Exhibits helplessness
13. Rejects positive bid from other

B. Social Skills

14. Seeks permission to do something
15. Conforms to routine or routine request of other
16. Engages in complementary behavior
17. Engages in parallel activity
18. Exhibits interest in or concern for other in distress
19. Praises or expresses approval toward other
20. Expresses criticism of other
21. Reciprocates
22. Tries to "make up"

C. Sociality

23. Friendly
24. Nurturant
25. Attempts to influence or control other
26. Behaves competitively
27. Seeks leadership
28. Smiles and/or laughs

D. Interests

29. Engages in gross motor activity
30. Engages in fine manipulative activity
31. Engages in cognitive activity
32. Engages in fantasy activity
33. Engages in artistic activity
34. Concerned with satisfaction of physical need

E. Autonomous Achievement

35. Takes initiative in carrying out own activity
36. Tries to pursue difficult task
37. Attempts to overcome obstacles by himself
38. Exhibits persistence
39. Completes activity by himself
40. Gets intrinsic satisfaction from activity or task
41. Praises self

F. Aggression

42. Threatens to act aggressively
43. Possessive
44. Verbally aggressive
45. Physically aggressive toward other
46. Deliberately aggressive toward property
47. Expresses negative feeling about self, possession, or own product

G. Receptivity to Learning

48. Exhibits visual curiosity
49. Exhibits active curiosity
50. Seeks information from other
51. Responsive to teaching
52. Corrects or modifies performance to meet own standard
53. Imitates behavior of other
54. Instructs or demonstrates for other

H. Verbal Behavior

55. Attempts to communicate verbally
56. Communicates meaningful complex idea
57. Verbally loud
58. Talks to self
59. Difficult to understand

I. Attention

60. Does not concentrate on activity
61. Inattentive when other communicates to him
62. Incomplete communicative act

J. Internal Controls

63. Exhibits goal-directed activity
64. Shows planning in pursuing activity
65. Flexible in substituting goal
66. Products or activities have common theme
67. Perseverates in activity or task
68. Preoccupied with own thoughts
69. Unable to tolerate delay

K. Anxiety

70. Concerned about physical discomfort or physical danger
71. Seeks verbal reassurance
72. Hesitant in relating to adult
73. Hesitant in relating to child
74. Hesitant to try things on his own

L. Motor Behavior

75. Unusually good physical coordination
76. Poor physical coordination
77. Restlessness

M. Response to Frustration

78. Easily frustrated or threatened
79. Recovers quickly from frustration or threat

Response to Frustration (12 types of response are rated)

80. Becomes stubborn
81. Responds fearfully
82. Cries
83. Becomes dejected
84. Becomes angry
85. Becomes defiant, rebellious
86. Increased quietness
87. Increased activity that seems aimless
88. Seeks comfort from other
89. Retaliates against person who caused frustration
90. Ignores the frustration or threat
91. Effectively defends self

b.2. Taxonomy of Children's Interest
(Based on Gesell, 1946)

2 1/2 Years - Domestic play with doll or teddy bear and housekeeping toys.
Plays with cars or wagons.
Sand and water play. Makes pies and cakes with sand or mud. Tea parties with mud cakes and water tea. Soap bubble play.
Paints with some design, finger paints.
Makes pies or cakes of clay.
Blocks: vertical and horizontal building; names structures; may use large blocks as coal and lumber.

3 Years - Rides tricycle; pushes wagon, fire-engine, or train.
Locomotor toys, pattern toys.
Swings, plays on jungle gym.
Domestic play (both girls and boys) with doll, teddy bear and household equipment.
Plays with imaginary playmates.
Plays house, store, train with other children and simple equipment.
Colors with crayons as well as paint. May draw simple figures.
Plays in mud or sand: makes cakes, pies, roads, tunnels. Combines with other materials. Raw materials (beans, spools).
Blocks: builds structures, using a diversity of shapes and sizes. May combine blocks and train. Enjoys construction more than play with finished product.
Christmas: interest in Santa Claus; in presents received.

4 Years - Prefers to play with other children. Dramatic play of house, store, train, hospital involves costumes and "props." Combination of real and imaginative.
Rides tricycle; climbs, does "tricks." Locomotor toys, pattern toys.
Plays with imaginary companions.
Draws, paints, colors.
Admires own products whether of clay, paint, paper, blocks.
Still likes raw materials.
Blocks: makes detailed constructions. Combines with furniture for dramatic play. Builds cooperatively with others.
Christmas: asks for specific presents, then brags about size and amount. Strong interest in Santa Claus.
Television.

5 Years - More independent play; likes to play indoors or out according to season or weather. Likes to have an adult nearby.
Much play centers around a house. Builds house with large blocks or with draped furniture. Plays house, imitating adult activities.
Plays with dolls using them as babies.
Runs, climbs, swings, skips, jumps, dances.
Rides tricycle, pushes cart.
Tries roller skates, jump rope, even stilts.
Uses sand in making roads, transporting it in cars.
Imitative play: house, store, hospital.
Paints, draws, colors, cuts and pastes, does puzzles.
Copies letters and numbers.
Games of matching pictures and forms.
Builds with blocks, large and small. Likes to copy designs with blocks.
Christmas: asks for specific presents. May request things by letter to Santa Claus. Anxious to tell what he has received. Strong belief and interest in detail about Santa Claus and in visiting him.
Television.
Girls: doll play, playing house, dressing up.
Boys: blocks, tools, cars and trucks, war games, mechanical toys.

6 Years - Elaborates and expands five-year play interests.
Mud, sand, and water play.
Games of tag, hide-and-seek; stunts on trapeze, on rope, and on tricycle.
Ball play: tossing, bouncing, throwing.
Rough and tumble play, climbing, swinging.
Interest in roller skates, double runner ice skates.
Simple carpentry: hammering, sawing.
Table games with cards ("Go Fish"), anagrams, dominoes, and puzzles.
Paints, colors, draws, and uses clay. Cuts and pastes.
Collecting odds and ends.
Printing letters to spell real words.
Games of oral spelling or oral numbers.
Imaginative play: pretending to be a horse; pretending furniture is a boat, etc.
Blocks used imaginatively and constructively.
Television.
Christmas: may want specific toy (doll or train) and be disappointed if it is not received, but also wants many presents. Boasts and brags about how many received. Strong interest and belief in Santa Claus.
Girls: doll play elaborated with dolls' accessories: clothes, suitcase, furniture.
Dressing up in adult clothes.
Playing school, house, library.
Boys: tinker toys and simple erector sets.

(Continued)

War games, cowboys, cops and robbers.
Digging holes and tunnels and simple activity in garden.
Interest in transportation using wagon, trains, trucks, airplanes, and boats.

7 Years - More intense interest in some activities, fewer new ventures.
Has "mania" for certain activities: guns, funny books, or coloring.
More solitary play.
Some play with mud, and digging, and some interest in garden tools.
Tricycle usually discarded; some ride bicycles.
Magic and tricks. Jigsaw puzzles.
Collecting and swapping cards, bottle tops, and stowing away stones and bits of this and that.
Interest in swimming often strong.
Plays library, train, post office, with elaborate paraphernalia.
Rudiments of ball play: "catch," batting with soft ball.
Television.
Christmas: very great disappointment now if does not receive a requested toy. Writes letter to Santa Claus with list of desired toys.
Girls: cutting out paper dolls and their clothes. Doll play may decrease. May "invent" dresses for dolls.
Playing house, which includes dressing up in elaborate adult costumes.
Playing school with emphasis on teacher role.
Hopscotch and jump rope, roller skating, ball bouncing.
Boys: active outdoor play of running, wrestling, climbing trees.
Carpentry, especially sawing. Like to make Christmas presents.
Rigging things from cereal boxes, etc.
Make paper planes and shoot them; make model airplanes.
Cops and robbers, commandos, gun play, war play.
Building and playing in tree houses, forts, huts, and tents.
Beginning interest in chemistry, telegraphy, navigation.

8 Years - Variety of play interests. Prefer companionship in play (adult or child).
Games of all kinds played indoors or out. Differentiate work from play.
Table games of parchesi, checkers, dominoes, card games. Jigsaw puzzles and map puzzles. Scorns too simple games. May make up own game with own rules.
Dramatic play of giving shows; arranges and produces these shows.
"Gadget" age. Likes to have variety of things and tries to make something of them.

Collecting and arranging of collections.
Unorganized group play of wild running, chasing, wrestling.
Beginning interest in group games such as soccer or baseball with supervision.
Beginning of secret clubs, usually short-lived.
Seasonal interests: rowing and swimming in summer; skating, sledding, skiing in winter; playing with marbles, kites, and tops in spring.
Boys and girls begin to separate in play.
Television.
Christmas: has innumerable ideas of what would like for Christmas and wants are now intense. Interest in how many presents received. Does not want useful things. More interest than earlier in giving presents.
Girls: doll play and playing house, stressing more complex adult relationships.
In make-believe play, child requires complete attention of companion.
Paper doll play: collects large number of dolls and doll clothes. Cuts out and tries on dresses; likes to have them admired.
Simple dramatic play with dolls involving much verbalization. Likes books with many different dolls.
Boys: beginning to utilize tools to fix things around house; make mixtures with chemistry set. Use telegraph to communicate.
Continue to work with airplane, train, and boat models.
War games, cops and robbers, commandos.
Electric trains and movie projectors.

b.3. Contextual Differentiations

Appraiser x Object Combinations

Key: *Important
✓Feasible
?Questionable

Object	Appraiser of child's behavior: Target child						Appraiser of child's behavior: Mother					
	Grade						Grade					
	K-2	K-1	K	1	2	3	K-2	K-1	K	1	2	3
1. Self	?	?	?	*	*	*	*	*	*	*	*	*
2. Mother	?	?	?	✓	✓	✓	*	*	*	*	*	*
3. Father	?	?	?	✓	✓	✓	*	*	*	*	*	*
4. Teacher	?	?	?	*	*	*	*	*	*	*	*	*
5. Tester	?	?	?	?	?	?						
6. Female peer	?	✓	✓	*	*	*	*	*	*	*	*	*
7. Male peer	?	✓	✓	*	*	*	*	*	*	*	*	*
8. Sibling (older)	?	?	?	✓	✓	✓	*	*	*	*	*	*
9. Group	?	?	?	✓	✓	✓	?	?	?	?	?	?
10. Concept	?	?	?	*	*	*	*	*	*	*	*	*
11. Others (attitude toward school)	?	?	?	*	*	*	*	*	*	*	*	*

b_3-2

Appraiser x Object Combinations

Key *Important
✓Feasible
?Questionable

Object	Appraiser of child's behavior: Father						Appraiser of child's behavior: Teacher					
	Grade						Grade					
	K-2	K-1	K	1	2	3	K-2	K-1	K	1	2	3
1. Self	*	*	*	*	*	*	*	*	*	*	*	*
2. Mother	*	*	*	*	*	*	?	?	?	?	?	?
3. Father	*	*	*	*	*	*	?	?	?	?	?	?
4. Teacher	✓	✓	✓	✓	✓	✓	*	*	*	*	*	*
5. Tester												
6. Female peer	✓	✓	✓	✓	✓	✓	*	*	*	*	*	*
7. Male peer	✓	✓	✓	✓	✓	✓	*	*	*	*	*	*
8. Sibling (older)	*	*	*	*	*	*	?	?	?	?	?	?
9. Group	?	?	?	?	?	?	*	*	*	*	*	*
10. Concept	✓	✓	✓	✓	✓	✓	*	*	*	*	*	*
11. Others (attitude toward school)	*	*	*	*	*	*	*	*	*	*	*	*

Appraiser x Object Combinations

Key: *Important
✓Feasible
?Questionable

Object	Appraiser of child's behavior: Tester						Appraiser of child's behavior: Trained observer					
	Grade						Grade					
	K-2	K-1	K	1	2	3	K-2	K-1	K	1	2	3
1. Self	*	*	*	*	*	*	*	*	*	*	*	*
2. Mother	?	?	?	?	?	?	*	*	*	*	*	*
3. Father	?	?	?	?	?	?	?	?	?	?	?	?
4. Teacher	?	?	?	?	?	?	*	*	*	*	*	*
5. Tester	*	*	*	*	*	*	*	*	*	*	*	*
6. Female peer	?	?	?	?	?	?	*	*	*	*	*	*
7. Male peer	?	?	?	?	?	?	*	*	*	*	*	*
8. Sibling (older)	?	?	?	?	?	?	?	?	?	?	?	?
9. Group	?	?	?	?	?	?	*	*	*	*	*	*
10. Concept	?	?	?	*	*	*	*	*	*	*	*	*
11. Others (attitude toward school)	?	?	?	*	*	*	*	*	*	*	*	*

Appraiser x Object Combinations

Key: *Important
✓Feasible
?Questionable

Object	Appraiser of child's behavior: Female peer						Appraiser of child's behavior: Male peer					
	Grade						Grade					
	K-2	K-1	K	1	2	3	K-2	K-1	K	1	2	3
1. Self	?	?	?	?	?	?	?	?	?	?	?	?
2. Mother	?	?	?	?	?	?	?	?	?	?	?	?
3. Father	?	?	?	?	?	?	?	?	?	?	?	?
4. Teacher	?	?	?	✓	✓	✓	?	?	?	✓	✓	✓
5. Tester												
6. Female peer	?	✓	✓	*	*	*	?	✓	✓	*	*	*
7. Male peer	?	✓	✓	*	*	*	?	✓	✓	*	*	*
8. Sibling (older)	?	?	?	?	?	?	?	?	?	?	?	?
9. Group	?	✓	✓	*	*	*	?	✓	✓	*	*	*
10. Concept	?	?	?	✓	✓	✓	?	?	?	✓	✓	✓
11. Others (attitude toward school)	?	?	?	✓	✓	✓	?	?	?	✓	✓	✓

Appraiser x Object Combinations

Key: *Important
✓Feasible
?Questionable

Object	Appraiser of child's behavior: Sibling (older) Grade K-2	K-1	K	1	2	3	Appraiser of child's behavior: Group Grade K-2	K-1	K	1	2	3
1. Self	✓	✓	✓	✓	✓	✓	?	✓	✓	✓	✓	✓
2. Mother	✓	✓	✓	✓	✓	✓	?	?	?	?	?	?
3. Father	✓	✓	✓	✓	✓	✓	?	?	?	?	?	?
4. Teacher	✓	✓	✓	✓	✓	✓	?	✓	✓	✓	✓	✓
5. Tester												
6. Female peer	✓	✓	✓	✓	✓	✓	?	✓	✓	*	*	*
7. Male peer	✓	✓	✓	✓	✓	✓	?	✓	✓	*	*	*
8. Sibling (older)	*	*	*	*	*	*	?	?	?	?	?	?
9. Group	✓	✓	✓	✓	✓	✓	?	✓	✓	*	*	*
10. Concept	✓	✓	✓	✓	✓	✓	?	✓	✓	✓	✓	✓
11. Others (attitude toward school)	✓	✓	✓	✓	✓	✓	?	✓	✓	✓	✓	✓

Appraiser x Setting Combinations

Key: *Important
√Feasible
?Questionable

Appraiser of child's behavior:
Target child

Setting	Grade K-2	K-1	K	1	2	3
1. Home	?	?	?	√	√	√
2. Classroom	?	?	?	*	*	*
3. School, non-classroom	?	?	?	√	√	√
4. Test situation	?	?	?	√	√	√
5. Community	?	?	?	?	√	√

Appraiser of child's behavior:
Mother

Setting	Grade K-2	K-1	K	1	2	3
1. Home	*	*	*	*	*	*
2. Classroom	√	√	√	√	√	√
3. School, non-classroom	√	√	√	√	√	√
4. Test situation						
5. Community	*	*	*	*	*	*

Appraiser x Setting Combinations

Key: *Important
✓Feasible
?Questionable

Appraiser of child's behavior:
Father

Setting	Grade K-2	K-1	K	1	2	3
1. Home	*	*	*	*	*	*
2. Classroom	✓	✓	✓	✓	✓	✓
3. School, non-classroom	✓	✓	✓	✓	✓	✓
4. Test situation						
5. Community	✓	✓	✓	✓	✓	✓

Appraiser of child's behavior:
Teacher

Setting	Grade K-2	K-1	K	1	2	3
1. Home	?	?	?	?	?	?
2. Classroom	*	*	*	*	*	*
3. School, non-classroom	*	*	*	*	*	*
4. Test situation				?	?	?
5 Community	?	?	?	?	?	?

Appraiser x Setting Combinations

Key: *Important
✓Feasible
?Questionable

Appraiser of child's behavior:
Tester

Setting	Grade K-2	K-1	K	1	2	3
1. Home						
2. Classroom	?	?	?	?	?	?
3. School, non-classroom	?	?	?	?	?	?
4. Test situation	*	*	*	*	*	*
5. Community						

Appraiser of child's behavior:
Trained observer

Setting	Grade K-2	K-1	K	1	2	3
1. Home	?	?	?	?	?	?
2. Classroom	*	*	*	*	*	*
3. School, non-classroom	✓	✓	✓	✓	✓	✓
4. Test situation	*	*	*	*	*	*
5. Community	?	?	?	?	?	?

Appraiser x Setting Combinations

Key: *Important
✓Feasible
?Questionable

Appraiser of child's behavior:
Female peer

Setting	Grade K-2	K-1	K	1	2	3
1. Home	?	?	?	?	?	?
2. Classroom	?	✓	✓	*	*	*
3. School, non-classroom	?	✓	✓	*	*	*
4. Test situation						
5. Community	?	?	?	?	✓	✓

Appraiser of child's behavior:
Male peer

Setting	Grade K-2	K-1	K	1	2	3
1. Home	?	?	?	?	?	?
2. Classroom	?	✓	✓	*	*	*
3. School, non-classroom	?	✓	✓	*	*	*
4. Test situation						
5. Community	?	?	?	?	✓	✓

Appraiser x Setting Combinations

Key: *Important
√Feasible
?Questionable

Appraiser of child's behavior:
Sibling (older)

Setting	Grade K-2	K-1	K	1	2	3
1. Home	√	√	√	√	√	√
2. Classroom	√	√	√	√	√	√
3. School, non-classroom	√	√	√	√	√	√
4. Test situation						
5. Community	√	√	√	√	√	√

Appraiser of child's behavior:
Group

Setting	Grade K-2	K-1	K	1	2	3
1. Home	?	?	?	?	?	?
2. Classroom	?	√	√	*	*	*
3. School, non-classroom	?	√	√	*	*	*
4. Test situation						
5. Community	?	?	?	?	√	√

Setting Structure x Affect Combinations

Key: *Important
✓ Feasible
?Questionable

Setting in which behavior occurs:
Home

Setting Type	Grade K-2	K-1	K	1	2	3
Structured-positive	?	?	?	?	?	?
Structured-neutral	?	?	?	?	?	?
Structured-threatening	?	?	?	?	?	?
Unstructured-positive	?	?	?	?	?	?
Unstructured-neutral	?	?	?	?	?	?
Unstructured-threatening	?	?	?	?	?	?

Setting in which behavior occurs:
Classroom

Setting Type	Grade K-2	K-1	K	1	2	3
Structured-positive	?	?	?	?	?	?
Structured-neutral	?	?	?	?	?	?
Structured-threatening	?	?	?	?	?	?
Unstructured-positive	?	?	?	?	?	?
Unstructured-neutral	?	?	?	?	?	?
Unstructured-threatening	?	?	?	?	?	?

Setting Structure x Affect Combinations

Key: *Important
✓Feasible
?Questionable

Setting in which behavior occurs:
School, non-classroom

Setting Type	K-2	K-1	Grade K	1	2	3
Structured-positive	?	?	?	?	?	?
Structured-neutral	?	?	?	?	?	?
Structured-threatening	?	?	?	?	?	?
Unstructured-positive	?	?	?	?	?	?
Unstructured-neutral	?	?	?	?	?	?
Unstructured-threatening	?	?	?	?	?	?

Setting in which behavior occurs:
Test situation

Setting Type	K-2	K-1	Grade K	1	2	3
Structured-positive	*	*	*	*	*	*
Structured-neutral	*	*	*	*	*	*
Structured-threatening	*	*	*	*	*	*
Unstructured-positive	*	*	*	*	*	*
Unstructured-neutral	*	*	*	*	*	*
Unstructured-threatening	*	*	*	*	*	*

Setting Structure x Affect Combinations

Key: *Important
✓Feasible
?Questionable

Setting in which behavior occurs:
Community

Setting Type	K-2	K-1	Grade K	1	2	3
Structured-positive	?	?	?	?	?	?
Structured-neutral	?	?	?	?	?	?
Structured-threatening	?	?	?	?	?	?
Unstructured-positive	?	?	?	?	?	?
Unstructured-neutral	?	?	?	?	?	?
Unstructured-threatening	?	?	?	?	?	?

APPENDIX c

Encyclopedia of Proposed Measures, by Title

Name of Measure: Analysis of Visually Perceived Forms (Birch & Lefford)

Variables Measured: form analysis

Status	Age-Grade Level					
	3½	4½	K	Gr.1	Gr.2	Gr.3
Ready to Go		X	X	X	X	X
In Development						

Data Collection Method: ___ Group Test ___ Interview
X Individual Test ___ Observation

Estimated Administration Time (min.): 10 minutes

Brief Statement of Procedure: S is presented with model card on which is whole geometric form. Test card with segment of form is placed above model card. E, pointing to test card, says "Show me these lines on this card" (pointing to model card). S is asked to trace part with finger.

Minimum Requirements for the Administrator-Observer: No special requirements.

Supporting Statement: The measure is included for its ability to distinguish brain damaged from normal children. It can also be used as a diagnostic instrument in analyzing failure in reading and writing.

Relation of age to visual analytic performance

	Mean	SD	N	
Age 5	8.6	2.4	23	
6	10.1	1.2	25	
7	10.1	1.6	28	Max. = 12
8	11.4	0.9	20	
9	11.2	1.0	17	

Significance of difference between age levels

5 year group vs. 6 year group

Difference between means: t = 2.71 (Sig. beyond .01)
Difference in variance: F = 4.0 (Sig. beyond .001)

5 year group vs. 9 year group

Difference between means: t - 4.10 (Sig. beyond .001)
Difference in variance: F - 5.76 (Sig. beyond .001)

Difference between normal and cerebral-palsied children in ability to analyze visual percepts

Age	Normal	C-P
5	3.8	1.2
6	4.4	2.4
7	4.5	2.6
8	5.4	3.3
9	5.2	2.4
10	5.4	3.8
11	5.7	2.4

Max. = 6

Birch, H. G., & Lefford, A. Two strategies for studying perception in "brain-damaged" children. In H. G. Birch (Ed.), Brain damage in children. Baltimore: Williams and Wilkens, 1964.

Birch, H. G., & Lefford, A. Visual differentiation, intersensory integration, and voluntary motor control. Monographs of Society for Research in Child Development, 1967, 32 (2).

Maccoby, E. What copying requires. Paper presented at the APA Symposium, Washington, D.C., 1967.

Name of Measure: Animal House: WPPSI

Variables Measured: Sign-symbol association ability

Status	Age-Grade Level					
	3½	4½	K	Gr.1	Gr.2	Gr.3
Ready to Go		X	X			
In Development						

Data Collection Method:

___ Group Test
___ Interview
X Individual Test
___ Observation

Estimated Administration Time (min.): 7-8 minutes

Brief Statement of Procedure: After demonstration, and according to key at top of board, child must place colored cylinders in holes corresponding to animal pictures. ("Here is a dog. He lives in a black house.", etc.)
Score is based on time and number of errors.

Minimum Requirements for the Administrator-Observer: Ability to relate with children, follow moderately complex directions, time accurately, and accurately record errors.

Supporting Statement: The Animal-House subtest of the WPPSI is a complex test. Optimum performance on this test requires memory, speed, at least moderate dexterity, ability to maintain attention, and to understand and follow directions. The contamination-corrected correlations of the Animal-House subtests with the Verbal, Performance, and Full Scale scores on the WPPSI are approximately .48, .51, and .55 respectively (average of correlations at ages 4, 4½, 5, and 5½ calculated from data in WPPSI manual).

The Animal-House subtest is one of three performance subtests of the WPPSI included in the study. As with the other two subtests (Block Design and Picture Completion), there are available national norms for comparison purposes. In addition to the Peabody Picture Vocabulary Test, the Caldwell Preschool Inventory, and other standardized measures, these three performance tests will permit comparison of the disadvantaged samples with normative samples.

Name of Measure: Apgar Score, available from hospital records, as is birth weight and height. Child's weight and height available from school records (?)
Variables Measured: Birth condition, height, and weight

Status	Age-Grade Level					
	3½	4½	K	Gr.1	Gr.2	Gr.3
Ready to Go	X	X	X	X	X	X
In Development						

Data Collection Method: ___ Group Test ___ Interview __X__ Other
___ Individual Test ___ Observation

Estimated Administration Time (min.): Requires no testing time.

Brief Statement of Procedure: Obtain records.

Minimum Requirements for the Administrator-Observer:

Supporting Statement: Predictive of intellectual and social function variables.

Name of Measure: Auditory Discrimination Test (Wepman)

Variables Measured: Auditory discrimination

Status	Age-Grade Level					
	3½	4½	K	Gr.1	Gr.2	Gr.3
Ready to Go			X	X	X	X
In Development						

Data Collection Method:

____ Group Test

____ Interview

X Individual Test

____ Observation

Estimated Administration Time (min.): 5 minutes

Brief Statement of Procedure: E reads pairs of words to S; S indicates whether the members of each pair are the same or different.

Minimum Requirements for the Administrator-Observer: No special requirements beyond acceptable articulation skills.

Supporting Statement: Precursor to listening skills required in the classroom. See section on verbal and quantitative skills.

Name of Measure: Auditory Screening

Variables Measured: Audition: air and bone conduction

Status	Age-Grade Level					
	$3\frac{1}{2}$	$4\frac{1}{2}$	K	Gr.1	Gr.2	Gr.3
Ready to Go	X	X	X	X	X	X
In Development						

Data Collection Method: ___ Group Test ___ Interview

X Individual Test ___ Observation

Estimated Administration Time (min.): 5-10 minutes

Brief Statement of Procedure: See attached report forms.

Minimum Requirements for the Administrator-Observer: Examiner trained by an audiologist

Supporting Statement:

Auditory Screening

Record the letter P if subject passes; enter observed decibels if a higher threshold is obtained.

Air Conduction

20 db.

Right					Left				
500	1000	2000	4000	6000	500	1000	2000	4000	6000

Bone Conduction

20 db.

Right					Left				
500	1000	2000	4000	6000	500	1000	2000	4000	6000

Name of Measure: Block Design: WPPSI and WISC

Variables Measured: Analytical functioning

Status	Age-Grade Level					
	$3\frac{1}{2}$	$4\frac{1}{2}$	K	Gr.1	Gr.2	Gr.3
Ready to Go		X	X	X	X	X
In Development						

Data Collection Method: ___ Group Test ___ Interview
X Individual Test ___ Observation

Estimated Administration Time (min.): 5-10 minutes

Brief Statement of Procedure: S must reproduce geometric designs which are either demonstrated by E or presented pictorially.

Minimum Requirements for the Administrator-Observer: Ability to relate with S and follow specified standard procedures. No special education required.

Supporting Statement: The Block Designs subtest of the Wechsler Preschool and Primary Scale of Intelligence (WPPSI) probably measures at least two aspects of intellectual functioning--figural articulation and analytical functioning. It is a downward extension of the subtest of the same name in the WAIS and WISC. Factor-analytic studies (Cohen, 1957; 1959; Goodenough & Karp, 1961; Karp, 1963) have demonstrated that the Block Designs subtest loads an "analytical functioning" factor in the Wechsler scales. Recent studies (Witkin, personal communication; Witkin, Faterson, Goodenough, & Birnbaum, 1966) reported that, among subjects classified by authorities as mildly retarded, a startling number of individuals whose "verbal comprehension" factor (Vocabulary, Information, Verbal Comprehension) scores are quite low, but who have near normal prorated IQs on the "analytical" factor (Block Designs, Picture Completion, Object Assembly). In mentally retarded boys in special public school classes, the mean prorated IQ difference between the "verbal comprehension" and "analytical" factors was 13 points; in institutionalized mentally retarded boys the corresponding disparity was 20 points. In view of the often poor performance of culturally disadvantaged children in school,

and in view of the apparent importance of verbal functioning as opposed to analytical functioning in determining the application of the "retarded" label with all its implications, it is clear that measures of the "verbal comprehension" and "analytical functioning" factors should be obtained separately. In addition to the above, much of the argument for including the portable rod-and-frame test also applies to Block Designs.

The WPPSI Block Designs subtest has been standardized on stratified random samples down to age 4. It is proposed that it be administered to this disadvantaged sample at age $4\frac{1}{2}$ and to a subset of the sample at $3\frac{1}{2}$ in order to get some appreciation of the growth of the ability to perform on this task.

Cohen, J. The factor structure of the WAIS between early adulthood and old age. Journal of Consulting Psychology, 1957, 21, 283-290.

Cohen, J. The factorial structure of the WISC at ages 7-6, 10-6, and 13-6. Journal of Consulting Psychology, 1959, 23, 285-299.

Goodenough, D. R., & Karp, S. A. Field dependence and intellectual functioning. Journal of Abnormal and Social Psychology, 1961, 63, 241-246.

Karp. S. A. Field dependence and overcoming embeddedness. Journal of Consulting Psychology, 1963, 27, 294-302.

Witkin, H. A., Faterson, H. F., Goodenough, D. R., & Birnbaum, J. Cognitive patterning in mildly retarded boys. Child Development, 1966, 37, 301-316.

Name of Measure: Blood Test

Variables Measured: Hemoglobin content and/or hematocrit percentage, white blood cell count

Status	Age-Grade Level					
	3½	4½	K	Gr.1	Gr.2	Gr.3
Ready to Go	X	X	X	X	X	X
In Development						

Data Collection Method:

___ Group Test

___ Interview

X Individual Test

___ Observation

Estimated Administration Time (min.): 2 minutes

Brief Statement of Procedure: Sample of blood from finger or ear lobe

Minimum Requirements for the Administrator-Observer: laboratory technician or nurse

Supporting Statement: Test for anemia as a cause of lethargy and high incidence of respiratory infection. Also test for other hidden infection.

Name of Measure: Brown IDS Self Concept **Referents Test**

Variables Measured: **Self-concept, including perception of others' (teacher, peers) perceptions of S.**

Status	Age-Grade Level					
	3½	4½	K	Gr.1	Gr.2	Gr.3
Ready to Go	X	X	X	X	X	X
In Development						

Data Collection Method:

____ Group Test

____ Interview

_X_ Individual Test

____ Observation

Estimated Administration Time (min.): **15 minutes**

Brief Statement of Procedure: See **Attached Sheet**

Minimum Requirements for the Administrator-Observer: **Ability to establish rapport with young child and to follow standardized instructions; no special education required.**

Supporting Statement: See Attached Sheets

Brief Statement of Procedure: To induce the young child to take the role of another toward himself, a full-size colored photograph is taken of each S against a standard, preferably neutral light-colored background, with standardized instructions for posing. Since there is need for immediate availability of the photograph, a Polaroid camera is used, equipped with a "wink" flash unit, which produces completely developed 3" x 4" prints within fifteen seconds after exposure. After taking the photograph Ss are asked to report: 1) their perception of the ways in which they suppose they are seen by each of the "significant other" referents and their perceptions of themselves. A core of 14 bipolar adjectival items constitutes the dimensions on which Ss must report both their own perceptions and their perceptions of others' perceptions of them. These items are stated in the vocabulary of 4-year-old children. All items are presented in an "either-or" item format, the more socially desirable choice being scored "1" while the less socially desirable choice is scored "0". These items are given as follows:

	Item	Score
1.	Happy-sad	1, 0
2.	Clean-dirty	1, 0
3.	Good looking-ugly	1, 0
4.	Likes to play with other kids-doesn't like to play with other kids	1, 0
5.	Likes to have own things-likes to have other kids' things	1, 0
6.	Good-bad	1, 0
7.	Likes to talk a lot-doesn't like to talk a lot	1, 0
8.	Smart-stupid	1, 0
9.	Not scared of a lot of things-scared of a lot of things	1, 0
10.	Not scared of a lot of people-scared of a lot of people	1, 0
11.	Likes the way clothes look-doesn't like the way clothes look	1, 0
12.	Strong-weak	1, 0
13.	Healthy-sick	1, 0
14.	Likes the way (my) face looks-doesn't like the way (my) face looks	1, 0

After the E has obtained a response indicating that S knows that it is he in the photograph, Ss are asked to report their perceptions of themselves and their perceptions of their teachers' and peers' perceptions of them on each of these items. The set of items is thus repeated three times and the only factor which is varied is the referent against which the items are cast. Each question is asked with specific reference to the photograph which has been taken of S. Thus, as E asks each question he points to the picture of S, directing S's attention to the photograph of himself. The procedure yields a "self as subject" score, "self as object" score, and scores for each of the referents taken singly. The "object" score is obtained by summing across the teacher and peer referents.

Since data with children 3-6 to 4-6 indicate that many children have difficulty understanding the difference between self and other referents, at age 3½ only the first part of the test will be administered; i.e., perception of self.

Supporting Statement: In contrast to the numerous studies of language development and cognitive functioning, there are very few studies of the emergence and development of self-concept in young children (Wiley, 1961). A recent exception is Brown's (1966) development of a technique for assessing self-concept using the child's Polaroid photograph. Thirty-eight Negro (lower class) and thirty-six white (middle class) preschool children responded to 14 bi-polar questions which were repeated for each of their mothers', teachers', and"other kid's" perceptions of themselves. The self-perceptions of the Negro children were significantly less favorable than those of white children. Negro children also perceived their teachers as viewing them in a less favorable light than did white children. However, Negro and white children did not differ in either their perceptions of their mothers' or peers' evaluation of them. Brown has since reported (1967) replication of these findings with similar subsamples.

The findings of Ozenhosky, Barz, Clark and O'Leary, (1967) indicate, however, that self-perception responses to pictorial stimuli may be different from those made to verbal material covering the same content. They developed a non-verbal self-concept instrument (U-Scale) derived from McCandless' (1961) conceptualization of the self-concept as a "set of expectancies, plus evaluations of the areas or behaviors with reference to which these expectancies are held." The U-Scale indexes children's self-evaluations indirectly by means of a U-figure which is depicted in a positive and negative situation in each plate. The child is asked to indicate, by pointing, whether the positive drawing; e.g., U being rewarded by the teacher, or the negative drawing, U being rebuked by the teacher, "is the real U?" The 50 plates illustrate positive and negative dimensions of physique, appearance, and sex-role preferences; competence at home, in school, and at play; interpersonal relations with peers, older and younger children, and adults. The separate forms for boys and girls contain the same items, but the sex of the U-figure and that of the other protagonists differ. The subjects were 95 Negro and 52 white children enrolled in a half-day pre-school program maintained by a public school district in a suburban school district in New York State. The self-concepts of the Negro children were not significantly different from those of the white children who were significantly superior to the Negro children in vocabulary scores.

Unfortunately, however, the authors of this study do not know how representative their samples were. Moreover, as with many so-called non-verbal measures, the format relies heavily on the child's understanding of the concepts involved. In addition, the materials seem less intrinsically appealing to the young child.

Consequently, for the present study the Brown task was chosen since it is one of the few measures in the literature relating to the child's evaluation of "self as object" and "self as subject" which has reliability data and evidence of validity for use with 4-year-old disadvantaged children. Moreover, it is relatively unconfounded by complex verbal directions, is easily administered, does not make sustained attention demands on the young child and has built in characteristics to appeal to a youngster.

Utilizing Mead's notion of the evolvment of self concept from one's perception of salient others' perception of self we may observe the development of the young child's positive and negative conceptions of self as they interrelate with data on specific teacher-child, peer-child and parent-child interaction behaviors. It was recently used in a subsample of the national evaluation of Full Year 67-68 Head Start programs and preliminary data suggest its fruitfulness in contributing to understanding of the child's performance in other contexts.

As a final comment, it should be noted that despite differences in method, sample and variance in results, both Brown (1966) and Clark et al (1967) found in the preschool programs studied that self-concept scores of both Negro and white children were positively skewed. As Clark et al (1967) suggest, the repeated emphasis on the "negative self-image" of Negro preschool children in educational literature may need tempering less it receive a spurious validation in the preschool classroom by becoming a self-fulfilling prophecy.

Brown, B. The assessment of self-concept among four-year old Negro and white children: a comparative study using the Brown-IDS self-concept referents test. Paper presented at the Eastern Psychological Association Meeting, New York City, April 1966.

_____ Personal communication, 1967

Clark, E. T., Ozenhosky, R. J., Barz, A. I., & O'Leary, J. V. Self-concept and vocabulary development in Negro and white preschool children Paper presented at the Eastern Psychological Association meeting, April, 1967.

McCandless, B. Children and Adolescents, New York: Holt, Rinehart and Winston, 1961.

Wiley, Ruth C. The Self-Concept. Lincoln: University of Nebraska Press, 1961.

Name of Measure: Center Facilities and Resources Inventory

Variables Measured: Head Start facilities and resources

Status	Age-Grade Level					
	3½	4½	K	Gr.1	Gr.2	Gr.3
Ready to Go						
In Development						

Head Start Director

X

Data Collection Method:

____ Group Test

____ Interview

__X__ Individual Test

____ Observation

Estimated Administration Time (min.): 30-60 minutes

Brief Statement of Procedure: The instrument provides descriptive information about the physical facilities and human and program resources available to a Head Start center, as well as about the children served. Administered in booklet form.

Minimum Requirements for the Administrator-Observer:

Supporting Statement: The descriptions provided by this instrument will be used to answer the questions: (1) Do study Head Start centers within each site differ? (2) Do study Head Start centers between sites differ?

Boyd, J. L. Facilities and resources of Head Start centers, Section two: Project Head Start summer 1966. Final report to the U.S. Office of Economic Opportunity, No. OEO - 1359. Princeton, N. J.: Educational Testing Service, 1966.

Name of Measure: Child and Family Medical History Report Form

Variables Measured: Family medical history, subject medical history* and past and current behavior

Status	Age-Grade Level					
	$3\frac{1}{2}$	$4\frac{1}{2}$	K	Gr.1	Gr.2	Gr.3
Ready to Go In Development	X	X	X	X	X	X

Data Collection Method: ____ Group Test ____x____ Interview
____ Individual Test ____ Observation

Estimated Administration Time (min.): 10-15 minutes

Brief Statement of Procedure: May be administered in the home or at testing center while child is otherwise engaged

Minimum Requirements for the Administrator-Observer: Interviewer-Aide--one who can translate question to parent(s) but who has sufficient medical background to interpret responses.

Supporting Statement:

*Apgar score to be obtained from hospital records, if available.

Apgar, V., & James, L. S. Further observations on the newborn scoring system. American Journal of Diseases of Children, 1962, 104, 419-428.

Name of Measure: Children's Auditory Discrimination Inventory (Stern)

Variables Measured: Auditory discrimination

Status	Age-Grade Level					
	$3\frac{1}{2}$	$4\frac{1}{2}$	K	Gr.1	Gr.2	Gr.3
Ready to Go	X	X				
In Development						

Data Collection Method: ___ Group Test ___ Interview
_X_ Individual Test ___ Observation

Estimated Administration Time (min.): 15 minutes

Brief Statement of Procedure: S is shown two pictures which are orally labeled for him. S is then presented with one of the oral labels and asked to point to its pictorial match.

Minimum Requirements for the Administrator-Observer: No special requirements.

Supporting Statement: Precursor to listening skills required in the classroom. See section on verbal and quantitative skills.

Name of Measure: Children's Drawings (Landes)

Variables Measured: Art production: originality, picture content

Status	Age-Grade Level					
	$3\frac{1}{2}$	$4\frac{1}{2}$	K	Gr.1	Gr.2	Gr.3
Ready to Go						
In Development			X	X	X	X

Data Collection Method: X Group Test ___ Interview
___ Individual Test ___ Observation

Estimated Administration Time (min.): 15

Brief Statement of Procedure: (See following pages)

Minimum Requirements for the Administrator-Observer: The classroom teacher can set up and assign this task as part of the regular "art period." The drawings, however, should be scored by graduate art education students who have received special training in the rating procedure.

Supporting Statement: In the psychological literature, "creativity" in school children has been applied primarily to verbal output. On the other hand, popular (including educational) views of creativity are much broader. The introduction of this task into the study takes account, if only partially, of the broader definition. In addition, it serves as one measure of achievement in art production, an area stressed ("overstressed" according to many critics) in the curriculum of most early school programs. Art products over several years of the study will provide tangible developmental evidence which can be considered in relationship to speech and writing samples.

Brief Statement of Procedure: All children will be asked to draw a picture of themselves. Then, after a standard stimulus, they will be asked to draw another picture. Three types of motivation (visual, aural, and kinesthetic) are recommended as stimuli. Each S will be provided with the same sized paper and the same number and color of crayons. The Ss drawings of themselves will be classified according to specified stages of drawing development: scribbling, preschematic, schematic, etc. A scale is currently being developed for the rating of artistic originality in the drawing using the stimulus motivation. This scale will be a composite of previous research on descriptive scales for art products. In addition, the drawings will be subjected to a content analysis; e.g., the number of different colors used, the subject depicted.

Stimuli: The recommended visual stimulus is a slide printed out-of-focus so that the objects are non-identifiable but a variety of colors, shapes, lines and values are still evident. (Possible slides: a small section of a garden with flowers in a variety of types and colors; a turtle on a rock in a pond, showing a variety of light and dark; a zoo scene for a variety of size and placement; a street scene showing differences between organic and inorganic shapes.) The children will be asked to guess what they think the picture is and to draw it. They will only see the slide for a minute or two. It will not be visible while the children are drawing.*

The recommended aural stimulus is a tape recording or short record of a non-identifiable sound which varies in intensity, pitch, timbre, and pace. (Possible sounds: footsteps in leaves going slowly, running, and shuffling; a swimmer in water with various strokes and speeds; a motor or drill with changing momentum; water or wind sounds on glass.) The children will be asked to guess what they think the sound is and to draw a picture of it.*

The recommended kinesthetic stimulus is an activity that each child would actually experience. (Possible activities: going down the slide; swinging; riding on a merry-go-round; riding on a tricycle; running a race.) Before the activity, the children will be instructed to pay attention to all that happens when they swing (sights, sounds, feelings). They will be asked to draw how it "feels" to go swinging.

Advantages of the stimuli presentations are: parallel forms for different age groups are possible; they are easy to produce and distribute to the classroom teachers; they are easy for the classroom teacher to administer as part of her regular art period; and, the success of the motivation is not dependent upon the ability and enthusiasm of the classroom teacher.

*Warm-up exercises may be necessary before the slides or tape recordings are presented. The children must understand that they are supposed to "guess" or "imagine" what the picture and sounds represent; various approaches will be field tested.

Supplies and Equipment: The supplies for each child should be distributed before any motivations or instructions. These will include white paper (approximately 11" x 17"), crayons which are not paper wrapped (red, orange, yellow, green, blue, violet, brown, and black). The classroom teacher will need a slide projector or a tape recorder (possibly a record player), and copies of the stimulus material and test instructions.

Scoring Procedures: All drawings will be rated by graduate art education students trained in the specific scoring procedures.

1. Draw a Picture of Yourself"

The children's drawings of themselves could be classified according to Lowenfeld's Drawing Stages. Lowenfeld separates children's drawings into several stages: scribbling, preschematic, schematic, dawning realism, and pseudo-naturalistic (covering ages 2 - 13). The definition of each stage is based upon the observation of specific drawing characteristics relative to age. These characteristics include the child's basic approach to drawing, the representation of the human figure, and the use of space, color, and design. This classification, or a similar scheme, can be used to compare the drawing level of study subjects to their classmates, their non-Head Start counterparts, and to other children generally. This analysis will also provide a means of identifying those children who can only scribble. (Stimulus drawings should be viewed as "abstract" only if a child is past the scribbling stage.) The Goodenough "Draw a Person" score might also be obtained from this drawing.

2. Stimuli Drawings (for any of the three motivations)

Content Analysis: This approach, although not usually associated with an analysis of artistic works, can provide much descriptive information by cataloging the various attributes of each child's drawing. Details which will be considered are: the number of different colors used, the size of the figures, the type of subject depicted, the characteristics of the figures, etc.

Rating Scale: The stimulus drawings will be scored by trained raters using a scale which will be a composite of Eisner, Rouse, Mussen, and Torrance research. Tentatively this will be a five-point scale for rating various specified dimensions which are generally acknowledged as definitive of creative drawing. A rough example of this approach is as follows:

	5	4	3	2	1	
High fluency						Low fluency*
High flexibility						Low flexibility*
High originality (approach)						Low originality*
High originality (subject)						Low originality*
High elaboration						Low elaboration*

A child's score would be the sum of the rating given on each dimension.

*These terms are defined as:
Fluency - how many objects, items, people were drawn;
Flexibility - how many different objects, items, people were drawn;
Originality - something was drawn, or drawn in a way that others had not done;
Elaboration - how many details were present on each object, item or person.

References:

Eisner, Elliott W. A Comparison of the Developmental Drawing Characteristics of Culturally Advantaged and Culturally Disadvantaged Children. (Final report to the U.S. Office of Education, ED 015 783.) Washington, D.C.: U.S. Government Printing Office, 1966.

Lowenfeld, Viktor, and Brittain, W. Lambert. Creative and Mental Growth. New York: The Macmillan Company, 1964.

Mussen, Paul. Criteria for Evaluation of Children's Artistic Creativity. (Final report to the U.S. Office of Education, ED 013 368.) Washington, D.C.: U.S. Government Printing Office, 1966.

Rouse, Mary J. "The Development of a Descriptive Scale for Art Products." The Bulletin of the School of Education. Bloomington, Indiana: Indiana University, January, 1968.

Torrance, E. Paul. Torrance Tests of Creative Thinking. Princeton, New Jersey: Personnel Press, Inc., 1966.

Wallach, Michael A., and Kogan, Nathan. Modes of Thinking in Young Children. New York: Holt, Rinehart and Winston, Inc., 1965.

Name of Measure: Children's Embedded Figures Test

Variables Measured: Analytical functioning (field dependence-independence)

Status	Age-Grade Level					
	$3\frac{1}{2}$	$4\frac{1}{2}$	K	Gr.1	Gr.2	Gr.3
Ready to Go				X	X	X
In Development						

Data Collection Method: ____ Group Test ____ Interview
X Individual Test ____ Observation

Estimated Administration Time (min.): 15 minutes

Brief Statement of Procedure: S is shown a simple geometric figure and must then find it in an embedding context.

Minimum Requirements for the Administrator-Observer: Ability to relate with children and follow specified standard procedures. No special education required.

Supporting Statement: As numerous studies have shown, and as has been spelled out in some detail in the body of this report (see section on Measurement of Analytical Functioning), the embedded figures test is one of the prime measures of perceptual field dependence-independence. Since a case has already been made in the body of the report and in the rationales for the block designs and portable rod-and-frame tests for inclusion of several measures of this important dimension of intellectual functioning, no additional arguments will be presented here.

There are currently available two versions of the embedded figures test that are suitable for administration at the preschool level. One is a version developed by Thomas J. Banta as part of the Cincinnatti Autonomy Test Battery, the other is a version developed by Susan Coates who is a member of Herman Witkin's group at the Downstate Medical Center of the State University of New York. After examining both versions and preliminary pilot work on both, it has been concluded that the Coates version has more promise than the Banta version (Banta's procedures seem quite good, but his items leave something to be desired).

It is proposed that the Coates version of the Preschool Embedded Figures Test be administered at the 3½-, 4½-, and 5½-year levels and that the Karp and Konstadt Children's Embedded Figures Test (CEFT) be administered at the 6½-, 7½, and 8½-year levels. The CEFT has been shown to correlate .70 to .86 with Witkin's adult form of the Embedded Figures Test and to have satisfactory reliability (Karp & Konstadt, 1963).

Goodenough, D. R., & Karp, S. A. Field dependence and intellectual functioning. Journal of Abnormal and Social Psychology, 1961, 63, 241-246.

Karp, S. A. Field dependence and overcoming embeddedness. Journal of Consulting Psychology, 1963, 27, 294-302.

Karp, S. A., & Konstadt, N. L. Manual for the Children's Embedded Figures Test. New York: Cognitive Tests, 1963 (Now available from S. A. Karp, Sinai Hospital of Baltimore, Baltimore, Md. 21215).

Witkin, H. A., Dyk, R. B., Faterson, H. F., Goodenough, D. R., & Karp, S. A. Psychological differentiation. New York: Wiley, 1962.

Witkin, H. A., Faterson, H. F., Goodenough, D. R., & Birnbaum, J. Cognitive patterning in mildly retarded boys. Child Development, 1966, 37, 301-316.

Witkin, H. A., Lewis, H. B., Hertzman, M., Machover, K., Meissner, P. B., & Wapner, S. Personality through perception. New York: Harpers, 1954.

Name of Measure: Classroom Dimensions of Teaching Style

Variables Measured: Classroom styles

Status	Age-Grade Level						Adult
	3½	4½	K	Gr.1	Gr.2	Gr.3	
Ready to Go							X
In Development							

Data Collection Method: _X_ Group Test ___ Interview

___ Individual Test ___ Observation

Estimated Administration Time (min.): 10-15 minutes

Brief Statement of Procedure: Part II of the Teacher Questionnaire Form 581-06 (26 questions). S rates dimensions of teaching styles and classroom differences as to their possible importance for contributing to learning of children, and teacher(s) rates his own general teaching behavior on each dimension.

Minimum Requirements for the Administrator-Observer: No special requirements.

Supporting Statement: Of interest will be the extent that the responses obtained are consonant with the behavior observed by PROSE.

Name of Measure: Classroom Observation Rating Scale

Variables Measured: 91 Unipolar Attributes and 22 Bipolar Dimensions found in attached document.

Status	Age-Grade Level					
	$3\frac{1}{2}$	$4\frac{1}{2}$	K	Gr.1	Gr.2	Gr.3
Ready to Go		X	X	?	?	?
In Development						

Data Collection Method: ___ Group Test ___ Interview
___ Individual Test X Observation

Estimated Administration Time (min.): 60 minutes per set of ratings per child.

Brief Statement of Procedure: See Appendix b.

Minimum Requirements for the Administrator-Observer: Mothers with as much education as possible.

Supporting Statement: See chapter in text: D. Children's Personal and Social Development.

Name of Measure: Classroom Teacher Rating Scale

Variables Measured: 91 Unipolar Attributes and 22 Bipolar Dimensions found in attached document.

Status	Age-Grade Level					
	3½	4½	K	Gr.1	Gr.2	Gr.3
Ready to Go						
In Development		X	X	X	X	X

Data Collection Method: ____ Group Test ____X____ Interview
____ Individual Test ____ Observation

Estimated Administration Time (min.): 120 minutes

Brief Statement of Procedure: A set of ratings to be made by teachers toward the end of the school year. The teacher and assistant teacher will be asked by E to complete the ratings of each child in classroom.

Minimum Requirements for the Administrator-Observer: Anyone qualified for other assessment tasks in study could administer ratings to teachers.

Supporting Statement: Teacher ratings have been found to provide reliable and useful information about personality in children (e.g., Digman, 1963; Emmerich, 1966; Walker, 1967). For several reasons it would be important to ask teachers in the longitudinal study to rate their pupils: (1) Such information might be gathered in every year of the study, whereas ratings by trained observers may not be feasible beyond kindergarten. (2) Using ratings on the same children on the same scales repeated each year of the study, it should become possible to determine continuities and discontinuities in the dimensionality of child personality as well as stabilities over time. These consistencies and change in personality might be related to a variety of input variables that will be monitored in the study (3) Data from Medley's PROSE, the trained raters (in early years), teacher ratings, and perhaps even parents' judgments of their children might be related in order to discover similarities and differences in dimensionality of judgment among these approaches to personality assessment. (4) A teacher's judgments about the children in her classroom may well be related to other characteristics in the teacher.

It is proposed that teachers be asked in the Spring to rate each child in her classroom on a set of rating scales. These scales will be designed to be as similar as possible to those already developed for the trained raters of the children's classroom behaviors. This procedure will be developed by Walter Emmerich.

Name of Measure: Clymer-Barrett Prereading Battery, Test 6, Copy-a-sentence

Variables Measured: Writing: Word copying

Status	Age-Grade Level					
	3½	4½	K	Gr.1	Gr.2	Gr.3
Ready to Go				X	X	X
In Development						

Data Collection Method: _X_ Group Test ____ Interview

____ Individual Test ____ Observation

Estimated Administration Time (min.): 5 minutes

Brief Statement of Procedure: Designed to determine ability to perceive and reproduce whole words in a given sequence. Requires S to perceive order of letters in each word, groupings of letters which make up words, and sequence of words in a sentence (7 words). Also requires S to demonstrate perceptual accuracy by copying sentence in space provided. Five minute time limit to copy (manuscript) a 7 word sentence. Score is the number of legible and properly placed words S produces in time allowed. Guidelines are provided. Directions to S, "On the lines below the words, I want you to write the words with you pencil. Make your words just like the ones you see here."

Minimum Requirements for the Administrator-Observer: Ability to administer the tests according to detailed instructions in the manual. Administrator should be familiar to Ss and have the kind of voice they are used to listening to in school.

Supporting Statement: Included as a measure of ability to produce written word, In addition, Clymer (1963) found that this task correlated with word recognition (near the end of grade 1) around the level of .50 which compares favorably with correlation coefficients generally reported between total scores on reading readiness tests and word recognition scores toward the end of grade 1.

Reliability of this subtest score for standardization group is given in the manual as .94. Also reported are reliability figures for four groups of pupils selected for their differences from the norming population; three of these appear to be pertinent:

First grade in a rural, white, low-ability school, N = 52	.94
First grade in a rural, Negro, low-ability school, N = 28	.95
Five first grades in two mixed-ethnic, deprived neighborhood schools in a very large city, N = 111	.95

Clymer, T. The copy a sentence test as a predictor of reading success in grades one and two. Paper presented at the AERA-IRA meeting, Chicago, February 15, 1963.

Clymer, T. & Barrett, T. C. Clymer-Barrett prereading battery, directions manual with norms for kindergarten and grade one. Princeton, N. J.: Personnel Press, 1968.

Name of Measure: Community: Parent Interview Form*

Variables Measured: (1) Physical facilities and characteristics of community. (2) Routine community area of target children's parents. (3) Social characteristics of area population. (4) Social characteristics of children's parents.

Status	Age-Grade Level						
	3½	4½	K	Gr.1	Gr.2	Gr.3	Adult
Ready to Go							x
In Development							

Data Collection Method: ___ Group Test ___x___ Interview

___ Individual Test ___ Observation

Estimated Administration Time (min.): 40 minutes at home, 30 minutes in group situation at testing center

Brief Statement of Procedure: Interview

Minimum Requirements for the Administrator-Observer: Ability to read and understand questions, record answers.

Supporting Statement: See chapter in text: J. The Impact of the Community. See page J-9 for a justification of physical facilities; page J-11 for routine community area; page J-14 for social characteristics of area population; and J-15 for social characteristics of children's parents.

*To be combined with Family Interview

Name of Measure: Community Facilities Observation Form

Variables Measured: Physical facilities in community area

Status	Age-Grade Level						Community
	3½	4½	K	Gr.1	Gr.2	Gr.3	
Ready to Go							
In Development							x

Data Collection Method: ____ Group Test ____ Interview
____ Individual Test x Observation

Estimated Administration Time (min.): (Not applicable)

Brief Statement of Procedure: Observe number and type of physical facilities in target areas.

Minimum Requirements for the Administrator-Observer: Be able to observe and write down observations; Task Force or ETS Field Coordinator

Supporting Statement: See chapter in text: J. The Impact of the Community, Page J-9.

Name of Measure: Community Population Characteristics

Variables Measured: Social characteristics of area population

Status	Age-Grade Level						Community records
	3½	4½	K	Gr.1	Gr.2	Gr.3	
Ready to Go							x
In Development							

Data Collection Method:

___ Group Test
___ Individual Test
___ Interview
___ Observation
__X__ Recording of existing data

Estimated Administration Time (min.):

Not applicable

Brief Statement of Procedure: Search through census data, hospital, police, welfare, and other records of municipal, county, state, or federal government agencies for information requested.

Minimum Requirements for the Administrator-Observer: Be able to locate correct agency and record information required; ETS Field Coordinator

Supporting Statement: See chapter in text: J. The Impact of the Community, Page J-14.

Name of Measure: Conception of Natural Events

Variables Measured: Egocentrism

Status	Age-Grade Level					
	3½	4½	K	Gr.1	Gr.2	Gr.3
Ready to Go		(X)	X	X	X	X
In Development						

Data Collection Method: ___ Group Test ___ Interview

_X_ Individual Test ___ Observation

Estimated Administration Time (min.): 5-10 minutes

Brief Statement of Procedure: Interview in which S is asked for beliefs and explanations regarding various natural events (e.g., the origin of night). S is asked a series of general and specific questions regarding natural events.) Exact procedure will be patterned after Laurendeau and Pinard (1962).

Minimum Requirements for the Administrator-Observer: Training in interview procedure.

Supporting Statement: In a number of his studies Piaget (1929, 1930) has used children's ideas about natural events as a way of investigating characteristics of child thought. Children were questioned on such topics as the origin of night, the movement of clouds, the floating of objects, etc., with the intent of identifying some of the general processes underlying their replies. The interest in Piaget's research is not so much in the content of the child's answer, but rather in questions of how and why children arrive at their explanations and beliefs. Piaget's methods demonstrate that useful questions for such purposes are those that deal with complex phenomena, beyond the complete comprehension of the child but nevertheless phenomena which are familiar and interesting to him. In addition, questions about such events are found to elicit meaningful responses over a wide age range and thus permit rather direct age comparisons.

In developing standard procedures based on this aspect of Piaget's work, the problem of modifying his clinical technique is particularly significant. Laurendeau and Pinard (1962) have undertaken a series of studies on egocentrism

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Name of Measure: Conception of Natural Events

Variables Measured: Egocentrism

Status	Age-Grade Level					
	3½	4½	K	Gr.1	Gr.2	Gr.3
Ready to Go		(X)	X	X	X	X
In Development						

Data Collection Method: ___ Group Test ___ Interview

_X_ Individual Test ___ Observation

Estimated Administration Time (min.): 5-10 minutes

Brief Statement of Procedure: Interview in which S is asked for beliefs and explanations regarding various natural events (e.g., the origin of night). S is asked a series of general and specific questions regarding natural events.) Exact procedure will be patterned after Laurendeau and Pinard (1962).

Minimum Requirements for the Administrator-Observer: Training in interview procedure.

Supporting Statement: In a number of his studies Piaget (1929, 1930) has used children's ideas about natural events as a way of investigating characteristics of child thought. Children were questioned on such topics as the origin of night, the movement of clouds, the floating of objects, etc., with the intent of identifying some of the general processes underlying their replies. The interest in Piaget's research is not so much in the content of the child's answer, but rather in questions of how and why children arrive at their explanations and beliefs. Piaget's methods demonstrate that useful questions for such purposes are those that deal with complex phenomena, beyond the complete comprehension of the child but nevertheless phenomena which are familiar and interesting to him. In addition, questions about such events are found to elicit meaningful responses over a wide age range and thus permit rather direct age comparisons.

In developing standard procedures based on this aspect of Piaget's work, the problem of modifying his clinical technique is particularly significant. Laurendeau and Pinard (1962) have undertaken a series of studies on egocentrism

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and causal thinking and their work offers some solutions to the problem of translating Piaget's method into a more objective approach. The selection and development of tasks for the present study is based upon their comprehensive research.

Laurendeau, M., & Pinard, A. Causal thinking in the child. New York: International Universities Press, 1962.

Piaget, J. The child's conception of the world. New York: Harcourt, Brace & World, 1929.

Piaget, J. The child's conception of physical causality. London: Kegan Paul, 1930.

Name of Measure: The Conceptual Systems Test (Harvey, White, Prather, Alter, & Hoffmeister)

Variables Measured: Concreteness-abstractness of conceptual or belief systems

Status	Age-Grade Level						Adult
	3½	4½	K	Gr.1	Gr.2	Gr.3	
Ready to Go							X
In Development							

Data Collection Method: X Group Test ___ Interview ___ Individual Test ___ Observation

Estimated Administration Time (min.):

Brief Statement of Procedure: S responds on a six-point scale (from "Completely disagree" to "Completely agree") to items

Minimum Requirements for the Administrator-Observer: Self-administered.

Supporting Statement: The CST was developed through Tryon's cluster and factor analysis (Tryon and Bailey, 1965, 1966). Four factors were found to be theoretically consistent with the major characteristics of the four principal conceptual systems or levels of concreteness-abstractness posited by Harvey, et al (1961). These factors are 1) Divine fate control, 2) Need for simplicity-certainty, 3) Tolerance of complexity and uncertainty, 4) Relativism of truth. An overall abstractness score was obtained by summing item responses.

Harvey, O. J., Hunt, D. E., & Schroder, H. M. Conceptual systems and personality organization. New York: Wiley, 1961.

Harvey, O. J., White, B. J., Prather, M., Alter, R. D., & Hoffmeister, J. K Teachers' belief systems and preschool atmospheres. Journal of Educational Psychology, 1966, 57, 373-381.

Harvey, O. J., White, B. J., Prather, M., & Hoffmeister, J. K Teachers' beliefs, classroom atmosphere and student behavior. Contract OEO-1274, supported by the Office of Economic Opportunity with the Extension Division of the University of Colorado.

Harvey, O. J., White, B. J., Prather, M., Alter, R. D., & Hoffmeister, J. K. Teachers' belief systems and preschool atmospheres. Contract OEO - 517, supported by the Head Start Program, Office of Economic Opportunity, with the Colorado Extension Division.

Tryon, R. C., & Bailey, D. E. Try user's manual. Boulder: University of Colorado Computing Center, 1965.

Tryon, R. C., & Bailey, D. E. The B. C. Try system of cluster analysis. Boulder: University of Colorado Computing Center, 1966.

Name of Measure: The "This I Believe" Test (Harvey, White, Prather, Alter, & Hoffmeister)

Variables Measured: Concreteness-abstractness of conceptual or belief systems

Status	Age-Grade Level						Teacher
	3½	4½	K	Gr.1	Gr.2	Gr.3	X
Ready to Go							
In Development							

Data Collection Method: _X_ Group Test ____ Interview ____ Individual Test ____ Observation

Estimated Administration Time (min.):

Brief Statement of Procedure: S indicates his beliefs about a number of socially and personally relevant concept referents by completing, in two or three sentences, the phrase "This I believe about _____.", the blank being replaced successively by one of the following referents: religion, friendship, the American way of life, sin, education, the family, people on welfare, punishment, teaching, and sex. From the relativism, tautologicalness, novelty, and connotative implications or richness of the completions, respondents may be classified into one of the four principal systems posited by Harvey et al (1961) or into some admixture of two or more systems, from the most concrete mode of dimensionalizing and construing the world to the most abstract.

Minimum Requirements for the Administrator-Observer: Self-administered

Supporting Statement: Teachers classified on the basis of the TIB as being concrete were observed as being significantly less resourceful ($t = 4.03$, $p < .001$), significantly more dictatorial ($t = 1.67$, $p < .05$), and were more punitive, although not significantly more, ($t = 1.05$, $p < .10$) than teachers classified as abstract. These results replicated the more essential findings of the earlier study of Harvey, et al (1966) and indicate that variation in the concreteness-abstractness of teachers' beliefs generates theoretically consistent and predictable parallels in the overt behavior of these individuals.

Harvey, O. J., Hunt, D. E., & Schroder, H. M. Conceptual systems and personality organization. New York: Wiley, 1961.

Harvey, O. J., White, B. J., Prather, M., Alter, R. D., & Hoffmeister, J. K. Teachers' belief systems and preschool atmospheres. Journal of Educational Psychology, 1966, 57, 373-381.

Harvey, O. J., White, B. J., Prather, M., & Hoffmeister, J. K. Teachers' beliefs, classroom atmosphere and student behavior. Paper supported by the Office of Economic Opportunity, Contract OEO-1274, with the Extension Division of the University of Colorado.

Harvey, O. J., White, B. J., Prather, M., Alter, R. D., & Hoffmeister, J. K. Teachers' belief systems and preschool atmospheres. Study supported by the Head Start Program, Office of Economic Opportunity under Contract OEO-517 with the Colorado Extension Division.

Name of Measure: Conservation of Number

Variables Measured: Conception of number

Status	Age-Grade Level					
	$3\frac{1}{2}$	$4\frac{1}{2}$	K	Gr.1	Gr.2	Gr.3
Ready to Go		X	X	X	X	
In Development						

Data Collection Method:

___ Group Test ___ Interview

_X_ Individual Test ___ Observation

Estimated Administration Time (min.): 5-10 minutes

Brief Statement of Procedure: A set of cubes of one color is placed in a row on the center of the table. An equivalent row is constructed, using cubes of another color. S is told there are as many objects in one row as the other. This is followed by a series of spatial transformations in which E expands or compresses one row. S is questioned on the numerical equivalence of the sets after each transformation. (Melton, et al, 1968; Rothenberg & Courtney, 1968)

Minimum Requirements for the Administrator-Observer: Training on administering similar tasks to young children.

Supporting Statement: The conceptual ability, represented by conservation of quantity, plays a central role in Piaget's analysis of the development of logical operations. This ability to view quantity as constant throughout perceptual changes is the central subject of his two volumes on quantity (Piaget, 1952; Piaget & Inhelder, 1941). Moreover, in Piaget's comprehensive theoretical statements (e.g., 1950) conservation serves as the prime illustration of the accomplishments of operational thought. It is not surprising, therefore, that of the many Genevan tasks, conservation has received most extensive attention in American research (Stendler, 1964).

The task of conservation of discontinuous quantities is proposed for inclusion in the present study. However, unlike some of the research, conception of number will include conservation but will not be defined by it alone.

Melton, R. S., Charlesworth, R., Tanaka, M. N., Rothenberg, B. B., Pike, L. W., Bussis, A. M., & Gollin, E. S. Cognitive growth in preschool children. Research Memorandum 68-13. Princeton, N.J.: Educational Testing Service, 1968.

Piaget, J. The psychology of intelligence. New York: Harcourt, Brace & World, 1950.

Piaget, J. The child's conception of number. New York: Humanities, 1952.

Piaget, J., & Inhelder, B. Le developpement des quantites chez l'enfant. Neuchatel: Delachaux et Niestle, 1941.

Rothenberg, B. B., & Courtney, R. G. Conservation of number in very young children. Research Bulletin 68-51. Princeton, N. J.: Educational Testing Service, 1968.

Stendler, C. B. Readings in child behavior and development. New York: Harcourt, Brace & World, 1964, p. 328.

Name of Measure: Cooperative Preschool Inventory (Caldwell)

Variables Measured: General knowledge (21 items)
Listening: word meaning (2 items)
Listening: comprehension (10 items)
Writing: form copying (4 items)
Quantitative (24 items)
Speaking: labeling (3 items)

Status	Age-Grade Level					
	3½	4½	K	Gr.1	Gr.2	Gr.3
Ready to Go	x	x	x			
In Development						

Data Collection Method:
___ Group Test
___ Interview
x Individual Test
___ Observation

Estimated Administration Time (min.): 20 minutes

Brief Statement of Procedure: The Cooperative Preschool Inventory has been cut from 85 to 64 items on the basis of item analysis data. The items can be classified as given above. Special equipment has been kept to a minimum--3 cars, 8 large crayons, 10 checkers, 3 paper boxes (7½, 9, and 11 inches), and a blank piece of paper. S is required to answer questions and to perform certain acts (including form copying). E records responses--right, wrong, or DK (encompassing, "I don't know," no response, and unrelated response).

Minimum Requirements for the Administrator-Observer: The test was designed for administration by the classroom teacher and requires little "sophistication" on the part of the administrator. The scoring is relatively simple and the manual provides cues for the administrator to follow in the event that a response is incomplete or unclear.

Supporting Statement: The Preschool Inventory was designed as an assessment procedure for use by the classroom teacher with children in the age range of from 3 to 6. The test results yield an estimate of the degree of disadvantage evident in children from deprived backgrounds and, becuase of its sensitivity to experience, can be used to measure changes associated with educational intervention.

The initial 85 items were selected on the basis of a principal components factor analysis. One has every reason to expect the experimental 64 item test to have very similar reliability and validity statistics to those reported for the 85 item test. Williams and Stewart reported a reliability of .93 (estimated by coefficient Alpha) for a sample of 445 children attending summer Head Start programs in the summer of 1966. For the same group, a correlation of .77 was reported between total score on the Preschool Inventory and MA from the Stanford-Binet.

Williams, R. H. & Stewart, E. Elizabeth. Some characteristics of children in the Head Start program. Section One of Final Report, Project Head Start--Summer 1966. Final report under Contract No. OEO-1359. Princeton, N.J.: Educational Testing Service, June 15, 1966.

Name of Measure: Cooperative Primary Tests: Listening (Forms 12B, 23A, 23B)

Variables Measured: Listening: vocabulary, recall, comprehension, and interpretation (outline of test content follows)

Status	Age-Grade Level					
	3½	4½	K	Gr.1	Gr.2	Gr.3
Ready to Go				X	X	X
In Development						

Data Collection Method: X Group Test ___ Interview ___ Individual Test ___ Observation

Estimated Administration Time (min.): 35 minutes

Brief Statement of Procedure: Form 12A is used in grade 1, 23A in grade 2, 23B in grade 3. Each item is related to a word, sentence, or paragraph read aloud by E. S marks one of three pictures which illustrates or is associated with what was heard. This is a test of face-to-face listening comprehension, not of understanding recordings.

Minimum Requirements for the Administrator-Observer: Ability to administer the tests according to detailed instructions in the manual. Administrator should be familiar to Ss and have the kind of voice they are used to listening to in school.

Supporting Statement: The Cooperative Primary Tests were developed by ETS to measure basic verbal and mathematical understandings corresponding to some of the major objectives of primary education. Development was substantially aided by advice from outside psychologists, teachers, and other educators and from study of written statements of objectives, curriculum guides, and instructional materials. A list of key personnel participating in the effort follows.

The Handbook (Princeton, N.J.: Cooperative Test Division, Educational Testing Service, 1967) includes detailed discussions of the test philosophy and development; the usefulness of the tests with the disadvantaged; the use of the Pilot (practice) test; pretesting, norming, and equating operations (the tests were normed on national samples of children from 170-185 schools); and statistical properties of the final forms.

Name of Measure: Cooperative Primary Tests: Mathematics (Forms 12B, 23A, 23B)

Variables Measured: Concepts of number, symbolism, operation, function and relation, approximation, estimation, measurement, geometry (outline of test content follows)

Status	Age-Grade Level					
	3½	4½	K	Gr.1	Gr.2	Gr.3
Ready to Go				X	X	X
In Development						

Data Collection Method: X Group Test ____ Interview
____ Individual Test ____ Observation

Estimated Administration Time (min.): 50 minutes

Brief Statement of Procedure: Form 12B is used in grade 1, 23A in grade 2, 23B in grade 3. Part one: E reads stimulus material (S's booklet may contain illustrative material that amplifies what E says) and S marks one of three choices (expressed in terms of pictures, forms, mathematical symbols). Part two: S matches pictures, forms, or mathematical symbols to one of three choices expressed in the same terms.

Minimum Requirements for the Administrator-Observer: See Cooperative Primary Tests: Listening.

Supporting Statement: See Cooperative Primary Tests: Listening.

Name of Measure: Cooperative Primary Tests: Pilot Test

Variables Measured: ----

Status	Age-Grade Level					
	$3\frac{1}{2}$	$4\frac{1}{2}$	K	Gr.1	Gr.2	Gr.3
Ready to Go				X		
In Development						

Data Collection Method: _X_ Group Test ____ Interview
____ Individual Test ____ Observation

Estimated Administration Time (min.): 10 minutes

Brief Statement of Procedure: This 10-item test is designed to give children practice with the format and the kinds of questions they will encounter in the regular tests in the series. It should be used prior to the other tests for all children in grade 1 and for any children in grades 2 and 3 who have not had experience with standardized, group tests before or who teachers feel may have trouble with the directions presented by the other Primary tests.

Minimum Requirements for the Administrator-Observer: See Cooperative Primary Tests: Listening.

Supporting Statement: See Cooperative Primary Tests: Listening.

Name of Measure: Cooperative Primary Tests: Reading (Forms 12B, 23A, 23B)

Variables Measured: Reading: vocabulary, extraction, comprehension, interpretation (outline of test content follows)

Status	Age-Grade Level					
	$3\frac{1}{2}$	$4\frac{1}{2}$	K	Gr.1	Gr.2	Gr.3
Ready to Go				X	X	X
In Development						

Data Collection Method: X Group Test ____ Interview

____ Individual Test ____ Observation

Estimated Administration Time (min.): 35 minutes

Brief Statement of Procedure: Form 12B is used in grade 1, 23A in grade 2, 23B in grade 3. Each item consists of a word, sentence, or paragraph that S reads and three response choices (expressed in pictorial, word, or sentence forms). S marks the appropriate one.

Minimum Requirements for the Administrator-Observer: The administrator has to give only general instructions; then S works on his own. E does not have to time the procedures, since there are no time limits for the Cooperative Primary Tests.

Supporting Statement: See Cooperative Primary Tests: Listening.

Name of Measure: Cooperative Primary Tests: Word Analysis (Forms 13A, 13B)

Variables Measured: letter discrimination, word discrimination, recognition of word properties (outline of test content follows)

Status	Age-Grade Level					
	3½	4½	K	Gr.1	Gr.2	Gr.3
Ready to Go				X	X	X
In Development						

Data Collection Method: X Group Test ____ Interview

____ Individual Test ____ Observation

Estimated Administration Time (min.): 40 minutes

Brief Statement of Procedure: Form 13B is used in grades 1 and 3, 13A in grade 2. Part One: E asks the child what rhymes with, begins or ends with the same sound as, has the same sound in it as ----; what letters are in both ---- and ----; which word has letter that is not sounded; which could be a real word. S marks one of three pictures, words, nonsense syllables, or letter combinations. Part Two: S matches words, pictures to words or initial consonants, compound words or contractions to their elements, roots to derivatives and vice versa. Child always marks one of three choices.

Minimum Requirements for the Administrator-Observer: See Cooperative Primary Tests: Listening. E's enunciation is very important on Part One of this test.

Supporting Statement: See Cooperative Primary Tests: Listening.

Name of Measure: Cooperative Primary Tests: Writing Skills (Forms 23A, 23B)

Variables Measured: recognition of word and sentence properties: spelling, punctuation-capitalization, usage (outline of test content follows)

Status	Age-Grade Level					
	3½	4½	K	Gr.1	Gr.2	Gr.3
Ready to Go					X	X
In Development						

Data Collection Method: X Group Test ___ Interview ___ Individual Test ___ Observation

Estimated Administration Time (min.): 40 minutes

Brief Statement of Procedure: Form 23A is used in grade 2, 23B in grade 3. In each item, S is presented with three choices: Part One, three words--he picks the one spelled correctly. Part Two, three sentences--he picks the one that's correct in terms of punctuation-capitalization. Part Three, three sentences--he picks the one that's "best" (usage).

Minimum Requirements for the Administrator-Observer: The administrator has to give only general instructions; then Ss work on their own. E does not have to time the procedures, since there are no time limits for the Cooperative Primary Tests.

Supporting Statement: See Cooperative Primary Tests: Listening.

Name of Measure: Developmental Test of Visual-Motor Integration (Beery)

Variables Measured: Form reproduction

Status	Age-Grade Level					
	3½	4½	K	Gr.1	Gr.2	Gr.3
Ready to Go	X	X	X	X	X	X
In Development						

Data Collection Method:

____ Group Test

____ Interview

_X_ Individual Test

____ Observation

Estimated Administration Time (min.): 2-10 minutes

Brief Statement of Procedure: S is presented with a booklet of forms (3 to a page) and asked to copy all figures in a blank space immediately below standard.

Minimum Requirements for the Administrator-Observer: No special requirements.

Supporting Statement: This measure is included because of its precursor relationship to writing. It is also an indicator of complex integrative skills at a non-verbal level.

Name of Measure: Estimate of Time Spent on Certain Instructional Activities

Variables Measured: Teaching time estimates

Status	Age-Grade Level						Adult
	3½	4½	K	Gr.1	Gr.2	Gr.3	
Ready to Go							X
In Development							

Data Collection Method: _X_ Group Test ____ Interview

____ Individual Test ____ Observation

Estimated Administration Time (min.): 5 minutes

Brief Statement of Procedure: Part III of the Teacher Questionnaire Form 581-06 (8 questions). S estimates the amount of time spent in several broad categories of classroom activity.

Minimum Requirements for the Administrator-Observer: Self-administered

Supporting Statement: This instrument is a simple one. It asks the teacher to indicate the percentage of time spent in the classroom on given subject areas. Various studies seem to indicate that mere amount of time is not an important variable affecting student outcomes. This instrument along with other data may be able to shed more light on this topic especially important to the teaching of basic subjects such as reading.

Name of Measure: ETS Communications Skills V-5

Variables Measured: Listening: recall, comprehension, interpretation

Status	Age-Grade Level					
	3½	4½	K	Gr.1	Gr.2	Gr.3
Ready to Go			X			
In Development						

Data Collection Method:
X Group Test (if partitions available)
X Individual Test
Interview
Observation

Estimated Administration Time (min.): 5-10 minutes

Brief Statement of Procedure: A set of 10 items, each with 3 pictorial choices. E reads a short story, then retells a short section at a time and asks 2 questions per section. S points to a picture in response to each question.

Minimum Requirements for the Administrator-Observer: No special requirements.

Supporting Statement: Much of the research on reading comprehension in the elementary level has reported a close relationship between listening comprehension (Cleland & Toussaint, 1962; Dow, 1958; Hampleman, 1958) and reading skills. As a precursor to later reading skills, it would seem reasonable to consider the story listening comprehension skills of children during the kindergarten period.

The ETS Communication Skills Test, V-5, was developed as a classroom test to measure the comprehension of a short story. The story was specially written around a simple incident in order to avoid problems of previous familiarity. For the 2 booklets (proposed test is first booklet only) test statistics on samples of 500 first grade children (total over 1,000) were as follows:

Mean	SD	Poss. Score Range	KR20 (reliability)
17.02	3.02	0 - 20	.781

Cleland, D.L., & Toussaint, I.H. The interrelationships of reading, listening, arithmetic computation and intelligence. Reading Teacher, 1962, 15, 228-231.

Dow, C.W. Integrating the teaching of reading and listening comprehension. Journal of Communication, 1958, 8, 118-126.

Hampleman, R.S. Comparisons of listening and reading comprehension ability of fourth- and sixth-grade pupils. Elementary English, 1958, 35, 49-53.

Name of Measure: ETS Enumeration

Variables Measured: Conception of number

Status	Age-Grade Level					
	$3\frac{1}{2}$	$4\frac{1}{2}$	K	Gr.1	Gr.2	Gr.3
Ready to Go	X	X				
In Development			X	X	X	X

Data Collection Method: ___ Group Test ___ Interview
X Individual Test ___ Observation

Estimated Administration Time (min.): 5 minutes

Brief Statement of Procedure: Materials consist of pages with pictures (varying in quantity) arranged in different ways (randomly, rows, straight line). Child is asked to point to each picture "just once," or " only once." His overt pointing responses are recorded, with records of any errors of repetition or omission.

Minimum Requirements for the Administrator-Observer: Training in administering similar tasks to young children

Supporting Statement: A critical first step in the development of quantitative thinking is the ability to attend systematically to each item of an array. Piaget (1952) investigated some aspects of this ability in his tasks of provoked or spontaneous correspondence. A method developed by Potter and Levy (1958) permits a clearer look at this specific skill and their procedures appear to be considerably less "wordy" than the Genevan procedures. The task also lends itself to an experimental inquiry into the development of spontaneous use of strategies through varying the spatial arrangement of enumerated items. They report:

> Finally, the findings establish that the capacity to hold in mind an array of items that one has enumerated shows a steady and dramatic increase in the age range of $2\frac{1}{2}$-4. That is an age in which conventional measures of span of attention, such as the digit span, are of low reliability. Thus, the present technique, which in some measure disentangles simple spatial memory span (seen most clearly in random arrays) from the ability to adopt strategies to reduce memory load (in various orderly displays), may be of value to investigators of early cognitive development.

The proposed instrument is being developed as an extension and revision of the Potter method. Plans call for the inclusion of arrays which will permit the observation of grouping strategies and seriation strategies within the enumeration array.

Piaget, J. The child's conception of number. New York: Humanities, 1952.

Potter, M. C., & Levy, E. I. Spatial enumeration without counting. Child Development, 1968, 39, 265-272.

Name of Measure: ETS Logical Reasoning Tests: (Written Exercises, VI-4 and VI-5)

Variables Measured: Concept utilization: ability to abstract the common property of a given grouping and to select an item with a similar property that belongs with the group (inclusion) or delete an item that does not belong (exclusion). Ability to recognize groupings that are based on two properties in common (some items only).

Status	Age-Grade Level					
	3½	4½	K	Gr.1	Gr.2	Gr.3
Ready to Go			X	X	X	
In Development						

Data Collection Method:

X	Group Test(6½-7½)	___	Interview
X	Individual Test(5½)	___	Observation

Estimated Administration Time (min.): 15-20 minutes

Brief Statement of Procedure: Paper and pencil format with 20 picture items. S marks an "X" on the picture he thinks does or does not belong with a particular group of pictured objects. When this test was piloted with small groups of kindergarten Ss, this procedure was unfeasible. The test should be individually administered at the kindergarten age level.

Minimum Requirements for the Administrator-Observer: No special requirements.

Supporting Statement: Data are available on a 500 sample of middle and lower class first grade Ss (6½ years old) in New York City. Feedback from NYC and ETS observations indicate that children enjoy the tests; available data indicate that they are relatively easy (mean delta of 8.2). These data, however, were obtained after the children had three practice tests on similar types of items for the purpose of instruction (see Written Exercises for First Graders for a description of the dual instruction-measurement purpose of the battery). Used without practice tests, it is reasonable to anticipate that the Logical Reasoning Written Exercises would be more discriminating at the first grade level.

It is suggested that the test be tried out at adjacent grade levels (K and 2nd) in the cross-sectional testing to obtain comparability data with the other concept formation tasks.

Name of Measure: ETS Matched Pictures Comprehension Task

Variables Measured: Listening: recognition of word properties, recognition of sentence properties

Status	Age-Grade Level					
	3½	4½	K	Gr.1	Gr.2	Gr.3
Ready to Go		X	X			
In Development	X					

Data Collection Method: ___ Group Test ___ Interview
X Individual Test ___ Observation

Estimated Administration Time (min.): 10 minutes

Brief Statement of Procedure: A "matched pictures" presentation of 20 cards containing pairs of stimulus pictures. Both pictures contain similar elements, but they depict different relationships; e.g., tenses. E describes both members of each pair of pictures; e.g., "This picture is called 'Bear is sitting' and this picture is called 'Bear is not sitting.'" S is then asked to point to a specific member of the pair. At ages 3½ and 4½, the items include tenses, negations and prepositions.

Minimum Requirements for the Administrator-Observer: No special requirements.

Supporting Statement: Investigations on the 4-6 year old child's production and use of basic syntactic structures (Berko, 1958; Menyuk, 1964) have indicated that there are consistent and orderly mistakes in the use of the small words and inflections that govern syntactic structure. There is also evidence (Bernstein, 1959, 1961; John & Goldstein, 1964) that the child from a poor language environment (low SES) is further penalized so that the result is a highly "restricted" language.

The proposed measure was developed at ETS (Melton, Charlesworth, Tanaka, Rothenberg, Pike, Bussis, & Gollin, 1968) utilizing Roger Brown's "Matched Pictures" technique, in response to a need for a series of syntactically structured tasks which would require a minimal response from the child (i.e., pointing) and permit the use of nonprofessional interviewers (i.e., mothers from the neighborhood). It was administered to a New York City sample of approximately 100 low SES and 100 middle SES children (each group divided into about half

Pre-K and K children) during the spring of 1967. The results showed significant SES differences and confirmed the findings of other researchers regarding no sex differences and a common pattern of little change during the 4-5 year period. It is currently being piloted for use with younger children to see whether age differences will be observable at earlier periods.

Berko, J. The child's learning of English morphology. Word, 1958, 14, 150-177.

Bernstein, B. A public language: some sociological implications of a linguistic form. British Journal of Sociology, 1959, 10, 311-326.

Bernstein, B. Social class in linguistic development: a theory of social learning. In A. H. Halsey, J. Floud, & C. A. Anderson (Eds.) Education, Economy, & Society. New York: Crowell, Collier Publishing Company, 1961.

John, V. P. & Goldstein, L. S. Social context of language acquisition. Merrill-Palmer Quarterly of Behavior and Development, 1964, 10, 265-275.

Melton, R. S., Charlesworth, R., Tanaka, M. N., Rothenberg, B. B., Pike, L. W., Bussis, A. M., & Gollin, E. S. Cognitive growth in preschool children. Research Memorandum 68-13. Princeton, N. J.: Educational Testing Service, 1968.

Menyuk, P. Syntactic rules used by children from preschool through first grade. Child Development, 1964, 35, 533-546.

Name of Measure: ETS Spatial Egocentrism

Variables Measured: Egocentrism

Status	Age-Grade Level					
	3⅓	4⅓	K	Gr.1	Gr.2	Gr.3
Ready to Go		X	X			
In Development				X	X	X

Data Collection Method: ___ Group Test ___ Interview
_X_ Individual Test ___ Observation

Estimated Administration Time (min.): 5-10 minutes

Brief Statement of Procedure: Set of 3 toy animals and building plus set of drawings depicting central objects from different points of view. Set of pictorial test items from the Spatial Relations set of New York City Project Written Exercises. S is asked to identify parts of an object (e.g., toy, animal or building) in both the actual and pictured versions. Object is placed in center of table. Another object (e.g., doll or dog) is moved to different positions around the table, and S is asked to identify (verbally and pointing to picture) what part of the central object is seen. Other items may be added one by one to increase complexity of central object.

Minimum Requirements for the Administrator-Observer: Learn positions of objects in array. Record responses.

Supporting Statement: Piaget (1952) has pointed out that the development of the ability to use non-egocentric approaches to solving problems is critical to the cognitive and social growth of the child. As the child matures he must gradually learn to consider problems from points of view other than his own personal one in order to arrive at appropriate solutions. Three items in the Written Exercises used in our New York City research with first graders were designed as pictorial translations of Piaget's "egocentrism tasks." An item analysis on a sample of 500 children in New York City revealed that these spatial egocentrism items were passed by the children of greater than average ability (mean criterion score of 14.4-14.7) in Negro, Puerto Rican and "Other" (white) groups. A study (San Mateo Study) done elsewhere on Project Head Start Children used these same three items and reported a positive correlation ($r = +.65$, $p < .01$) with Stanford-Binet IQ scores.

The theoretical formulations and research of Piaget on egocentrism has involved itself in both social (Piaget, 1966) and cognitive-perceptual (Piaget & Inhelder, 1956) contexts. Although the proposed measure is concerned with the cognitive-

perceptual aspects, other research (Cowan, 1966) has established the close relationship between this type of skill and social behavior. The animal task is similar to Laubengayer's (1965, 1966) task in which the stimuli were a rubber lion and a small toy bug. Using middle class children, aged three to five and one half, she found that the child's ability to answer in a nonegocentric manner was related not only to the number and distinctiveness of the object array but also was related to the number of response choices he had. The highest number of correct responses resulted when the child was asked to merely give a verbal answer to the question: "Which part of the lion does the doll see?" The most difficult task was to choose the correct answer from a choice of four pictures. In a later part of her study Laubengayer found that lower class children performed less well than did middle class children on an egocentrism pretest. However, after a series of training sessions in nonegocentric behavior, they made significant gains and actually performed at a higher level than the middle class children on the posttest. This finding and the evidence from the New York City study suggests that the ability to decenter may be a basic cognitive skill which is available or responsive to intervention techniques in lower class children.

We hope to look at the correlation between the nonegocentric responses on our Egocentrism measure and the Peabody Picture Vocabulary Test (considered as an IQ measure). Thus, the hypothesis that IQ and ability to respond in a non-egocentric manner are positively correlated regardless of socio-economic level can be tested. A social egocentrism measure for the older levels will be developed and the correlations between such a measure and the spatial egocentrism task will be obtained.

Cowan, P. A. Cognitive egocentrism and social interaction in children. Paper presented at the meeting of the American Psychological Association, New York, September 1966.

Laubengayer, Nancy. The ability of the preschool child to take the point of view of another person and the effects of training on his spatial egocentrism. Paper presented at the meeting of the Midwest Association for the Education of Young Children, Toronto, May 1965.

Laubengayer, Nancy. The effects of training in the spatial egocentrism of preschoolers. Unpublished MA thesis, University of Minnesota, 1966.

Piaget, J. The child's conception of number. New York: Humanities, 1952.

Piaget, J. Language and thought of the child. Cleveland: Meridian, 1966.

Piaget, J., & Inhelder, B. The child's conception of space. London: Routledge & Kegan Paul, 1956.

Name of Measure: ETS Story Sequence Task, Part I

Variables Measured: Listening: recall, comprehension

Status	Age-Grade Level					
	3½	4½	K	Gr.1	Gr.2	Gr.3
Ready to Go	X	X				
In Development						

Data Collection Method: ___ Group Test ___ Interview

_X_ Individual Test ___ Observation

Estimated Administration Time (min.): 5-10 minutes

Brief Statement of Procedure: Two sets (3 and 4 cards each respectively) of cartoon style picture cards showing animals. There is no apparent sequence in the pictured situations. After instructional period, S is shown an array of picture cards. E tells a story and the child is asked to select the appropriate cards in order as the story is being told.

Minimum Requirements for the Administrator-Observer: No special requirements.

Supporting Statement: The relationship between listening comprehension and reading comprehension has been widely confirmed (e.g., Austin, 1960; Hildreth, 1948; Marsden, 1951). At the pre-reading ages, there is a need to have several different ways to observe the ability to listen. One method is to have the child answer questions by pointing to a pictured response (see N.Y.C. Communication Skills test). This method does require some memory on the part of the child, so that for the very young child it is proposed that it would be more appropriate to have the child respond during the telling of the story.

The ETS Story Sequence Task, Part I (Melton, et al, 1968) requires the child to arrange a sequence of picture cards to match the events in the story being told. It was administered last year to a group of over 200 children (½ lower and ½ middle class) between 4-6 years of age. The results showed significant SES differences and a sex by age interaction; i.e., within the middle SES, the

girls were superior to boys at both age levels whereas in the low SES, the boys did better in the older group but there were no sex differences in the younger group.

Austin, M.L. In kindergarten through grades 3. Methods and Materials for Teaching Comprehension, Conference on Reading. Chicago: University of Chicago Press, 1960, 57-73.

Hildreth, G. Interrelationship among the language arts. Elementary School Journal, 48, 538-549.

Marsden, W. A study for the value of training in listening to achievement in reading. Unpublished doctor's field study, Colorado State College of Education, 1951.

Melton, R.S., Charlesworth, R., Tanaka, M.N., Rothenberg, B.B., Pike, L.W., Bussis, A.M., & Gollin, E.S. Research Memorandum 68-13, Princeton, N.J.: Educational Testing Service, 1968.

Name of Measure: ETS Story Sequence Task, Part II

Variables Measured: Speaking: retelling, comprehension and interpretation through oral reading and/or structured speech, creative speech

Status	Age-Grade Level					
	3½	4½	K	Gr.1	Gr.2	Gr.3
Ready to Go	X	X	X			
In Development						

Data Collection Method:

____ Group Test

____ Interview

X Individual Test

____ Observation

Estimated Administration Time (min.): 5-10 minutes

Brief Statement of Procedure: Two sets (3 and 4 cards each) of cartoon style sequences using animals as characters. E tells S to listen carefully to story because S is to repeat the "same" story. As the story is told, E places the appropriate cards in order in front of S. S's version of story is taped.

Minimum Requirements for the Administrator-Observer: Ability to use tape recorder

Supporting Statement: Although many studies of the language of culturally disadvantaged preschool children (e.g., Carson & Rabin, 1963; Loban, 1965) have reported greater lack of productive vs. receptive skills, most of the studies have used a single picture as a stimulus. If we assume that many of the later reading comprehension and interpretation skills involve the use of a connected series of sentences, it seems reasonable to look at the productive language which is elicited by a sequence of stimuli. John & Horner (1965) have made effective use of story-retelling in observing small samples of a wide variety of ethnic groups: N.Y. Negro (37), Calif. Negro (9), Puerto Rican (22), Mexican (10), Sioux Indian (16), and Navajo Indian (48). Again, however, the pictures used as stimuli were presented separately one at a time rather than adding each new picture to a series.

The proposed ETS measure (Melton, et al, 1968) was designed to measure the child's verbal recall of a story presented by the interviewer. The 1967 administration of this task to over 200 children (½ lower and ½ middle-class) of 4-5 years of age was scored in two ways: whether the child followed the original

sequence and whether the transition words were exact or appropriate transformations On the first type of comparison there were significant age differences and some apparent SES differences in the pre-K group. There were also no sex differences, but the analysis of the specific words used to "connect" one card to the next showed significant differences in favor of the girls and the middle SES group. In other words, the level of "productive" language indicated that there was no sex difference in the general ability to recall a story in the correct sequence, but there was a difference in the exact language used in telling the "same" story.

Carson, A. S., & Rabin, A. Verbal comprehension and communication in Negro and white children. Journal of Educational Psychology, 1960, 51, 47-51.

John, V., & Horner, V. The analysis of story-retelling as a measure of language proficiency. Paper presented at the Annual Meeting of the American Psychological Association, September, 1965.

Loban, W. Language proficiency and school training. In J. E. Krumboltz (Ed.), Learning and the educational process. Chicago: Rand McNally, 1965.

Melton, R. S., Charlesworth, R., Tanaka, M. N., Rothenberg, B. B., Pike, L. W., Bussis, A. M., & Gollin, E. S. Cognitive growth in preschool children. Research Memorandum 68-13, Princeton, N. J.: Educational Testing Service, 1968.

Name of Measure: Fixation Time

Variables Measured: Response decrement, stimulus differentiation, and amount of attending

Status	Age-Grade Level					
	3½	4½	K	Gr.1	Gr.2	Gr.3
Ready to Go	x					
In Development		x	x	x	x	x

Data Collection Method: ___ Group Test ___ Interview
x Individual Test ___ Observation

Estimated Administration Time (min.): 20 minutes running time

Brief Statement of Procedure: Four different sets of stimuli will be used. Each set has 7 trials of which the first 6 are the same and the 7th is some variation of the standard. Fixation time will be observed during presentation of these stimuli and shall be used for obtaining a measure of the above three variables. S will be seated behind a screen and shown the slides. S's behavior (fixation and smiling) will be observed and recorded by E using event recorders for permanent records. Response decrement is obtained by determining the function of the decrease in fixation over repeated trials. Stimulus differentiation is determined by obtaining the difference between the response on trial 6 and 7. Amount of fixation over all trials gives an estimate of amount of attending.
Minimum Requirements for the Administrator-Observer: Trained observer

Supporting Statement: By presenting an experimental design with a repeated event (S_1) and some variation (S_2), it is possible to obtain 3 different measures of attention: response decrement, stimulus differentiation, and amount of attention.

Response decrement measures the change is response strength to a repeated event (S_1) and has been found in a series of studies to be related to perceptual cognitive development. Response differentiation measures response recovery when a variation of the repeated event is presented (S_2). The difference between the last trial of S_1 and S_2 represents the discriminability between these 2 events. Finally, the mean amount of fixation time over all trials is a good estimate of amount of attending.

Four sets of S_1-S_2 events will be presented in order to observe stimulus differences. Stimuli will vary as a function of social, non-social, meaningful and incongruent. Also degree of S_1-S_2 difference will be varied so as to be able to obtain different levels of differentiation.

All these response measures have been shown to be related to individual differences in perceptual cognitive development.

Kagan, J., & Lewis, M. Studies of attention in the human infant. Merrill-Palmer Quarterly, 1965, 11, 95-127.

Lewis, M., Kagan, J., Kalafat, J., & Campbell, H. The cardiac response as a correlate of attention in infants. Child Development, 1966, 37, 331-341.

Lewis, M., Bartels, B., Campbell, H., & Goldgerg, S. Individual differences in attention: The relation between infants" condition at birth and attention distribution within the first year. American Journal of Disadvantaged Children, 1967, 113, 461-465.

Lewis, M., Goldberg, S., & Rausch, M. Attention distribution as a function of novelty and familiarity. Psychonomic Science, 1967, 7 (6), 227-228.

Lewis, M. & Goldberg S. The acquisition and violation of expectancy: An experimental paradigm. Journal of Experimental Child Psychology, in press.

Lewis, M. Infant attention: Response decrement as a measure of cognitive processes, or what's new, Baby Jane? Paper presented at The Society for Research in Child Development Meetings, Symposium on The Roles of Attention in Cognitive Development, New York, March 1967.

Lewis, M. Mother-infant interaction and cognitive development: A motivational construct. Paper presented at the National Institute of Child Health and Human Development, Symposium on Issues in Human Development, Philadelphia, November 1967.

Lewis, M. & Goldberg, S. Perceptual-cognitive development in infancy: A generalized expectancy model as a function of the mother-infant interaction. Paper presented at The Merrill-Palmer Conference on Research and Teaching of Infant Development, Detroit, February 1968.

Name of Measure: Form Memory (elements of the Johns Hopkins Perception Test and the Visual Perception Inventory with modified administration procedure).
Variables Measured: Form memory

Status	Age-Grade Level					
	3½	4½	K	Gr.1	Gr.2	Gr.3
Ready to Go						
In Development	x	x	x	x	x	x

Data Collection Method: ___ Group Test ___ Interview
x Individual Test ___ Observation

Estimated Administration Time (min.): 7 minutes

Brief Statement of Procedure: The standard stimulus is removed before presentation of the comparison stimuli.

Minimum Requirements for the Administrator-Observer: No special requirements

Supporting Statement: Memory is an integral element of reading and writing. This variable is included in order to have a measure of memory free of verbal facility.

Name of Measure: Fruit-Distraction Test

Variables Measured: Constricted vs. flexible control (resistance to interference or distraction)

Status	Age-Grade Level					
	3½	4½	K	Gr.1	Gr.2	Gr.3
Ready to Go						
In Development			x	x	x	x

Data Collection Method: ___ Group Test ___ Interview
x Individual Test ___ Observation

Estimated Administration Time (min.): 5-6 minutes

Brief Statement of Procedure: S must give the color of pictures of fruit, first in the absence of distracting stimuli, then with achromatic pictures of objects next to the fruits.

Minimum Requirements for the Administrator-Observer: Ability to follow directions, relate with the child, quickly record errors and record time. Little education required.

Supporting Statement: One of the cognitive styles (or controls) that has been inadequately investigated in children is constricted versus flexible control, a construct defined by Klein (1954) as reflecting the manner in which a person deals with a stimulus field containing information that potentially intrudes upon or distracts from the central task. The traditional measure of this variable has been the Stroop color-word interference task (Gardner et al. 1959; Jensen & Rohwer, 1966; Klein, 1954; Stroop, 1935), a test requiring the subject to first read color names, then to read off the names of a series of colors printed as colored patches, and finally to name the colors of the ink in which a series of color names are printed (for example, to say the work "red" when the word "blue" is printed in red ink). Various scores have been derived controlling for speed of reading the color names and for naming the colors of the color patches (see Jensen & Rohwer, 1966 for an exhaustive review of research on the Stroop Color-Word Test).

Since reading skills are not well established in early school years, Santostefano and Paley (1964) devised a measure, the Fruit-Distraction Test, that they hoped would tap the same kind of performance as the Stroop.

The test consists of two cards each containing, in random order, an array of appropriately colored fruit (red apples, green heads of lettuce, blue bunches of grapes, and yellow bananas). The two cards differ in that the second contains a variety of achromatic food and nonfood objects drawn adjacent to the relevant fruits. The task for the subject is to read off serially the colors of the fruits. The speed of naming the colors is recorded separately for the noninterference and interference (or distraction) conditions, and recordings are made of the intrusions of the nonrelevant stimuli. Immediately after completing the task the subject is asked to recall the irrelevant pictures that surrounded the fruit. The difference between reading times under interference and noninterference conditions is taken to be the index of distraction (or constricted control in Klein's terms). Santostefano and Paley found that interference effects (as measured by the reading time difference score) significantly decreased with increasing age (ages 6, 9, and 12), that the number of reading errors was unrelated to age, that the number of irrelevant food-related stimuli recalled decreased significantly with age, and that the number of non-food-related stimuli recalled was unrelated to age. Taken together the findings of more interference in the central task and better recall of irrelevant food-related stimuli among the younger children would fit the interpretation that they are less able to avoid attending to the task irrelevant stimuli. In another study, Santostefano (1964) administered this same test to samples of public school, institutionalized brain damaged, and orphaned children. Using analyses of variance and covariance (controlling for intelligence) it was found that reading time interference was greatest among the orphan children (who were residing in an orphanage but attending public schools), intermediate among the brain damaged, and least among the public school children. No significant differences were found in the recall scores or the error scores, and none of the scores was significantly related to intelligence (as measured by the WISC).

The above data are too limited to justify any broad generalizations as to their meaning. Whether performance on the Fruit-Distraction Test relates to performance on the Stroop color-word task remains to be shown, although it does seem reasonable to expect the two performances to be related. The two studies we have reviewed show the feasibility of using the Fruit-Distraction Test or an equivalent with six year olds. It may be possible to extend the test downward to $5\frac{1}{2}$ year olds (and perhaps though doubtfully, even younger Ss). The Stroop Color-Word Test on the other hand, is clearly inappropriate for ages where reading skills have not been established. The Stroop test has been successfully administered beginning at age 7 (Jenson & Rohwer, 1966). It thus seems reasonable to administer it at ages $7\frac{1}{2}$ and $8\frac{1}{2}$ with perhaps some testing at the $6\frac{1}{2}$-year level to establish a base on color-word performance. By administering both the Stroop and the Fruit-Distraction Test or a modification thereof at the ages where both are appropriate it will be possible to get some indication of the degree to which they are tapping the same factors of performance.

Having given considerable attention to the nature of the proposed measures, it may reasonably be asked what relevance the hypothesized dimension of performance has to the present study. Admittedly, there is

very little evidence at present as to just what susceptibility to interference in the present tasks is related. It does seem reasonable, however, that performance on such a measure should be related to the child's ability to maintain attention in a learning situation such as the classroom. Further, it is possible that an intermediate level of resistance to distraction may be desirable, with extremely high resistance resulting in being essentially "tuned out" to relevant but not completely central aspects of performance, and extremely low resistance resulting in inability to concentrate on task demands. The possibilities are worthy of investigation.

Santostefano, S. G., & Paley, E. Development of cognitive controls in children. Child Development, 1964, 35, 939-949.

Santostefano, S. G. Cognitive controls and exceptional states in children. Journal of Clinical Psychology, 1964, 20, 213-218.

Name of Measure: Gray Oral Reading Tests

Variables Measured: Listening: word recognition
Reading: word recognition
Speaking: word naming

Status	Age-Grade Level					
	3½	4½	K	Gr.1	Gr.2	Gr.3
Ready to Go				x	x	x
In Development						

Data Collection Method: ___ Group Test ___ Interview
x Individual Test ___ Observation

Estimated Administration Time (min.): 15 minutes

Brief Statement of Procedure: This test is a series of short reading passages, the first three of which are suitable for the end of grade 1 (difficulty--pre-primer, primer, and book I), the fourth and fifth are suitable for the end of grades 2 and 3, respectively. Passages 6 through 13 cover the difficulty range from grade 4 through adult. The reading passages are in a spiral-bound book. E introduces task to S. S reads aloud until seven or more errors are made on each of two successive passages. Time is recorded for the reading of each passage. Examples of "errors" are given in the manual.

Minimum Requirements for the Administrator-Observer: No special requirements

Supporting Statement: Most judgments of reading ability made by parents and the community at large are based on oral reading skill. With this in mind, oral reading was felt to be an important variable to measure. For a detailed discussion of the area, see section on Measures of Verbal and Quantitative Skills and Understandings and of General Knowledge.

Name of Measure: Gumpgookies

Variables Measured: Achievement-motivation
Cross reference: feelings of competency, work vs. non-work orientation, positive attitudes toward school.

Status	Age-Grade Level					
	3½	4½	K	Gr.1	Gr.2	Gr.3
Ready to Go		X	X	X	X	X
In Development						

Data Collection Method: ___ Group Test ___ Interview
X Individual Test ___ Observation

Estimated Administration Time (min.): 25-30 minutes

Brief Statement of Procedure: The instrument presents in story format 100 items that focus on the behavior of imaginary figures called Gumpgookies. In each item 2 Gumpgookies respond differently to a semi-structured situation providing dichotomous options designed to determine the strength of learned responses hypothesized to be the constituents of motivation to achieve. S is told that he has his own Gumpgookies and that although it looks like all the other Gumpgookies, it follows S around and behaves exactly as he behaves--it likes what S likes and it does what S does. The test appears in an 8½"X 11"book with illustrations of Gumpgookies on left-hand pages and the written story on right-hand pages. As E reads the story and points to each Gumpgookie as it is described, S is asked to watch carefully and point to his own Gumpgookie in each situation. Each item is scored one or zero: a score of one means that S responded in the direction assumed to indicate the presence of one of the response constituents of motivation to achieve Each set of items is preceded by four practice items in which the consistency between S's response and the response of his Gumpgookies is established by E.

Minimum Requirements for the Administrator-Observer: Ability to relate easily to young child and to maintain interest in task. Minimal training time required, but E should have practice with minimum of 10 preschool disadvantaged youngsters.

Supporting Statement: Motivation to achieve in school is considered a crucial variable in determining academic success (Adkins & Ballif, 1967; Cattell, Sealy, & Sweeney, 1966; Gordon & Wilkerson, 1966; Gray, Klaus, Miller, & Forrester, 1966; Kagan, 1966; Kagan, Sontag, Baker, & Nelson, 1958; Robinson, 1967; Sears, 1966), and is, therefore, often stated as one of the goals of Head Start programs. Evaluation of the successful realization of such a goal, however, relies on competency in teasing out the particular classroom variables affecting such behavior as well as on having a valid measure of the individual's motivation to achieve.

The major influence in the design of instruments that measure achievement motivation has been the work of McClelland and his associates, who use fantasy as the medium through which themes, needs, goals, and other variables are scored for achievement content. Despite the appeal of this procedure, research on its effectiveness is inconclusive due to the noncomparability of the operational definitions

used in the individual researches, the crudity of a method of measurement that allows possible intervention of other intellectural variables, and the serious conceptual dilemma as to whether or not achievement content in fantasy is reducible in operation to achievement behavior (Cofer & Appley, 1964; Klinger, 1966).

As Adkins and Ballif (1968) point out, further complications arise when these procedures are used with very young children. Preschoolers not only withdraw in the testing situation itself, but they also lack the verbal skills necessary to adequately describe their fantasy (Kagan, 1960). Consequently, Adkins and Ballif (1967) initiated an exploratory research project to identify procedures that would measure motivation to achieve in four- and five-year-old children. That study was successful in designing an instrument which can be used with preschool children and which holds promise as a measure of their motivation to achieve in school. A preliminary version of the proposed instrument consisting of 200 items was given to 200 4 and 5-year-old lower-class and middle-class youngsters. Item analysis assisted in the selection of the most promising 120 items, using both the total sample and a subsample of Head Start children identified as highly and lowly motivated to achieve. Factor analysis techniques eliminated an additional 20 items, provided some evidence for the seven-factor structure hypothetically underlying the responses (1. purposive responses; i.e., establishing school achievement as a goal; 2. ethical responses; i e., evaluating self-achievement as good conduct; 3. affective responses; i.e., expecting positive affect from achieving in school; 4. conceptual responses; i.e., conceptualizing self as an achiever; 5. cognitive responses; i.e., knowing instrumental behavior necessary for successfully achieving; 6. personal responses; i.e., possessing personal characteristics conducive to being motivated to achieve; and 7. social responses; i.e., possessing social skills that facilitate achievement motivation), and tentatively identified three second-order factors. Cross validation on a similar subsample was accomplished. Cross validation on varying ethnic and racial subsamples is currently in progress and the present instrument is being used in the national evaluation of Full Year 1968-69 Head Start programs.

Adkins, D. C., & Ballif, B. L. Exploration of motivation to achieve in preschool children. University of Hawaii Head Start Evaluation and Research Center Annual Report, 1966-67. Submitted to the Institute for Educational Development for the Research and Evaluation Division, Project Head Start, Office of Economic Opportunity.

Adkins, C., & Ballif, B. L. Measurement of Motivation to Achieve in Preschool Children. Final Report to OEO, Contract #4218, 1968.

Cattell, R. B., Sealy, A. P., & Sweeney, A. B. What can personality and motivation source trait measurements add to the prediction of school achievement? British Journal of Educational Psychology, 1966, 36, 280-295.

Cofer, C. N., & Appley, M. H. Motivation: Theory and research. New York: John Wiley and Sons, 1964.

Gordon E. W., & Wilkerson, D. A. Compensatory education for the disadvantaged. New York: College Entrance Examination Board, 1966.

Gray, S. W., Klaus, R. S., Miller, J. O., & Forrester, B. J. Before first grade. New York: Teachers College Press, 1966.

Kagan, J. Motivational and attitudinal factors in receptivity to learning. In J. Bruner (Ed.), Learning about learning. Washington, D. C.: U.S. Government, 1966, 34-39.

Kagan, J. Thematic apperceptive techniques with children. In A. I. Rabin and Mary R. Haworth (Eds.), Projective techniques with children. New York: Grune and Stratton, 1960, 105-129.

Kagan, J., Sontag, L. W., Baker, C. T., & Nelson, V. Personality and IQ change. Journal of Abnormal and Social Psychology, 1958, 56, 261-266.

Klinger, E. Fantasy need achievement as a motivational construct. Psychological Bulletin, 1966, 66, 291-308.

Robinson, H. B. The problem of timing in preschool education. In Supplement to the IRCD Bulletin, 3 (2A), 1967. New York: Yeshiva University.

Sears, P. Attitudinal and affective factors in children's approaches to problem-solving. In J. Bruner (Ed.), Learning about learning. Washington, D. C.: U.S. Government, 1966, 28-33.

Name of Measure: The Harrison-Stroud Reading Readiness Profiles, Test 6 Giving the Names of the Letters
Variables Measured: Speaking: letter naming

Status	Age-Grade Level					
	3½	4½	K	Gr.1	Gr.2	Gr.3
Ready to Go			X			
In Development						

Data Collection Method: ___ Group Test ___ Interview
X Individual Test ___ Observation

Estimated Administration Time (min.): 3-5 minutes

Brief Statement of Procedure: A printed 8½ x 11 card containing 42 of the possible 52 capital and lower case letters The ten which were eliminated are those capitals identical or almost so to their lower case forms. E points to each letter in turn and asks: "What is the name of this letter?" S must correctly name the letter but need not differentiate between lower and upper case.

Minimum Requirements for the Administrator-Observer: No special requirements.

Supporting Statement: The major reference concerning the importance of ability to identify letters by name is probably to be found in Chall (1965). On the basis of results from 17 correlational studies reported between 1938 and 1963, Chall concluded that "a child's ability to identify letters by name (letter knowledge) in kindergarten or the beginning of grade 1 is an important predictor of his reading achievement at various points in the first and second grades (r's from .3 to .9). In fact, letter knowledge has a generally higher association with early reading success than mental ability as measured by various intelligence tests and other tests of language and verbal ability (r's from .2 to .7)."

No reliability/validity indices reported in the test manual for this subtest. However, Weiner and Feldmann (1963) reported correlations of .70 (lower case) and .72 (upper case) between letter knowledge in October and grade 1 and paragraph reading (Gates) in June. Correlations of .76 (lower case) and .75 (upper case) were reported between letter knowledge in October and sentence reading (Gates) in June. The correlations are reported for an N of 126, 72 lower socio-economic and 54 middle socio-economic class.

Chall, J. Learning to read. New York: McGraw-Hill, 1965

Weiner, M., & Feldmann, S Validation studies of a reading prognosis test for children of lower and middle socio-economic status. Educational and Psychological Measurement, 1963, 23, 807-814.

Name of Measure: Harvard Story Completion Test

Variables Measured: Comprehension of syntactical structure (functor words)

Status	Age-Grade Level					
	3½	4½	K	Gr.1	Gr.2	Gr.3
Ready to Go						
In Development			X	X	X	X

Data Collection Method: X Group Test ____ Interview

X Individual Test ____ Observation

Estimated Administration Time (min.): 20 minutes (oral and written response)

Brief Statement of Procedure: The instruments being piloted are based on a technique used by Roger Brown and his associates at Harvard. S is presented with a simple one or two sentence "story" (facilitated with very young children by presenting a picture depicting what is said). E stops in the middle of a sentence after a functor word and has the child finish the "story." Examples: "Johnny spilled the water and _____"; "Johnny spilled the water, but _____."

Minimum Requirements for the Administrator-Observer: Accurate recording of verbal response.

Supporting Statement: The ability to comprehend syntactical structure is an important indication of language competence and of that aspect of language that is available to facilitate thought (see rationale, section C, in the main body of this report). The test has been used by Roger Brown and his associates at Harvard with samples of young children, but to date there has been no published data on the test.

Name of Measure: Head Start Inventory of Factors Affecting Test Performance (Ratings adapted from the Stanford-Binet Face-Sheet)
Variables Measured: Test-taking behaviors: degree of adverse effects of factors affecting test performance--response time, attention, persistence, feelings of competency, and ease with examiner, dependency, activity level, enthusiasm, verbalness and spontaneous verbalization. Cross-reference: interests, tolerance for frustration, impulsivity.

Status	Age-Grade Level					
	3½	4½	K	Gr.1	Gr.2	Gr.3
Ready to Go	X	X	X	X	X	X
In Development						

Data Collection Method: ___ Group Test ___ Interview
__X__ Individual Test ___ Observation

Estimated Administration Time (min.): 5 minutes (examiner time only)

Brief Statement of Procedure: Immediately following test administration, E makes ratings on the degree of adverse effect of a variety of factors, indicating the particular style in which the factor is expressed. For example, if E rates S's reaction time as adversely affecting his performance, he indicates whether S was impulsive or needed much urging to respond.

Minimum Requirements for the Administrator-Observer: Experience with characteristics of relevant age Ss on the particular task and training on the specific definitions for each scale point.

Supporting Statement: A review of past and present research activities leads one to conclude that although there is much discussion of the area of assessment of social-emotional development of the young child and its central importance, little is done about it. Measures to substitute for intensive observation in varied natural and structured situations are meager.

Under these circumstances careful attention to test-taking behaviors would be the most fruitful source of information concerning adult-child interaction, distractability, frustration-tolerance, preferential enjoyment for certain modes of response, etc. One attempt at such assessment involves use of the face-sheet ratings on the Stanford-Binet protocol. Modified so as to specify the nature as well as degree of response (confounded in the Binet procedure), these data should be useful for assessing the validity of the test responses as well as changes, if any, in child-test and child-examining adult interaction during the study. As

Zigler and Butterfield (1968) have indicated, such changes may account for obtained increases on tests attempting to assess cognitive functioning. What may appear to be a change in rate of intellectual development is at least partially due to a reduction in the effects of debilitating motivational factors. Moreover, the generality of such responses can be determined by relating them to observations in the classroom and reports by the mother.

Zigler, E., & Butterfield, E. C. Motivational aspects of changes in IQ test performance of culturally deprived nursery school children. Child Development, 1968, 39, 1-14.

Name of Measure: Hess and Shipman Eight-Block Sorting Task

Variables Measured: Maternal variables: teaching style--information-processing (use of feedback, orienting, specificity of directions); encouragement of verbalization (use of questions vs. commands); reinforcement strategies (relative use of affirmation and negation, praise, criticism). Cross-reference--linguistic variables; individuation; motivation (e.g., persistence). Child variables: cooperation, spontaneous verbalization; classification performance. Cross-reference--social motives; impulsivity; distractability; anxiety; response to frustration.

Status	Age-Grade Level						
	3½	4½	K	Gr.1	Gr.2	Gr.3	Mother
Ready to Go	x	x					x
In Development			x	x	x	x	

Data Collection Method: ___ Group Test ___ Interview
x Individual Test ___ Observation

Estimated Administration Time (min.): 15-60 minutes (Modal - 30 minutes)

Brief Statement of Procedure: Following a standardized instruction period whereby each mother is brought to the same learning criterion, she is observed attempting to teach her child to use 2 criteria simultaneously in sorting 8 blocks. The child is to learn to group together blocks of the same height (tall or short) and with the same mark (X or O), and to explain the reasons for these groupings. The mother is encouraged to teach by whatever method she thinks best and to take as much time as she wants, continuing to teach until satisfied with the child's learning. Upon concluding her teaching she is to summon E who will test the child's knowledge of the task by asking him to place new blocks in the appropriate group and to tell her why he placed them where he did.

Minimum Requirements for the Administrator-Observer:
Female of college level ability
Ability to: 1. give standardized instructions
2. establish rapport with adult and child
3. learn a coding procedure requiring careful observation.

Mother and child speech will be recorded. E will unobtrusively observe the interaction, tallying certain variables on the spot while rating others immediately afterwards. The child's test performance will yield placement and verbalization scores. At the beginning and end of the interaction period (with child absent) the mother will be asked to assess how well the child will do, and did do, as compared to his age group.

Supporting Statement: In a study focussed on the effect of environment on the development of the young child, delineation of the mechanisms of exchange that mediate between the individual and his environment is required. Considering the mother or mother surrogate as the most significant figure in the organization of the child's early experience, this task provides more detailed data on maternal behavior and the related responses of her child than that obtained in the interview. The sorting task is especially useful for studying the mother's ability to convey specific information to the child--her manner of presentation of the task, and her ability to discover and adjust to the child's difficulties or confusion. Viewing the mother as a teacher and the interaction between mother and child as a teaching and learning situation, the mother's strategies are likely to have consequences for the child's ability to grasp a concept or learn a lesson in other specific teaching situations. The mother's strategies also have consequences for the cognitive structures (preferred response patterns) that emerge in the child and for his eventual educability in more formal, institutional instruction. The degree to which styles of learning, established at home, facilitate or interfere with subsequent learning and teaching processes in school may be assessed.

Attending to the cognitive aspects of exchange and the cognitive consequences to the child of the affective and control strategies employed by the mother proved more useful to Hess and Shipman (1965, 1968) than traditional measures of IQ and social class in differentiating performance of four-year-old urban working-class Negro children on a variety of cognitive tasks. Moreover, the results from a follow-up study (Hess, Shipman, Brophy, and Bear, in press), when these children entered first and second grade, suggest that the effects of the mother's interaction with her child induce in him relatively enduring forms of information-processing. Some of the variables that particularly differentiated the good and the bad maternal teacher were: greater orientation to the task; reinforcement of correct responses more than errors; use of more specific language; less reliance on physical feedback; and, preference for motivating the child to controlling through implied threat. In addition, differences in verbal products indicated the extent to which the maternal environments of the subjects tended to be mediated by verbal cue, thus offering (or failing to offer) opportunities for labelling and adult models who can demonstrate the usefulness of language as a tool for dealing with interpersonal interaction and for ordering stimuli in the environment.

Arguing, according to Bernstein (1961), that the structure of the social system and the structure of the family shape communication and language, and that language shapes thought, and cognitive styles of problem solving, these maternal variables will be related both to contemporary indices of the mother's interaction with society's institutions, particularly the school, and to the child's functioning on various linguistic and cognitive measures proposed. As Hess and Shipman (1965) have shown, the use of restricted speech and status-oriented appeals is associated with the child's inability to use language as a cognitive tool as reflected in his difficulty in giving rationales in the interaction situations and on the classification measures.

The effects of early experience with these maternal strategies, however, are not only upon the communication mode and cognitive structure, they also establish potential patterns of relating with the external world. Of particular interest in assessing the child's educability will be to determine whether he takes an assertive exploratory approach to learning, as contrasted with a passive compliant mode of interaction, and whether he tends to reach solutions impulsively as distinguished from a tendency to reflect, to compare alternatives and to choose among available options. The use of restricted speech and of status-oriented appeals by the parent to the child which restrict the number and kinds of actions and thoughts possible precludes a tendency for the child to reflect, to consider, and to choose among alternatives for speech and action. This environment produces a child who relates to authority rather than to rationale, who, although often compliant, is not reflective in his behavior and for whom the the consequences of an act are largely considered in terms of immediate punishment or reward rather than future effects and long-range goals.

Bernstein, B. Social class and linguistic development. In A. H. Halsey, J. Floud, & A. Anderson (Eds.), Society, Economy, and Education. Glencoe, Ill.: Free Press, 1961.

Hess, R. D., & Shipman, V. C., Early experience and the socialization of cognitive modes in children. Child Development, 1965, 36, 869-886.

Hess, R. D. & Shipman, V. C. Cognitive elements in maternal behavior. Minnesota Symposium on Child Psychology, V. 1, Minneapolis: University of Minnesota Press, 1968.

Hess, R. D., Shipman, V. C., Brophy, J. E, & Bear, R. M. Cognitive environments of urban preschool children. Final Report to Children's Bureau, in press.

Name of Measure: Hess and Shipman Etch-a-Sketch Interaction Task; structured mother-child interaction task

Variables Measured: (See next page.)

Status	Age-Grade Level						Mother
	3½	4½	K	Gr.1	Gr.2	Gr.3	
Ready to Go	X	X	X				X
In Development				X	X	X	

Data Collection Method: ___ Group Test ___ Interview; X Individual Test X Observation

Estimated Administration Time (min.): 15-40 minutes; modal--251 minutes

Brief Statement of Procedure: Following a 3 minute practice period during which the use of the Etch-a-Sketch (a commercially available toy) is explained and demonstrated, the mother and child are asked to copy 5 simple geometric figures. The mother is told that she controls one knob while the child controls the other. She can give the child any directions or explanations she wishes but is not allowed to turn the child's knob herself or manually guide his hand. The subjects are allowed to attempt each of the five designs as many times as they wish, continuing until the mother accepts a given effort. Each attempt is traced by the experimenter while the subjects work on a fresh board. The tracings are later scored by crediting one point for each line that conforms to specifications. Prior to beginning each new figure, the mother is asked to predict the number of points they will earn working together. Below each model is written the number of points for a perfect copy of the design. This equals the number of lines in the figure. Mother and child speech will be recorded. E will tally certain variables and rate others after the testing session.

Minimum Requirements for the Administrator-Observer:
Female of college level ability.
Ability to: 1) give standardized instructions
2) establish rapport with adult
3) learn a coding procedure requiring careful observation.

Supporting Statement: Following the work of Hess and Shipman (1965, 1968), the relationship of maternal teaching styles to the child's cognitive performance and subsequent cognitive growth will be studied. Moreover, information is obtained on personal-social behaviors of the child which appear fruitful in assessing the child's educability.

The task was designed to emphasize the affective and control aspects of the mother-child interaction, thereby complementing use of sorting tasks which place a premium on information transmission. The kind of family control and regulation used manifests itself in the communication system between mother and child, and this interaction has decisive consequences for the child's cognitive development and subsequent educability. A multiple correlation utilizing the intelligence scores of the mothers and children and their social class produced a coefficient of .47, with the mother's IQ being the only significant predictor of the performance scores. When teaching measures (the mother's instructive use of the practice period, specificity of directions for turning the knob and use of the design models) were used, the multiple R obtained was .64. Use of all six variables listed below for the mother, produced a coefficient of .67. Thus, prediction from the three teaching

measures alone accounted for almost as much variance as an equation extended to include intelligence and social class measures.

These behaviors appear to be some of the ways through which cultural and social environments are mediated by maternal behavior into patterns of cognitive response on the part of the child. Hess and Shipman (1968) found that for many of their sample dyads, the child was being taught to produce responses that, for the child, were not related to any visible goal, were unrewarding in themselves, and did not bring corrective feedback that would enable him to avoid punishment Thus, if the mother fails to inject sufficient cognitive meaning into her interactions with her child, she may structure the interactions so that he not only fails to learn, but develops a negative response to the experience. According to Hess and Shipman, this kind of failure in communication is a primary factor in the interaction patterns of the culturally disadvantaged mother and child, and it has far-reaching and cumulative effects that retard the child's cognitive development.

The longitudinal nature of this study will enable us to determine the immediate and long-term effects of these maternal teaching styles, the extent to which such effects may be modified by intervention procedures and the degree to which the mother's mode of communication, being a socially determined behavior, reflects changes in her relations with the external world (e.g., through active participation in the Head Start program or community involvement).

Variables Measured:

Mother: adequacy of performance; use of practice period to teach; information-processing (use of feedback, orienting, use of model, specificity of directions); encouragement of verbalization; reinforcement strategies (relative use of affirmation and negation, praise, criticism); aspiration level. Cross-reference: linguistic variables.

Child: cooperation; spontaneous verbalization; adequacy of performance Cross-reference: social motives; impulsivity, distractability; anxiety; response to frustration.

Hess, R. D. & Shipman, V. C. Early experience and the socialization of cognitive modes in children. Child Development, 1965, 36, 869-886.

---------- Cognitive elements in maternal behavior. Minnesota Symposium on Child Psychology, University of Minnesota Press: Minneapolis, Vol. 1, 1968.

Name of Measure: Hess and Shipman Toy Sorting Task

Variables Measured: Maternal teaching style: information-processing (use of feedback, orienting, specificity of questions); encouragement of verbalization (e.g., use of commands vs. questions); reinforcement strategies (relative use of affirmation and negation, praise, criticism). Child: cooperation; spontaneous verbalization; classification ability.*

Status	Age-Grade Level						Mother
	3½	4½	K	Gr.1	Gr.2	Gr.3	
Ready to Go	X	X					X
In Development			X	X	X	X	

Data Collection Method:

___	Group Test	___	Interview
X	Individual Test	X	Observation

Estimated Administration Time (min.): 10-30 minutes (modal, 15 minutes)

Brief Statement of Procedure: Following a standardized instruction period for the mother conducted by E, the mother is observed attempting to teach her child to divide a group of toys into 3 groups by the criteria of kind (cars, spoons and chairs) and of color (red, yellow, green) and to explain the reasons for these groupings. The mother is encouraged to use any method she desires and to manipulate the toys as she wishes. She is encouraged to take as much time as she wants, continuing to teach until satisfied with the child's learning. Upon concluding her teaching, she is to summon E who will test the child's knowledge of the task. The test will be a repetition of the task, but the mother will no longer be allowed to assist the child in any way. Mother and child speech will be recorded. E will unobtrusively observe the interaction, tallying certain variables on the spot while rating others immediately afterwards. The child's test performance will yield placement and verbalization scores. At the beginning and end of the interaction period (with child absent) the mother will be asked to assess how well the child will do, and did do, compared to his age group.

Minimum Requirements for the Administrator-Observer: Female; college level ability; specifically, ability to: Give standardized instructions
Establish rapport with adult & child
Learn a coding procedure requiring careful observation

Supporting Statement: (See rationale for Eight-Block-Sorting task.) The major purpose of this task is to give the subjects a general acclimation to sorting tasks and to allow the mother to establish a routine in her functioning as teacher. In addition, however, it enables differentiation in the mother's teaching style when she is given a task that might be considered "natural" to her as it requires responses closely identified as school-relevant behaviors.

*Cross-reference--Mother: linguistic variables; individuation; motivation (e.g., persistence).
Child: social motives; impulsivity; distractability; anxiety; response to frustration.

Name of Measure: I-E Scale (Locus of Control)

Variables Measured: Locus of control

Status	Age-Grade Level					
	$3\frac{1}{2}$	$4\frac{1}{2}$	K	Gr.1	Gr.2	Gr.3
Ready to Go				x	x	x
In Development		x	x			

Data Collection Method:

____ Group Test ____ Interview

__x__ Individual Test ____ Observation

Estimated Administration Time (min.): 15-20 minutes

Brief Statement of Procedure: E presents S with different situations involving felt responsibilities for academic achievement and social peer relationships. S responds by selecting one of two choices read by E.

Minimum Requirements for the Administrator-Observer: Same as for other testers

Supporting Statement: It is proposed that risk taking and I-E are related. To test this, risk-taking tasks will be given to subjects who are old enough also to receive standard I-E scales. If there is a relationship between variables then a risk-taking task can be given to subjects too young for the scales.

Name of Measure: Ideational Fluency Tests

Variables Measured: Creativity

Status	Age-Grade Level					
	3½	4½	K	Gr.1	Gr.2	Gr.3
Ready to Go			X	X	X	X
In Development						

Data Collection Method: ___ Group Test ___ Interview

X Individual Test ___ Observation

Estimated Administration Time (min.): 20 minutes

Brief Statement of Procedure: S is asked to name all the possible uses he can for 4 common objects (newspaper, knife, cup, coat hanger) and then to name possible interpretations for 8 simple abstract patterns. Tests are administered in a permissive, game-like testing context without a time limit.

Minimum Requirements for the Administrator-Observer: After several hours of training and practice, anyone who is able to work skillfully and flexibly with young children would be suitable.

Supporting Statement: Following the report by Wallach & Kogan (1965), evidence has accumulated to show the existence of a dimension of individual differences to which the label "creativity" may reasonably be applied. This dimension is indexed by fluency and uniqueness of ideas that meet simple problem requirements; e.g., naming instances of a category (round things), listing possible uses for a common object (brick), and so on. Its appearance may depend on the administration of the tasks in a relaxed, game-like testing environment without short time limits (Wallach & Kogan, 1965; Kogan & Morgan, in press).

The studies mentioned above employed Ss of from 5th grade to college age. Ward (1968a,b; in press), using modifications of the Wallach & Kogan battery, has studied this variable in younger children. Evidence for the presence of the creativity dimension, including its clear separation from general intelligence, has been found with bright nursery school children; average ability and very bright kindergarten children; and with several early elementary school samples. Kindergarten age children, however, appear to be the youngest with whom adequate correlational data can be found without modification of the procedures: the present evidence for the existence of the dimension in bright nursery school children depends on a testing environment manipulation which would be difficult in the context of the longitudinal study; and testing of pilot Ss (middle class nursery school three year olds, lower class day care four olds,) suggests that

the measures require too much in the way of sustained verbal production to be useful with most children younger than kindergarten age.

Two subtests of the battery previously used with young children are to be included in the longitudinal study. Internal analyses of the data in hand indicate that this is a sufficient sample of items to provide reliable individual discrimination. (A still briefer sample would have the disadvantage that either tests with verbal content or tests with figural content would have to be omitted.) These tests are to be given first when the children are around $5\frac{1}{2}$, and to be repeated each year for the duration of the study. They will provide indices of ideational fluency, flexibility, and originality, as well as of the duration of sustained attention the child can devote to a comples task.

Kogan, N., & Morgan, F.T. Task and motivational influences on the assessment of creative and intellective ability in children. Genetic Psychology Monographs, in press.

Wallace, M. A., & Kogan, N. Modes of thinking in young children: a study of the creativity-intelligence distinction. New York: Holt, Rinehart & Winston, 1965.

Ward, W. C. Creativity in young children. Child Development, 1968, 39, 737-754. (a)

Ward, W. C. Rate and uniqueness in children's creative responding. Educational Testing Service Research Bulletin RB-68-36, September, 1968. (b)

Ward, W. C. Creativity and environmental cues in nursery school children. Developmental Psychology, in press.

Name of Measure: Illinois Test of Psycho-linguistic Abilities (Subtest: Auditory-Vocal Automatic)

Variables Measured: Speaking: application of knowledge of word and sentence properties

Status	Age-Grade Level					
	$3\frac{1}{2}$	$4\frac{1}{2}$	K	Gr.1	Gr.2	Gr.3
Ready to Go		x	x	x		
In Development						

Data Collection Method: ___ Group Test ___ Interview

_X_ Individual Test ___ Observation

Estimated Administration Time (min.): 5 - 10 minutes

Brief Statement of Procedure: S is shown a series of paired drawings. One member is described and the description of the other member is incomplete; e.g., "here is an apple; here are two _____". S is asked to provide the missing word(s). The use of correct grammar; i.e., inflectional endings, is observed.

Minimum Requirements for the Administrator-Observer: Accuracy in hearing and recording. The training program must insure that examiners who will give this test can make the necessary discriminations.

Supporting Statement: The area of language development may be considered in terms of language for social communication and language which is more directly involved in logical thinking. The latter aspect of language involves the manipulation of statement patterns according to grammatical and syntactical rules. It is in this area (Bernstein, 1961; Bereiter & Englemann, 1966) that the culturally disadvantaged child appears to be most heavily penalized.

The proposed measure (McCarthy & Kirk, 1963) was developed as a test of the psycholinguistic abilities of children between the ages of $2\frac{1}{2}$ and 9 years. It has been used successfully with a number of Head Start type populations (Bereiter & Engelmann, 1966; Gray & Klaus, 1965; Raph, 1965), and the Auditory-Vocal Automatic subtest has been shown to be sensitive to intervention programs.

Bereiter, C. & Engelmann, S. Teaching disadvantaged children in the preschool. Englewood Cliffs, N.J.: Prentice-Hall, 1966.

Bernstein, B. Social class and linguistic development: A theory of social learning. In A. H. Halsey, J. Floud, & C. A. Anderson (Eds.) Education, Economy, and Society. New York: Crowell-Collier, 1961.

Gray, S. W., & Klaus, R. An experimental preschool program for culturally deprived children. Child Development, 36, 1965, 887-898.

McCarthy, J. J., & Kirk, S. A. The construction, standardization, and statistical characteristics of the Illinois Test of Psycholinguistic Abilities. Madison, Wisc: Photo-Press Inc., 1963.

Raph, J. B. Language characteristics of culturally disadvantaged children. In M. Cowles (Ed.) Basic perspectives in the education of the disadvantaged. New York: World Publishing Co., 1967.

Name of Measure: Internality-Externality, modified version of Rotter--Shore's Parental Questionnaire

Variables Measured: Locus of control of reinforcements
Cross-reference: powerlessness

Status	Age-Grade Level						Mother
	3½	4½	K	Gr.1	Gr.2	Gr.3	
Ready to Go							X
In Development							

Data Collection Method:

____	Group Test	____	Interview
X	Individual Test	____	Observation

Estimated Administration Time (min.): 25-35 minutes

Brief Statement of Procedure: To be administered orally every year at time when mother comes to ETS testing center.

Minimum Requirements for the Administrator-Observer: Ability to relate easily and well to low-income adult. Female adult, preferably matched for race. Ability and willingness to adhere to standardized instructions.

Supporting Statement: To determine congruence with similar measure on child, the relationship to maternal control techniques, and their relation to the mother's alienation. See section on family.

Name of Measure: Johns Hopkins Perceptual Test

Variables Measured: Form discrimination--configurations

Status	Age-Grade Level					
	3½	4½	K	Gr.1	Gr.2	Gr.3
Ready t Go	X	X	X	X	X	X
In Development						

Data Collection Method: ___ Group Test ___ Interview
X Individual Test ___ Observation

Estimated Administration Time (min.): 10-15 minutes

Brief Statement of Procedure: S is presented with a stimulus and asked to point out the matching stimulus.

Minimum Requirements for the Administrator-Observer: No special requirements.

Supporting Statement: The discrimination of configurational differences is a skill which should be present in our earliest sample. If this ability is not developed to some minimum level, the child will probably not benefit from many aspects of the preschool program.

Correlations:

Middle SES

JHPT x PPVT* : .615, p .01, N = 50
JHPT x DAP ** : .702, p .01, N = 37
JHPT x CMMS*** : .798, p .01, N = 25

Lower SES

JHPT x PPUT : .449, p .01, N = 79
JHPT x DAP : .356, p .05, N = 36
JHPT x CMMS : .657, p .01, N = 78

*Peabody Picture Vocabulary Test
**Draw-a-Person
***Columbia Mental Maturity Scale

Test-retest reliabilities--17 days

15 year old examiner (N=22)	.864
24 year old examiner (N-39)	.933

Rosenberg, L. A. The Johns Hopkins Perceptual Test: Its development and current status as a measure of intellectual functioning. In press.

Name of Measure: Kreitler Cognitive Orientation

Variables Measured: Four cognitive content variables dealing with reactions to failure

Status	Age-Grade Level					
	3½	4½	K	Gr.1	Gr.2	Gr.3
Ready to Go		X	X	X	X	X
In Development						

Data Collection Method: ___ Group Test ___ Individual Test X Interview ___ Observation

Estimated Administration Time (min.): 15 minutes

Brief Statement of Procedure: The child will be interviewed individually according to a pre-determined list of questions about a set of themes concerning behavioral reactions to failure, e.g., fear, crying, anger, rebelliousness, denial, etc. The questions refer to beliefs (information, assumed facts, opinions, attitudes) along the following four cognitive content variables: Norms (beliefs about norms, rules, desirable standards); General Beliefs (beliefs about people, objects, environment); Beliefs about Self (beliefs about oneself, one's habits, feelings, behavior); and Goals (beliefs about desired or rejected future situations and objects). Total number of questions: 20

Minimum Requirements for the Administrator-Observer: Ability to establish rapport with children and interview them according to a guided interview schedule.

Supporting Statement: It is hypothesized that the answers of the child to the described questionnaire, i.e., the child's beliefs along the four cognitive content variables, will be predictive of the child's behavior in reaction to failure (see 'Observer ratings of children', Items Nos. 112-127). Beliefs along the four cognitive content variables have been used successfully to predict various kinds of behavior in children and adults, including post-failure behaviors in 15 year old children, and scholastic underachievement in 10 year old children (Kreitler & Kreitler, 1968). Investigating the relation between cognitive content variables and post-failure behavior in young children could contribute to a better understanding of children's reactions to failure, and thus provide a basis for producing future changes in maladjustive reactions to failure in a desired direction by changing beliefs along the four cognitive content variables. Because of the crucial impact of failure and reactions to failure on learning and performance (e.g., Stevenson & Pirojnikoff, 1958), improved understanding of post-failure reactions is particularly important in culturally deprived children, who may be assumed to be confronted rather often with experiences of failure, difficulties, and frustrations in formal learning tasks. In view of findings suggesting

(1) that the lower intellectual performance of disadvantaged children is due in large part to motivational variables rather than to cognitive ability factors (Zigler & Butterfield, 1968; Zigler & DeLabry, 1962), and (2) that values and opinions play a crucial role in the behavior and achievement of children (Crandal, Katkovsky, & Crandall, 1965; McGhee & Crandall, 1968; Rosen, 1959), an investigation of the cognitive determinants of reactions to failure may contribute to the attempts to better prepare culturally deprived children for the educational process.

References

Crandall, V. C., Katkovsky, W., & Crandall, V. J. Children's beliefs in their own control of reinforcements in intellectual-academic achievement situations. Child Development, 1965, 36, 91-109.

Kreitler, H., & Kreitler, S. Cognitive orientation: A model of human behavior. Unpublished Manuscript, 1968.

McGhee, P. E., & Crandall, V. C. Beliefs in internal-external control of reinforcements and academic performance. Child Development, 1968, 39, 91-102.

Rosen, B. C. Race, ethnicity and the achievement syndrome. American Sociological Review, 1959, 24, 47-60.

Stevenson, H. W., & Pirojnikoff, L. A. Discrimination learning as a function of pretraining reinforcement schedules. Journal of Experimental Psychology, 1958, 56, 41-44.

Zigler, E., & DeLabry, J. Concept-switching in middle-class, lower-class and retarded children. Journal of Abnormal and Social Psychology, 1962, 65, 267-273.

Zigler, E., & Butterfield, E. C. Motivational aspects of changes in IQ test performance of culturally deprived nursery school children. Child Development, 1968, 39, 1-14.

Name of Measure: Massad Mimicry Test

Variables Measured: Speaking: phoneme articulation, word articulation, application of knowledge of sentence properties

Status	Age-Grade Level					
	3½	4½	K	Gr.1	Gr.2	Gr.3
Ready to Go						
In Development	X	X	X	X	X	X

Data Collection Method: ___ Group Test ___ Interview

X Individual Test ___ Observation

Estimated Administration Time (min.): 10-20 minutes

Brief Statement of Procedure: Test is on tape and Ss' responses will be taped for evaluation. S will play a game like "Follow the Leader" and make a record of the game. They will repeat taped model utterances. Part I is to test the ability of S to reproduce phonemes upon hearing them once in a model. (Age 3½ through gr. 3) Part II^a is to test the ability of S to reproduce (A) word phrases and two simple sentences of the passive type, and (B) phonemes as they occur in given model word phrases. (Age 3½) Part II^b is to test the ability of S to reproduce (A) sentences in their functional type as given in a model, and (B) phonemes as they occur in given model sentences. (Age 4½ through gr. 3)

Minimum Requirements for the Administrator-Observer: Operate tape recorders--one with a microphone. Give positive reinforcement to subjects throughout the task.

Supporting Statement: Research by Slobin and Welsh (1967) and Fraser, Bellugi and Brown (1963) has indicated that an evaluation of children's linguistic competence may be made through controlled, elicited imitations. Stern (1966) found significant differences of language competency among children of various age levels and socioeconomic levels. However, information of the type to be found rendered by a longitudinal study is lacking in the literature on children's language competency. Therefore, an evaluation of children's language through a mimicry test of the kind proposed here for inclusion in the longitudinal study would provide needed information about how children's linguistic competence changes (or develops).

Both Part I and Part II^a will test developmental differences (among age levels) in the mimicry of phonemes. Part II^b, will test developmental differences (among age levels) in the mimicry of sentence types. It is believed that cultural differences may best be observed in the performance of Part II^a and Part II^b.

Nonsense words were selected for Part I for the following reasons:

(1) A maximum number of phonemes could be tested for in a minimum amount of time--an impossibility with meaningful words.

(2) Phonemes could maintain a discreteness not characteristic of meaningful utterances.
(3) Performance would be independent from experience in hearing or producing the phonemes because they exist in nonsense forms. Such a condition could remain constant throughout the project as nonsense words would not become a part of experience--possibly through schooling.

Word phrases were selected as the second section of this test for children between the ages $3\frac{1}{2}$ and $4\frac{1}{2}$ for the following reasons:

(1) The pretesting sample consisted of $2\frac{1}{2}$ to $4\frac{1}{2}$ year-old children from the low-socioeconomic level (these children being in day care centers, supported through public welfare funds). Results indicated that children at these age levels could not reproduce given model sentences. Usually, they reproducted only one word, usually the last word in the sentence.

(2) Word phrases were structured to test for the specific phoneme reproduction (that which occurs in normal speech) tested for in the sentences. Pretesting indicated that the children had no trouble reproducing the word phrases.

In addition to the word phrases, Part II[a] contains two short and simple sentences to test the ability of children to reproduce a sentence of the passive type. Past research has noted cultural differences in the use of the passive; and as a simple sentence could easily be structured in the passive, it was decided to admit two sentences to this part--one in the passive, the other representing the same meaning but in the active.

The mimicry test will measure the subject's ability to reproduce phonemes and sentence types as given in models--a maximum amount of developmental and cultural differences becoming evident as the project progresses.

Fraser, C., Bellugi, U., & Brown, R. Control of grammar in imitation, comprehension, and production. Journal of Verbal Learning and Verbal Behavior, 1963, 2, 121-135.

Slobin, D. I., & Welsh, C. A. Elicited imitation as a research tool in developmental psycholinguistics. An unpublished paper. University of California at Berkeley, 1967.

Stern, C. Language competencies of young children. Young Children, 1966, 22, 44-50.

Name of Measure: Matching Familiar Figures Test (version developed by Lewis, et al., 1968)
Variables Measured: Reflection-impulsivity

Status	Age-Grade Level					
	$3\frac{1}{2}$	$4\frac{1}{2}$	K	Gr.1	Gr.2	Gr.3
Ready to Go	X	X	X	X	X	X
In Development						

Data Collection Method: ___ Group Test ___ Interview
X Individual Test ___ Observation

Estimated Administration Time (min.): 10 minutes

Brief Statement of Procedure: S is shown a set of four pictures, then a single standard. His task is to identify the one comparison figure among the four that is identical to the standard. Response time and errors are recorded. Lewis version includes both meaningful and geometrical content in its 20 items.

Minimum Requirements for the Administrator-Observer: Anyone who can work well with young children would be satisfactory. Relatively little special training is required.

Supporting Statement: The child's ability to withhold or delay his own responses has been of interest to psychologists working in a variety of areas--for example, the psychoanalytic (problems of impulse control); social learning (delay of gratification); and cognitive development (the role of language in the regulation of behavior). In general there is little information on the interrelations of measures drawn from these various perspectives; but it is a reasonable guess that there is not a large degree of generality of performance across these possibilities, and that many measures will be needed to tap all the dimensions of delay that can be found.

The Matching Familiar Figures Test, is drawn from work on the response style "Reflection-impulsivity" (Kagan, Rosman, Day, Albert, & Phillips, 1964). Given a difficult perceptual matching-to-standard task, some individuals (impulsives) respond quickly and with a high probability of error; others (reflectives) respond more slowly and are more likely to be correct. In elementary school children, response times and errors have been found to be reliable across several tests for this style; errors are negatively related to both latencies and IQ scores; latencies

have minimal positive relations to IQ scores. (However, Lewis, Rausch, Goldberg, & Dodd, 1968, have presented reanalyses of published data to suggest that stylistic considerations are more important for behavior by males.) Reflection-impulsivity has been found, in early elementary children, to predict errors on tests of inductive reasoning (Kagan, Pearson, & Welch, 1966) and of word reading (Kagan, 1965), as well as categorizing style (Kagan, Moss, & Sigel, 1963).

Using simplified versions of the original tasks, this style is measurable in kindergarten children (Ward, 1968) and in three-year-old nursery school children (Lewis et al, 1968). Pilot work with three- and four-year-old lower class day care children indicates that the Lewis version of the task is quite appropriate for these children--19 of 20 children were able to understand and attempt the test; an adequate range of mean response times and error scores were obtained; and the expected negative relation between time and error scores was found. For older children other versions of the task, differing in difficulty, would be appropriate.

Kagan, J. Reflection-impulsivity and reading ability in primary grade children. Child Development, 1965, 36, 609-628.

Kagan, J. Moss, H. A., & Sigel, I. E. Psychological significance of styles of conceptualization. Monographs of the Society for Research in Child Development, 1963, 28, (2, Serial No. 86).

Kagan, J., Pearson, L., & Welch, L. Conceptual impulsivity and inductive reasoning. Child Development, 1966, 37, 583-594.

Kagan, J., Rosman, B. L., Day, D., Albert, J., & Phillips, W. Information processing in the child: significance of analytic and reflective attitudes. Psychological Monographs, 1964, 78, (1, Whole No. 578).

Lewis, M., Rausch, M., Goldberg, S., & Dodd, C. Error, response time and IQ: sex differences in cognitive style of preschool children. Perceptual and Motor Skills, 1968, 26, 563-568.

Ward, W. C. Reflection-impulsivity in kindergarten children. Child Development, 1968, 39, 867-874.

Name of Measure: Matching Familiar Figures Test; utilizing version appropriate for age and intellectual level
Variables Measured: Reflection-Impulsivity

Status	Age-Grade Level						Mother
	3½	4½	K	Gr.1	Gr.2	Gr.3	
Ready to Go							X
In Development							

Data Collection Method: ___ Group Test ___ Interview
X Individual Test ___ Observation

Estimated Administration Time (min.): 20 minutes

Brief Statement of Procedure: It is recommended that this task be administered at the testing center every other year beginning when the child is 4½. It is felt that formal testing of the mother should be delayed until the second year, after which time she has had the opportunity to become better acquainted with the project and staff.

Minimum Requirements for the Administrator-Observer: Female adult, preferably matched for race. Ability to relate easily and well to low-income adult. Ability and willingness to adhere to standardized procedures.

Supporting Statement: To assess congruence with similar measure on child, to determine assumed relationships to linguistic codes and maternal control and teaching techniques, and hypothesized effects on the child's behavior. See also supporting statement for children's version.

Name of Measure: Metropolitan Readiness Tests

Variables Measured: Test 1: recognition of word meaning, listening. Test 2: recall, listening; comprehension, listening; interpretation, listening. Test 3: item discrimination; word discrimination. Test 4: letter recognition. Test 5: number recognition; number writing; counting; number concepts; operation concepts; function and relation (comparison, simple ratio); measurement. Test 6: word copying; form copying.

Status	Age-Grade Level					
	3½	4½	K	Gr.1	Gr.2	Gr.3
Ready to Go			X			
In Development						

Data Collection Method: _X_ Group Test ____ Interview

____ Individual Test ____ Observation

Estimated Administration Time (min.): 35-60 minutes

Brief Statement of Procedure: It is suggested that for most valid results groups of no more than four or five Ss be tested at a given time. Tests 1, 2, 4, and 5 are timed item by item (Ss have 10-15 seconds per item after the specific directions are read by E). The time limits for Tests 3 and 6 are liberal and Ss work at their own pace. Except for the items which require production of numbers, letters, or figures, all responses are made by marking the correct answer with an "x."

Minimum Requirements for the Administrator-Observer: Ability to administer the tests according to detailed instructions in the manual. Administrator should be familiar to Ss and have the kind of voice they are used to listening to in school.

Supporting Statement: Readiness for first grade work is judged in many different ways but often emphasis is placed on the results of standardized "readiness" test results. As stressed in the text of this report, standardized measures allow for comparison of study results with those obtained by other investigators, comparison of characteristics of the study group to those of other known groups, and also allow for feedback of interpretable scores to local educational authorities. For the above reasons, it was decided that a standardized readiness test would be appropriate for use with the study subjects at the end of the kindergarten year. The Metropolitan Readiness Tests were selected because of coverage in the verbal area and the inclusion of the Numbers subtest (other readiness tests cover prereading skills alone) and because of evidence of effectiveness with Negro pupils (Mitchell, 1967).

Mitchell, Blythe C., Predictive validity of the Metropolitan Readiness Tests and the Murphy-Durrell Readiness Analysis for white and for negro pupils. Educational and Psychological Measurement, 1967, 27, 1047-1054.

Name of Measure: Mischel technique

Variables Measured: Ability to delay gratification

Status	Age-Grade Level					
	3½	4½	K	Gr.1	Gr.2	Gr.3
Ready to Go	X	X	X	X	X	X
In Development						

Data Collection Method: ____ Group Test ____ Interview

X Individual Test ____ Observation

Estimated Administration Time (min.): 2-5 minutes (depending on form used)

Brief Statement of Procedure: S is shown two "rewards"; is told he can have the smaller one now or the larger one at some later period (specified by E) and asked whether he wishes the smaller or larger.

Minimum Requirements for the Administrator-Observer: No special requirements.

Supporting Statement: First developed by Freud who linked the process of delay of gratification with development of attention, choice and other attributes of ego development, the concept has recently been studied (Mischel, 1961, Mischel & Metzner, 1962, Mischel & Gilligan, 1964) and the research indicates that the ability to delay is related to such variables as future time perspective, IQ, age and "social responsibility." One reason for including such a measure is that direct measures of future time perspective do not appear to be possible at any of the age levels to be tested.

Mischel, W. Preference for delayed reward and social responsibility. Journal of Abnormal and Social Psychology, 1961, 62, 1-7.

Mischel, W., & Metzner, R. Preference for delayed reward as a function of age, IQ, and length of delay interval. Journal of Abnormal and Social Psychology, 1962, 64, 425-431.

Mischel, W., & Gilligan, C. Delay of gratification, motivation for the prohibited gratification and responses to temptation. Journal of Abnormal and Social Psychology, 1964, 69, 411-417.

Name of Measure: Modified Hertzig et al Procedure, for assessing response to cognitive task demands

Variables Measured: Test-taking behaviors: Response to cognitive task demands academic achievement orientation (work-nonwork preference); differential work response to verbal and nonverbal tasks; spontaneous verbal and nonverbal extension; differential nonwork responses (e.g., refusalsubstitution). Cross-reference-- dependency, passivity, distractibility, interests.

Status	Age-Grade Level					
	$3\frac{1}{2}$	$4\frac{1}{2}$	K	Gr.1	Gr.2	Gr.3
Ready to Go	X	X	X	X	X	X
In Development						

Data Collection Method:

____ Group Test
X Individual Test
____ Interview
X Observation

Estimated Administration Time (min.): No administrator time; coding done later.

Brief Statement of Procedure: Translation of scores to Hertzig codes is to be accomplished after the particular test has been scored. The nature of the information being coded in the Hertzig system can be presented in terms of a series of questions that the system asks: (1) Did S work (i.e., attempt to do what was asked of him) or not work? (a) If S worked, did he elaborate his response to the task (spontaneous extension) or did he stick to the defined limits of the task (delimitation)? (b) Were S's work responses elicited equally by items demanding a verbal response and by items calling for a nonverbal response? (2) If S did not work, was his response in the form of verbal behavior or nonverbal behavior? (a) If S's not work response was verbal, could it be classified in terms of competence (e.g., "I don't know"), negation (e.g., "I want to play with the toys"). (b) If S's not work response*(e.g., complete passivity, shaking head, shrugging shoulders) or did the child carry out some motor substitution (e.g., leave the table and play with other material in the room).

Minimum Requirements for the Administrator-Observer:

Alert, objective, trainable on standardized procedures; no special education requirements.

Supporting Statement: This system is an attempt to objectively describe behavior in response to cognitive demands independent of achievement. The original coding system was based on information obtained from observers' detailed recording of the behavior and verbalizations of $3\frac{1}{2}$-year-old middle-class native white children and working-class Puerto Rican children during the administration of the Stanford-Binet. Subsequently, attempts have been made to use one examiner to simultaneously administer the Binet and to code the child's behavior in terms of the Hertzig et al (1968) system.

Experience has led to the conclusion that the use of one examiner for this purpose is not feasible, especially as part of a wide-scale national study. The demands on the examiner (cognitive and otherwise) when administering the Binet or similar task to preschoolers are extensive and, therefore, additional examiner requirements should be kept to a minimum. The system has been revised so that the essential information from the Hertzig system is maintained while at the same time reducing the demands on the examiner. A thorough and carefully recorded test administration, with a few specified additions, should provide the information necessary to code the modified Hertzig system.

* was nonverbal, did it fall in the general category of no response

For the minimal staff time required, highly significant data should be obtained. Using a gross measure like IQ, we may expect only slight changes resulting from preschool intervention programs such as Head Start. (The 1966-67 National evaluation of year-round Head start programs indicated an average "true" gain score of 4 points.) Sensitive indicators of test-taking behavior, however, may indicate that those children who do experience intervention programs in the preschool years may become increasingly work-oriented and verbal in their response to cognitive demands, behaviors which enable them to be more accessible to and approved by the teacher and are thereby predictive of greater school success.

It is our recommendation that these indices of test taking behaviors be utilized with a variety of measures, not just with the Binet (or similar substitute task). It should prove useful to assess differential responses, if any, to diverse response demands (e.g., perceptual, gross motor, verbal).

Hertzig, M. E., Birch, H. G., Thomas, A., & Mendez, O. A. Class and ethnic differences in the responsiveness of preschool children to cognitive demands. Monograph of the Society for Research in Child Development, 1968, 33, No. 1.

Name of Measure: Motor Inhibition

Variables Measured: Impulsivity

Status	Age-Grade Level					
	3½	4½	K	Gr.1	Gr.2	Gr.3
Ready to Go	X	X	X	X	X	X
In Development						

Data Collection Method: ___ Group Test ___ Interview
X Individual Test ___ Observation

Estimated Administration Time (min.): 5 minutes

Brief Statement of Procedure: Child performs three motor acts--drawing a line between two points, walking a distance of 6 feet, and winding a car up to the rear of a toy tow truck. He practices each act and then is timed as he performs it as slowly as he can.

Minimum Requirements for the Administrator-Observer: Anyone who can work well with young children would be satisfactory. Little special training is required.

Supporting Statement: The Motor Inhibition Ability Test was introduced by Maccoby, Dowley, Hagen, & Degerman (1965). Here the child is asked to perform three simple motor acts as slowly as he can. Reliability of individual subtests and their intercorrelations are substantial. Pretest results with 24 three- and four-year-old lower class day care children show that all children were able to understand and attempt the tasks; interest was high; and adequate intertask correlations were found. The highest intercorrelation was rho = .53 for the walk and truck subtests. Since other investigations show the draw-a-line subtest to be the best representative of the dimension, and since each subtest requires less than 2 minutes, it seems most reasonable to include all subtests in the battery and, if necessary, to decide later to discard one of the scores.

Several investigations have found a substantial positive relation between time scores on the Motor Inhibition Ability Test and IQ (Maccoby et al., 1965, with bright four-year-olds; Hayweiser, Massari, & Meyer, 1967, with Head Start children; Ward, 1968, with eight-year-olds). There are several possible explanations for this finding: the ability to delay response may be a component of general intelligence; an impulsive style may lead to maladaptive test-taking behavior;

less intelligent children may fail to understand the direction to act slowly. (Hayweiser et al., 1967, present data and arguments to claim that failure to understand is not importantly operative.) Bussis, Orost, Papanek, & Tanaka (in preparation) suggest an additional possibility. They found, with lower class kindergarten children, that improvements in classification ability as a result of a classroom instruction procedure were significantly related ($r = .41$) to preexperimental time scores on the draw-a-line subtest. Their preferred explanation hinges on the observation that, whenever a subgroup of children was used in demonstrating uses of materials during training, those children with high motor control scores were likely to be chosen for direct work with teacher and materials, while others often had to learn by observation. Thus, the child's style of behavior may affect the learning opportunities to which he is exposed.

Motor inhibition ability and reflection-impulsivity are clearly not the same dimension; correlations between scores for the two sets of tests seem to be on the order of .35 (Banta, 1968; Ward, 1968), substantially less than the reliability of either measure.

Banta, T. J. Tests for the evaluation of early childhood education: The Cincinnati Autonomy Test Battery (CATB). To appear in Vol. 1 of Cognitive Studies, 1968, mimeo.

Bussis, A., Orost, J., Papanek, M., & Tanaka, M. Teaching classification concepts to disadvantaged children. Educational Testing Service Research Bulletin, in preparation.

Hayweiser, L. Massari, D., & Meyer, W. J. Evaluating behavioral change during a six-week pre-kindergarten intervention experience. Report (submitted to the Institute for Educational Development) of research supported by OEO Head Start subcontract #1410. November 1967, mimeo.

Maccoby, E. E., Dowley, E. M., Hagen, J. W., & Degerman, R. Activity level and intellectual functioning in normal preschool children. Child Development, 1965, 36, 761-770.

Ward, W. C. Creativity in young children. Child Development, 1968, 39, 737-754.

Name of Measure: Naming Category Instances

Variables Measured: Creativity.

Status	Age-Grade Level					
	3½	4½	K	Gr.1	Gr.2	Gr.3
Ready to Go		X	(X)			
In Development						

Data Collection Method: ___ Group Test ___ Interview

_X_ Individual Test ___ Observation

Estimated Administration Time (min.): 15 minutes

Brief Statement of Procedure: The test will be conducted in a prepared environment which offers S cues to possible responses. The first concept, things that are "little," will be used as a training exercise. S and E will alternate in naming things that are little (E will read options from a standard list), thus allowing modeling of the appropriate task behavior and reinforcement of S's efforts. S then names as many things as he can that are "round." S receives ample praise and support as he performs. No time limit is imposed.

Minimum Requirements for the Administrator-Observer: After several hours of training and practice, anyone who is able to work skillfully and flexibly with young children would be suitable.

Supporting Statement: A rationale for the measurement of creativity through two tests of ideational fluency was given elsewhere in this appendix. It was indicated there that those procedures are inappropriate for children below kindergarten age, in part because of the largely verbal nature of the task, and possibly also because of difficulties in bringing the child to understand that he is to give as many ideas as he can. However, the need for continuity in measures over the age range included in the longitudinal study makes desirable some effort to obtain a closely related measure with younger children. The procedure described here attempts to overcome the two problems described above to provide a verbal ideational fluency measure in $4\frac{1}{2}$ year old children. It is to be repeated at kindergarten age *

The reduction of verbal problems is accomplished by asking for ideas in response to the simplest and most familiar of the kinds of questions that have been asked in assessing the creativity dimension in older children. The child will be asked to name things that are "little" and things that are "round." Several concrete examples of each of these concepts will be demonstrated at the appropriate point in the task, and in addition several obvious exemplars of each will be present in the testing environment. It has been shown (Ward, in press) that, if young children are given such environmental support, those whose response output is most augmented are those who would otherwise have been labeled as higher in creativity.

* to allow direct comparison with the Ideational Fluency Tests which are first given them.

The task will provide the same measures available from older children--fluency, flexibility, and originality of ideas, plus the time during which the child can give sustained attention to a cognitive task. Chief interest will be in examining the relations of these measures to their analogues in older children. Additionally, it will be possible to search for individual and educational variables which influence either the level of performance or the degree of relationship between early and later performance.

Ward, W. C. Creativity and environmental cues in nursery school children. Developmental Psychology, in press.

Name of Measure: Northwestern University Interest Inventory (ETS adaptation)

Variables Measured: Interests

Status	Age-Grade Level					
	3½	4½	K	Gr.1	Gr.2	Gr.3
Ready to Go						
In Development			X	X	X	X

Data Collection Method: ____ Group Test ____ Individual Test _X_ Interview ____ Observation

Estimated Administration Time (min.): 30 minutes

Brief Statement of Procedure: child interview

Minimum Requirements for the Administrator-Observer: Training in procedure

Supporting Statement: A structured interview involving teacher-pupil discussions of hobbies, leisure activities, play preferences, reading interests, radio/movie/ television habits, and also questions relating to the child's personal and social problems.

Name of Measure: Open Field Test

Variables Measured: Social motives, creativity, distractibility, habituation, amount of attention, planfulness, vulnerability to frustration, coping styles, and interests

Status	Age-Grade Level					
	3½	4½	K	Gr.1	Gr.2	Gr.3
Ready to Go						
In Development	X	X	X	X	X	X

Data Collection Method: ___ Group Test ___ Interview

X Individual Test ___ Observation

Estimated Administration Time (min.): 20 minutes

Brief Statement of Procedure: S is placed in a standardized but relatively unstructured free play situation, with E present but unobtrusive. S's behavior is recorded in detail by two or more persons in the room.

Minimum Requirements for the Administrator-Observer: Observers would require extensive training.

Supporting Statement: It is possible that in certain children, the current impact of the mother-child relationship and/or classroom atmosphere tends to suppress certain behavior potentials which could have a favorable (or unfavorable) influence upon later educational growth. It is therefore proposed that an "open field test" be included as a multi-purpose assessment procedure for tapping the child's coping styles and strategies in a semi-structured play situation that is free of certain everyday constraints.

The observations will be made in a room containing a standardized array of toys, objects, and tasks. These materials will differ on a variety of dimensions, such as sex-role appropriateness and complexity. The examiner will encourage the child to play freely, and remain (unobtrusively) with the child for about 20 minutes. A variety of personal-social and cognitive measures can be catologued during this period, including the number of different objects played with, the length of time spent playing with certain objects, the child's approach to each task (e.g., whether he applied manipulative or analytic skills), and the nature of his social response to the adult.

Name of Measure: Parent Interview

Variables Measured: (See below)

Status	Age-Grade Level						Adult
	3½	4½	K	Gr.1	Gr.2	Gr.3	
Ready to Go							X
In Development							

Data Collection Method: ___ Group Test X Interview
___ Individual Test ___ Observation

Estimated Administration Time (min.): 75-120 minutes, modal--90 minutes

Brief Statement of Procedure: During an earlier brief interview, the mother will be given a general explanation of the study and the procedures involved. The interviewer will arrange an appointment time agreeable to the mother, not walk in unexpectedly. The field coordinator will assist when there are continued missed appointments requiring more concentrated effort in delineating and resolving the interfering factors.

Minimum Requirements for the Administrator-Observer: Adult females, preferably mothers and matched by race. Sensitivity and ease in relating to low-income adult; willingness and ability to use standardized instructions; ease in physical environment of low-income neighborhood; interest in study; willingness to take neutral role.

Supporting Statement: See section on Family Variables for rationale.

Variables Measured:

Status: Number, age, sex, and race of household members; parental birthplace, age, education, occupation, and language spoken; mobility; welfare status; physical characteristics of dwelling and surroundings; home resources (books, records, toys, car, phone, radio, TV)

Process: Alienation-participation in community life; maternal control strategies; attitudes toward education and the schools; feelings of powerlessness; knowledge and utilization of community resources; interest in educational activities (reading, taking courses, sending child to preschool, etc.); achievement expectations and aspirations for child, individuation of child on social-personal and school relevant characteristics

Interviewer ratings (verbal facility; cooperation; when applicable, parent-child interaction ratings of support and pressure)

Name of Measure: Peabody Picture Vocabulary and ETS Adaptation

Variables Measured: Recognition of word meaning, listening (receptive skill), labeling, speaking (productive skill)

Status	Age-Grade Level					
	3½	4½	K	Gr.1	Gr.2	Gr.3
Ready to Go	X	X				
In Development						

Data Collection Method:

___ Group Test ___ Interview

_X_ Individual Test ___ Observation

Estimated Administration Time (min.): 20 minutes

Brief Statement of Procedure: S is asked to select (point to) the correct picture of the word spoken by E. In addition, S will be asked to produce the label for 20 items.

Minimum Requirements for the Administrator-Observer: Familiarity with test materials---practice giving the test prior to its use as a standardized measure. Knowledge of the "correct" (standard English) pronunciation of the words to be tested.

Supporting Statement: John and Goldstein (1964) and Stern (1966) indicated a relationship between socioeconomic status and verbal ability, specifically the ability to recognize pictures of a given word from among four options. Such findings indicate the need to determine when and how this language ability develops. Therefore, the inclusion of the Peabody Picture Vocabulary Test in the longitudinal study would provide needed information about vocabulary development in very young children.

The hypothesis to be tested by the inclusion of the Peabody Picture Vocabulary Test in this study would be: There are significant differences of vocabulary development among children of differing age levels, socioeconomic levels, and educational levels.

In separate investigations, we are looking at the effects on performance of (a) race of people pictured and (b) illustrations closer to the experiences of disadvantaged children. If the results are significant, new versions of the test (equated statistically to present version) will be administered in 1970.

John, V.P. & Goldstein, L.S. Social context of language acquisition. Merrill-Palmer Quarterly of Behavior and Development, 1964, 10, 265-275.

Stern, C. Language competencies of young children. Young Children, 1966, 22, 44-50.

Name of Measure: **Performance Ratings For School Principals**

Variables Measured: **Principal performance ratings**

Status	Age-Grade Level					
	3⅓	4⅓	K	Gr.1	Gr.2	Gr.3
Ready to Go						
In Development						

School Superintendent	Principal
X	X

Data Collection Method:

____ Group Test
____ Interview
__X__ Individual Test
____ Observation

Estimated Administration Time (min.): **5-10 minutes**

Brief Statement of Procedure: **An evaluation of the principal on eleven general performance factors. Responses are made according to a six-choice scale.**

Minimum Requirements for the Administrator-Observer: **Self-administered**

Supporting Statement: **This instrument will provide an assessment of the principal's performance as judged by the school superintendent as well as by the principal himself.**

Hemphill, J. K., Griffiths, D. E., & Frederiksen, N. Administrative performance and personality. New York: Bureau of Publications: Teachers College, Columbia University, 1962.

Name of Measure: Physical Examination

Variables Measured: Medical status

Status	Age-Grade Level					
	3½	4½	K	Gr.1	Gr.2	Gr.3
Ready to Go						
In Development	X	X	X	X	X	X

OEO form CAP-HS-31 being adapted and expanded.

Data Collection Method: ___ Group Test ___ Interview

_X_ Individual Test ___ Observation

Estimated Administration Time (min.): 20 minutes

Brief Statement of Procedure: Child will be examined individually with parent and aide in attendance. Specific information to be reserved for study purposes only; recommendations for further examination or treatment will be given to parent.

Minimum Requirements for the Administrator-Observer: Doctor of medicine licensed to practice in the study site. (Child statistics such as height and weight will be obtained by paramedic or aide.)

Supporting Statement:

Name of Measure: Physical Identity and Sex Role Constancy Tasks

Variables Measured: Qualitative conservation (identity)

Status	Age-Grade Level					
	3½	4½	K	Gr.1	Gr.2	Gr.3
Ready to Go						
In Development	x	x	x	x	x	x

Data Collection Method: ___ Group Test ___ Interview
x Individual Test ___ Observation

Estimated Administration Time (min.): 5-10 minutes

Brief Statement of Procedure: S is presented a series of stimuli which portray objects that differ from a standard in increasingly greater ways. The number of transformations tolerated before saying that the underlying object is changed is a measure of qualitative conservation or identity.

Minimum Requirements for the Administrator-Observer: Trained in procedure

Supporting Statement: Recent discussions of Piagetian conservation tasks have pointed out the importance of the child's conception of identity; i.e., maintenance of an object's essential character or meaning despite qualitative transformations (Elkind, 1967; Kohlberg, 1966; Piaget, 1968). The importance of this variable for this study arises in two ways. First, in Piaget's view, object identity is a qualitative precursor to true conservation, the latter presumably requiring quantitative operations of compensation and reversibility. We would therefore expect the qualitative identities to emerge earlier in the child's development than the conservations and indeed to serve as necessary prerequisites for the development of quantitative conservations. Secondly, the attainment of object identity in Piaget's sense has recently been translated into the personal-social domain (Kohlberg, 1966), with the suggestion that the development of gender identity may be an early and important precursor of sex-role development. Moreover, recent work with older children (5-8) on the maintenance of role identity despite role transformations suggests that suitable instrumentation can be developed at all agres in the study (Sigel, Saltz, & Roskind, 1967). Such measures

would signify not only the level of the child's cognitive development but would also relate to his level of personal-social maturity, providing evidence for a cognitive theory of personality development (Kohlberg, 1966).

Elkind, D. Piaget's conservation problems. Child Development, 1967, 38, 15-27.

Kohlberg, L. A cognitive-developmental analysis of children's sex-role concepts and attitudes. In E. E. Maccoby (Ed.), The development of sex differences. Stanford, Calif.: Stanford University Press, 1966, 82-173.

Piaget, J. On the development of memory and identity. Barre, Massachusetts: Clark University Press, 1968.

Sigel, I. E., Saltz, E., & Roskind, W. Variables determining concept conservation in children. Journal of Experimental Psychology, 1967, 74, 471-475.

Tanaka, M. N. Preliminary analysis of Human-Animal-Thing (HAT) Task. (Unpublished manuscript).

Name of Measure: Picture Block Test

Variables Measured: Concept formation--ability to abstract or analyze the common property of a given grouping (category) and select another item with a similar property that belongs with the group; verbal ability--ability to describe why the group goes together (some items only)

Status	Age-Grade Level					
	$3\frac{1}{2}$	$4\frac{1}{2}$	K	Gr.1	Gr.2	Gr.3
Ready to Go						
In Development		X	(X)			

Data Collection Method: ___ Group Test ___ Interview
_X_ Individual Test ___ Observation

Estimated Administration Time (min.): 10-15 minutes

Brief Statement of Procedure: The measure consists of 4 blocks with a picture pasted on each side. E puts 3 blocks in a box (so only the top picture is visible to the child) and says the pictures "go together" for some reason. The child is asked to find a picture on his answer block that goes with the other three. On some items he is questioned about his selection of a picture ("why do these go together?").

Minimum Requirements for the Administrator-Observer: Accurate recording of picture selected and reasons given; ability to encourage children to give reasons.

Supporting Statement: Developed as a criterion measure for a classification instruction study and administered to lower class kindergarten children.

Name of Measure: Picture Completion: WPPSI and WISC

Variables Measured: Analytical functioning

Status	Age-Grade Level					
	$3\frac{1}{2}$	$4\frac{1}{2}$	K	Gr.1	Gr.2	Gr.3
Ready to Go	X	X	X	X	X	X
In Development						

Data Collection Method:

____ Group Test
X Individual Test
____ Interview
____ Observation

Estimated Administration Time (min.): 5 minutes

Brief Statement of Procedure: Child is shown drawings with part of a figure missing (e.g., a wagon with a wheel missing) and must indicate what part is missing.

Minimum Requirements for the Administrator-Observer: Very little special skill is required beyond ability to establish rapport with the child and be sure he understands the task.

Supporting Statement: The Picture Completion subtest of the Wechsler Preschool and Primary Scale of Intelligence (WPPSI) is a downward extension of the identically named subtest of the Wechsler Intelligence Scale for Children (WISC). Half of the items are taken directly from the WISC and half are new (Wechsler, 1962).

In studies by Goodenough and Karp (1961) and by Cohen (1959), the Picture Completion subtest loaded on the analytical functioning factor of the WISC. Measures of analytical functioning and their importance have been discussed in some detail in the body of this report (see "measurement of analytical functioning" section) so only a few additional points will be made here. Since this test is suitable for administration over the entire age range included in this study (with some slight modification probably appropriate at the youngest age level) it will be possible to examine in detail the developmental trend in performance on the test. It is also one of the tests being administered to the mothers of our subjects (see rationale for WAIS subtests) and it will be of some interest to see whether the child's performance is related to that of his mother. Finally, and perhaps not of least importance, the test takes only three or four minutes to administer and is enjoyed by the children.

Cohen, J. The factorial structure of the WISC at ages 7-6, 10-6, and 13-6. Journal of Consulting Psychology, 1959, 23, 285-299.

Goodenough, D. R., & Karp, S. A. Field dependence and intellectual functioning. Journal of Abnormal and Social Psychology, 1961, 63, 241-246.

Wechsler, D. Wechsler Preschool and Primary Scale of Intelligence, manual. New York: Psychological Corporation, 1962.

Name of Measure: Play Situation-Picture Board Sociometric Technique

Variables Measured: Peer preference: "star" - "isolates"

Status	Age-Grade Level					
	3½	4½	K	Gr.1	Gr.2	Gr.3
Ready to Go		X	X			
In Development				X		

Data Collection Method: ___ Group Test ___ Interview
X Individual Test ___ Observation

Estimated Administration Time (min.): 15 minutes

Brief Statement of Procedure: This task requires only nonverbal responses. A set of five stimulus pictures would be used, portraying play situations and play activities. The five pictures of play situations would be presented to S, and S would be asked to select the three play situations he prefers. These would then be presented to S (in order of his preferences for the activities), with his own picture attached in an appropriate position in the picture; e.g., above one of two ponies. S would then be asked to select from photographs of his peers the picture of the child he would most like to play with in the activity portrayed. His actual behavior response in selecting a picture from the group would provide his sociometric choice response. This would be repeated for each of the three situations selected.
Minimum Requirements for the Administrator-Observer: Ability to establish rapport with young child and to follow standardized instructions: no special education required.

Supporting Statement: The child's ability to relate effectively to others in his peer group is a significant variable in early social development, and has been shown to be related to subsequent interaction and social adjustment. A child who initially is unable to socialize effectively is in turn ignored or rejected and in the interim may adopt aggressive coping mechanisms or withdraw further from social interaction. Increased knowledge of socialization patterns in the classroom would, therefore, seem to be helpful in understanding the behavior and behavior change of these children.

Peer group acceptance or rejection within preschool groups has been studied in a variety of ways, with what in all fairness might be called "limited" success. Systematic observation of peer interaction is one technique that has been used successfully and will be utilized in this study according to the schemata proposed by Medley and Emmerich (see Chapters D and G). In addition, it is here proposed that a sociometric device be used which is an adaptation of the picture-board approach devised by McCandless and Marshall (1957). Although there is considerable question concerning the merit of sociometric techniques with preschool children, concern for more information about early childhood peer interaction and social-

ization behavior favors its inclusion. In a recent review, Moore (1967) has testified to the validity and reliability of obtaining sociometric choices with nursery school children utilizing photographs. Although there appears to be only moderate stability in the preschool child's peer choice (3-week test--reproducibility coefficients of approximately .5), identification of "star" and "isolates" such as concommitant child characteristics and teacher-pupil interaction behaviors; e.g., does a class learn to prefer the child who receives the most attention from the teacher and/or exhibits the behaviors valued by that teacher?

Boger, R. P. The play situation-picture board sociometric technique. Michigan State Head Start Evaluation & Research Center, 1968.

Marshall, H. R. An evaluation of sociometric-social behavior research with preschool children. Child Development, 1957, 28, 131-138

Marshall, H. R., & McCandless, B. R., A study in prediction of social behavior of preschool children. Child Development, 1957, 28, 149-159.

McCandless, B. R., & Marshall, H. R. A picture-sociometric technique for preschool children and its relation to teacher judgments of friendship. Child Development, 1957, 28, 139-149.

Moore, S. G. Correlates of peer acceptance in nursery school children. Young Children, 1967, 22, (5), 281-297.

Moore, S. & Updegraft, R. Sociometric status of preschool children related to age, sex, nurturance-giving and dependency. Child Development, 1964, 35, 519-524.

Name of Measure: Polarity Scale

Variables Measured: Left- versus right-wing ideology

Status	Age-Grade Level						Teacher
	3½	4½	K	Gr.1	Gr.2	Gr.3	
Ready to Go							X
In Development							

Data Collection Method: _X_ Group Test ____ Interview ____ Individual Test ____ Observation

Estimated Administration Time (min.): 10-20 minutes

Brief Statement of Procedure: This questionnaire presents a series of pairs of statements, each pair reflecting left- versus right-wing ideology. The subject marks each pair to reflect agreement with both statements, agreement with only the left-wing statement, agreement with only the "right-wing" statement, or agreement with neither statement.

Minimum Requirements for the Administrator-Observer:

Supporting Statement: The Polarity Scale (1964) is a measure of left- versus right-wing ideology. Tomkins (1962; 1963), has presented a rich description of the implications of this broad dimension. Among the major polarities conceived as falling under the left-right polarity are the following: (1) man is an end in himself versus man is of value to the extent that he adheres to some external value; (2) values are what man wishes versus values exist independent of man; (3) man should satisfy and maximize his affects and drives versus man should be governed by norms which in turn modulate his drives and affects; (4) power should be maximized in order to maximize positive affects and to minimize negative affects versus power should be maximized to maximize norm compliance and achievement; (5) weakness should be tolerated and ameliorated versus weakness should be punished. That polarities such as the above have profound implications for educational practice is manifestly clear. It is precisely because of these implications that this information should be obtained on the teachers of the disadvantaged.

Tomkins, S. S. Affect, imagery, and consciousness. New York: Springer, 1962.

Tomkins, S. S. Left and right; A basic dimension of ideology and personality. In R. W. White (Ed.), The study of lives. New York: Atherton Press, 1963, pp. 388-411.

Tomkins, S. S. Polarity Scale. New York: Springer, 1964.

Name of Measure: Portable Rod-and-Frame Test

Variables Measured: Analytical functioning (field dependence-independence)

Status	Age-Grade Level					
	3½	4½	K	Gr.1	Gr.2	Gr.3
Ready to Go						
In Development			X	X	X	X

Data Collection Method: ___ Group Test ___ Interview
_X_ Individual Test ___ Observation

Estimated Administration Time (min.): 15-30 minutes

Brief Statement of Procedure: S must set a rod to the true vertical in the presence of the conflicting cues of a tilted visual field.

Minimum Requirements for the Administrator-Observer: Ability to relate with the children and follow specified standard procedures. No special education required.

Supporting Statement: There is a 20 year history of research spelling out some of the broad cognitive and personal-social implications of performance on the rod-and-frame test (Witkin & Asch, 1948; Witkin, et al 1954, 1962, 1966). This and related research has shown the rod-and-frame test (RFT) to be an excellent measure of field-dependence-independence and of a more broadly conceptualized construct, analytical versus global functioning.

The chief disadvantages of the regular rod-and-frame apparatus are its size and the fact that it must be administered in a light-proof, totally darkened room. A prototype model of a portable rod-and-frame apparatus has been developed by one of Witkin's associates, Dr. P. K. Oltman (see Witkin, 1967 for a description of this apparatus). It can be administered in a normally lighted room and has been shown to yield reliable scores that are highly related to scores on the large standard RFT. The test has been successfully administered to 6-year-olds and will soon be available from Polymetric Company.

Witkin, H. A. A cognitive-style approach to cross-cultural research. International Journal of Psychology, 1967, 2, 233-250.

Witkin, H. A. & Asch, S. E. Studies in space orientation - IV - Further experiments on perception of the upright with displaced visual fields. Journal of Experimental Psychology, 1948, 38, 762-782.

Witkin, H. A., Dyk, R. B., Faterson, H. F., Goodenough, D. R., & Karp, S. A. Psychological differentiation. New York: Wiley, 1962.

Witkin, H. A., Faterson, H. F., Goodenough, D. R., & Birnbaum, J. Cognitive patterning in mildly retarded boys. Child Development, 1966, 37, 301-316.

Witkin, H. A., Lewis, H. B., Hertzman, M., Machover, K., Meissner, P. B., & Wapner, S. Personality through perception. New York: Harpers, 1954.

Name of Measure: Preschool Embedded Figures Test

Variables Measured: Analytical functioning (field dependence-independence)

Status	Age-Grade Level					
	3½	4½	K	Gr.1	Gr.2	Gr.3
Ready to Go						
In Development	X	X	X			

Data Collection Method: ___ Group Test ___ Interview
X Individual Test ___ Observation

Estimated Administration Time (min.): 15 minutes

Brief Statement of Procedure: S is shown a simple geometric figure and must then find it in an embedding context.

Minimum Requirements for the Administrator-Observer: Ability to relate with the children and follow specified standard procedures. No special education required.

Supporting Statement: See Supporting Statement for Children's Embedded Figures Test

Name of Measure: Principal Behavior Description Questionnaire

Variables Measured: Principal performance ratings

Status	Age-Grade Level						Teachers
	3½	4½	K	Gr.1	Gr.2	Gr.3	
Ready to Go							X
In Development							

Data Collection Method: X Group Test ___ Interview

___ Individual Test ___ Observation

Estimated Administration Time (min.): 5-10 minutes

Brief Statement of Procedure: Completion of the questionnaire requires the teachers to describe the behavior of the principal. It does not ask them to judge whether this behavior is desirable or undesirable. Administered in booklet form.

Minimum Requirements for the Administrator-Observer: Self-administered

Supporting Statement: In order to more fully understand the behavior within a school, one needs to be cognizant of many factors in addition to a description of what occurs in the classroom. The instrument is devised to reflect the teachers perceptions of the principal on two dimensions: Consideration and Initiating Structure. These factors will be examined in relation to the "feeling" or "tone" of the school.

Hemphill, J. K., Griffiths, D. E. & Frederiksen, N. Administrative performance and personality. New York: Bureau of Publications, Teachers College, Columbia University, 1962.

Name of Measure: Principal's "Job Description" Inventory

Variables Measured: Principal descriptions

Status	Age-Grade Level						Principal
	3½	4½	K	Gr.1	Gr.2	Gr.3	
Ready to Go							X
In Development							

Data Collection Method: ___ Group Test ___ Interview

_X_ Individual Test ___ Observation

Estimated Administration Time (min.): 15-30 minutes

Brief Statement of Procedure: The instrument consists of (1) a rating of principal job activities as to frequency of occurence and, (2) a ranking of the same activities as to importance. Administered in booklet form.

Minimum Requirements for the Administrator-Observer: Self-administered

Supporting Statement: This instrument has a dual purpose--it provides a method by which the principal can describe or catalog the various types of activities that are his everyday concern and responsibility and it also allows him to indicate those activities which should reflect the most important aspects of his job as principal. This will permit investigation of the differences between principals on the basis of their activities and concerns, possibly relating these to the general "tone" or "feeling" of their schools.

Campbell, R. & Gregg, R. T. Administrative behavior in education. New York: Harper & Brothers, 1957.

Hemphill, J. K., Griffiths, D. E., & Frederiksen, N. Administrative performance and personality. New York: Bureau of Publications, Teachers College, Columbia University, 1962.

Ramseyer, J. A., Pond, M. Z., Wakefield, H., & Harris, L. E. Factors affecting educational administration. Columbus, Ohio: The Ohio State University, 1955.

Wahlquist, J. T., Arnold, W. E., Campbell, R. F., & Sands, L. B. The administration of public education. New York: Ronald Press Company, 1952.

Name of Measure: PROSE

Variables Measured: See Chapter G

Status	Age-Grade Level					
	3½	4½	K	Gr.1	Gr.2	Gr.3
Ready to Go		X	X	X	X	X
In Development						

Data Collection Method: ____ Group Test ____ Interview
____ Individual Test X Observation

Estimated Administration Time (min.):

Brief Statement of Procedure: See Chapter G., Observation Strategies

Minimum Requirements for the Administrator-Observer: Observers will be specifically trained for this task by ETS personnel.

Supporting Statement: See Chapter G., Observation Strategies

Name of Measure: Relevant Redundant Cue Concept Task

Variables Measured: Concept acquisition, learning ability and attention

Status	Age-Grade Level					
	3½	4½	K	Gr.1	Gr.2	Gr.3
Ready to Go		X	X	X	X	X
In Development						

Data Collection Method: ____ Group Test ____ Interview
X Individual Test ____ Observation

Estimated Administration Time (min.): 15-20 minutes

Brief Statement of Procedure: S is shown cards one at a time, each card has some kind of form on it (for youngest groups it may be necessary to use concrete objects). S is told that some cards are "X's" and some are "Y's" and requested to guess whether each card is an"X" or a "Y". Feedback follows, then another card is shown. This is continued until criterion is reached. Transfer tasks can be carried out in several ways: S may be asked to verbalize the criterial dimension; a deck of cards may be used which have only one or two dimensions on them with S requested to sort the cards into the two categories (his success and pattern of sorting also reflects attentional processes).

Minimum Requirements for the Administrator-Observer:

Supporting Statement: A concept acquisition task of the type usually utilized in psychological studies provides a good vehicle for studying inductive reasoning. Analysis of concept acquisition can yield information about learning rates and strategies employed. The strategies employed in concept acquisition seem particularly important in the study of children over an age period where these strategies change (Weir, 1964).

Some experimenters (Zeaman & House, 1963; Trabasso & Bower, 1968) have suggested that the process of attention plays a central role in concept acquisition. A number of experimenters have been concerned with the development of attention (Maccoby & Konrad, 1967; Hagen, 1967; Siegel & Stevenson, 1966) in relation to its deployment for selecting information, but there has been little effort to explore the role of attention deployment learning tasks such as concept formation.

The relevant redundant cue or RRC paradigm of concept formation study permits some examination of the deployment of attention. In this type of a task, two or more dimensions are redundant and, therefore, any of them may serve as the basis for learning the concept. (Whether or not such a redundant cue is termed relevant or irrelevant seems to be solely a matter of experimenter preference.) By employing transfer tasks after criterion has been reached, one can determine which and how many of the dimensions the subject has attended to. (Attention here refers to attention-for-the-purpose-of-learning. Attention in the sense of noticing the dimensions is quite different).

Hagen, J. The effect of distraction on selective attention. Child Development, 1967, 38, 685-694.

Maccoby, E. E., & Konrad, V. W. Effect of preparatory set on selective listening: Developmental trends. Monograph of the Society for Research in Child Development, 1967, 32, (4, Whole No. 112).

Siegel, A., & Stevenson, H. W. Incidental learning: A developmental study. Child Development, 1966, 37, 811-817.

Trabasso, T., & Bower, G. Attention in Learning. New York: Wiley, 1968.

Weir, M. Developmental changes in problem solving strategies. Psychological Review, 1964, 71, 473-490.

Zeaman, D., & House, B. J. The role of attention in retardate discrimination learning. In N. R. Ellis (Ed.), Handbook of mental deficiency. New York: McGraw-Hill, 1963.

Name of Measure: Relevant Redundant Cue Concept Task, Second Administration

Variables Measured: Learning set

Status	Age-Grade Level					
	$3\frac{1}{2}$	$4\frac{1}{2}$	K	Gr.1	Gr.2	Gr.3
Ready to Go		X	X	X	X	X
In Development						

Data Collection Method: ___ Group Test ___ Interview

_X_ Individual Test ___ Observation

Estimated Administration Time (min.): 10-15 minutes

Brief Statement of Procedure: Same as Relevant Redundant Cue Concept Task

Minimum Requirements for the Administrator-Observer:

Supporting Statement: Like the typical concept acquisition task, a learning set task involves inductive thinking. Unlike the usual design, however, learning set tasks change in such a way that the experimenter can discover the extent to which the learning is specific to the materials in the initial task. This is a critical aspect of concept acquisition with young children where the degree of generalization is often negligible or nonexistent. It is proposed that after the initial results have been obtained on the RRC concept acquisition task, a second version be administered. The relearning scores thus obtained would yield the transfer information being sought without giving up the attention data which the RRC task provides. The relearning data would provide information on the degree to which the "set" has been acquired or, in Achenbach and Zigler's terminology, the degree to which the child is learning a problem and not a cue.

Name of Measure: Risk-Taking Tasks

Variables Measured: Risk taking

Status	Age-Grade Level					
	3½	4½	K	Gr.1	Gr.2	Gr.3
Ready to Go				x	x	x
In Development	x	x	x			

Data Collection Method:

____ Group Test

____ Interview

__x__ Individual Test

____ Observation

Estimated Administration Time (min.): 30 minutes

Brief Statement of Procedure: The first task will be a single binary choice situation with a 70-30 outcome. The second task will offer a choice between two outcomes; one easy to obtain but with low payoff; the other difficult to obtain but with high payoff.

Minimum Requirements for the Administrator-Observer: Same as for other testers

Supporting Statement: This variable should be related to locus of control (I-E) variables and as such may be a good measure of feelings of competence.

The locus of reinforcement or control data has been shown to be related to school performance and achievement behavior in general. However, no I-E scale is available for younger children so that it is necessary to obtain some measure believed related to this variable. Such a relationship might be found between risk-taking and I-E. To test this, risk-taking tasks will be given to subjects who are old enough also to receive standard I-E scales. If there is a relationship between variables, then risk-taking tasks can be given to subjects too young for the I-E scales. The risk-taking task has to be simple and non-verbal for these younger subjects.

Crandall, V. C. Achievement behavior in young children. Young Children, 1964, 20, 77-90.

Crandall, V. C., Katkovsky, W., & Crandall, V. J. Children's beliefs in their own control of reinforcements in intellectual-academic situations. Child Development, 1965, 36, 91-109.

Lefcourt, H. M. Internal versus external control of reinforcement: A review. Psychological Bulletin, 1966, 65, 206-220.

Lefcourt, H. M., Lewis, L., & Silverman, I. W. Internal versus external control of reinforcement and attention in a decision making task. Journal of Personality, in press.

Lewis, M., & Goldberg, S. Perceptual and cognitive development in infancy: A generalized expectancy model as a function of the mother-infant interaction. Merrill-Palmer Quarterly, in press.

Rotter, J. B. Generalized expectancies for internal versus external control of reinforcement. Psychological Monographs, 1966, 30.

Weir, M. W. Developmental changes in problem-solving strategies. Psychological Review, 1964, 71, 473-490.

Weir, M. W. Children's behavior in probabilistic tasks. In W. W. Hartup & N. L. Smothergill (Eds.) The young child: Reviews of research, National Association for the Education of Young Children, Washington, D.C, 1967.

Name of Measure: Ryans/ORF Scales: ETS Modified

Variables Measured: Classroom atmosphere, including social emotional climate created by teacher, and cognitive-perceptual stimulation

Status	Age-Grade Level					
	3½	4½	K	Gr.1	Gr.2	Gr.3
Ready to Go						
In Development		X	X	X	X	X

Data Collection Method: ___ Group Test ___ Interview ___ Individual Test X Observation

Estimated Administration Time (min.): 15-20 minutes per classroom (This represents the time needed to make the ratings. Actual observation time is at least 5 hours.)
Brief Statement of Procedure: After completing the personal-social ratings of all children in a classroom, raters are asked to rate the teacher on a set of scales.

Minimum Requirements for the Administrator-Observer: Mothers with as much education as possible. A training period is required. These raters can be trained at the same time to make the child ratings.

Supporting Statement: In addition to assessing specific teacher-child interactions by means of Medley's PROSE instrument, it is believed that appraisals of classroom social-emotional climate and cognitive-perceptual stimulation by trained raters can add significantly to the study. These ratings will be made by the same person who rates the children's personal-social characteristics in the classroom. (Because successful application of the PROSE procedure requires the observer to maintain a less inferential set than required for judging classroom climates, it is recommended that PROSE observers not be asked to make these ratings on atmosphere.)

Research has established that such ratings generate reliable data, and that such information is related both to child behavior in the classroom and to other teacher characteristics (Pierce-Jones, Caldwell & Linn, 1966; Ryans, 1960).

Such ratings can serve the following aims: (1) Their relations to PROSE variables can be determined, thereby linking more detailed analyses of teacher-child and child-child interactions to more general dimensions of classroom climate.

(2) Classroom ratings can be related to certain teacher, school, and community characteristics. (3) The impact of classroom climate upon the child's personal-social and cognitive growth can be evaluated. (4) The "goodness of fit" between the child's home atmosphere and classroom atmosphere may be an important determinant of the child's educational growth, especially at young ages; e.g., a child from a home that is more restrictive and punitive than his first teacher may initially behave more disruptively in the classroom than children whose home-classroom atmosphere matches are different.

A set of scales will be used to judge the affective and cognitive perceptual climates of the classroom Certain scales will be similar to those that have been found to be useful in characterizing parental attitudes (e.g., Schaefer, 1961). The raters will be the same persons who rate the children. This procedure will create a minimum of about four hours of teacher observation time upon which each teacher rating could be based. Since there is evidence that the same teacher will vary in the climate he or she creates over time (Medley & Mitzell, 1963), repeated appraisals of the same teacher will be made. It is hoped that such a procedure can lead to a "teacher consistency" score, which, in turn can be related to other variables in the study.

Medley, D. M., & Mitzel, H. E. Measuring classroom behavior by systematic observations. In N. L. Gage (Ed.), Handbook of research on teaching. Chicago, Ill.: Rand McNally, 1963, 247-328.

Pierce-Jones, J., Caldwell, B. S., Y Linn, E. L. The observer's rating form. The Child Development Research and Evaluation Center (Southwest) University of Texas, 1966.

Ryans, D. G. Characteristics of teachers. Washington: American Council on Education, 1960.

Schaefer, E. S. Converging conceptual models for maternal behavior and for child behavior. In J. C. Glidewell (Ed.) Parental attitudes and child behavior. Springfield, Ill.: Thomas, 1961, 124-146.

Name of Measure: School Information Questionnaire

Variables Measured: Physical facilities; school personnel; student information; pupil services; special equipment; extra-curricular activities; school expenditures; school-community relations; teacher descriptions of students, teachers, and principals; principal characteristics; principal descriptions of students and teachers

Status	Age-Grade Level						Principal
	3½	4½	K	Gr.1	Gr.2	Gr.3	
Ready to Go							X
In Development							

Data Collection Method: ___ Group Test ___ Interview
X Individual Test ___ Observation

Estimated Administration Time (min.): 1-5 hours

Brief Statement of Procedure: This questionnaire is to be completed by the principal. However, to relieve the principal of searching records, much responsibility for completion can be delegated by the principal to other administrative staff members.

Minimum Requirements for the Administrator-Observer: Self-administered

Supporting Statement: The major purpose of this instrument is to describe the sample of schools. This process will allow identification and documentation of the differences that exist among the study schools. Particular emphasis will be placed on differences between preschools and elementary schools and on differences among schools by geographic area. The study also affords the opportunity to relate school characteristics to educational process variables and to a wide variety of pupil variables--including the relationship of school characteristics to student performance.

Coleman, J. S., Campbell, E. Q., Hobson, C. J., McPartland, J., Mood, A. M., Weinfeld, F. D., York, R. L. Equality of educational opportunity. (Final report to the U.S. Office of Education, OE-38001) Washington, D.C.: U.S. Government Printing Office, 1966.

Flanagan, J. C., Dailey, J. T., Shaycoft, M. F., Orr, D. B., Goldberg, I. Project talent - studies of the American high school. (Final report to the U.S. Office of Education, Cooperative Research Project No. 226.) Washington, D.C.: Project TALENT Office, University of Pittsburgh, 1962.

Hemphill, J. K., Richards, J. M. & Peterson R. E. Report of the senior high-school principalship. Washington, D.C.: The National Association of Secondary School Principals, 1965.

Rock, D. A. & Hemphill, J. K. Report of the junior high-school principalship. Washington, D.C.: The National Association of Secondary School Principals, 1966.

Shaycoft, M. F. Project talent - the high school years: growth in cognitive skills. (Interim report to the U.S. Office of Education, Cooperative Research Project No. 3051.) Pittsburgh: Project TALENT Office, University of Pittsburgh, 1967.

Name of Measure: Seguin Form Board

Variables Measured: Form discrimination--eye-hand motor coordination

Status	Age-Grade Level					
	3½	4½	K	Gr.1	Gr.2	Gr.3
Ready to Go	X	X	X			
In Development						

Data Collection Method: ____ Group Test ____ Interview
X Individual Test ____ Observation

Estimated Administration Time (min.): Maximum of 5 minutes

Brief Statement of Procedure: Form board and blocks placed in front of S. Instructions: "Let us see how quickly you can put the blocks in place."

Minimum Requirements for the Administrator-Observer: No special requirements.

Supporting Statement: Eye-hand motor coordination is a precursor skill for writing.

Standardization (Pinter Paterson, 1917):
N = 1,537 (Unselected group of ordinary school children, excluding exceptionally dull and nervous children)
Norms for 5 - 14 available

Arthur, G. A point scale of performance tests. New York: The Commonwealth Fund, 1943.

Pinter, R. & Paterson, D.G. A scale of performance tests. New York: Appleton, 1917.

Stutsman, R. Guide for administering the Merrill-Palmer Scales of Mental Tests. Yonkers-on-Hudson: World Book Company, 1931.

Name of Measure: Service Worker Interview

Variables Measured: Attitudes toward and perceptions of cummunity areas and residents held by service workers and community leaders

Status	Age-Grade Level						
	3½	4½	K	Gr.1	Gr.2	Gr.3	Adult
Ready to Go							
In Development							x

Data Collection Method: ___ Group Test ___x___ Interview
___ Individual Test ___ Observation

Estimated Administration Time (min.): 60 minutes

Brief Statement of Procedure: Interview

Minimum Requirements for the Administrator-Observer: Ability to read and understand questions, record answers.

Supporting Statement: See chapter in text: J. The Impact of the Community, page J-16.

Name of Measure: Sigel Conceptual Style Sorting Task

Variables Measured: Cognitive style in relating stimuli--descriptive (analytic or global), relational-contextual, and categorical-inferential orientations. Verbal ability--giving reasons that coherently explain or describe a chosen relationship. Cross reference: Reflectivity-impulsivity.

Status	Age-Grade Level					
	3½	4½	K	Gr.1	Gr.2	Gr.3
Ready to Go	X	X	X	X	X	X
In Development						

Data Collection Method: ____ Group Test ____ Interview

__X__ Individual Test ____ Observation

Estimated Administration Time (min.): 25-30 minutes

Brief Statement of Procedure: The task materials consist of 12 familiar objects that may be related in various ways. A different object is selected by E on each of 12 trials, and S is asked to select things that "go with it." After each trial, S is asked why the objects he has chosen go together. Latency time for the child's initial response on each trial will be recorded. Style coding is possible for both verbal and nonverbal responses.

Minimum Requirements for the Administrator-Observer: Ability to encourage children to give reasons; thorough understanding of the styles tapped by the test in order to record key words (ideas) in the child's explanation if verbatim recording becomes impossible.

Supporting Statement: This task has been used by Sigel and his colleagues with several hundred low-income preschool children and has proven to be an appropriate discriminating measure for 3 year olds.

Name of Measure: **Social Schemata**

Variables Measured: **Interpersonal Racial Attitude**

Status	Age-Grade Level					
	3's	4's	K	Gr.1	Gr.2	Gr.3
Ready to Go		X	X	X	X	X
In Development						

Data Collection Method: ___ Group Test ___ Interview
__X__ Individual Test ___ Observation

Estimated Administration Time (min.): **10-15 minutes**

Brief Statement of Procedure: **(See attached page)**

Minimum Requirements for the Administrator-Observer: **Some experience with young children, a 15 minute training period.**

Supporting Statement: The prevalence of racial awareness and race related attitudes in children as young as three and four years has long been noted (Simpson and Yinger, 1953). Only more recently, however, have the pervasive if complex relationships between interracial attitudes and such educationally relevant factors as self-concept, academic achievement, teacher expectation and locus of control received fuller exploration. (Coleman, Campbell, Hobson, McPartland, Mood, Weinfeld, York, 1966, U. S. Commission on Civil Rights, 1967). The current concern with the education of minority groups in general, and school desegregation in particular, sharpened the need for suitable means of assessing and monitoring interracial attitudes.

The present instrument relies heavily on both the theoretical framework and instrumentation developed by Kuethe (1964) related to social schematization. His interest in the unit forming principles of social perception (as a prerequisite for a model of interpersonal relations) led to the designing of techniques for the uncovering of such organizational principles. By asking subjects to structure social stimuli (representations of people) in a free

response situation, Kuethe (1964a) found high commonality of basic schemata within the general population, such as the tendency to place a child nearer to a woman than a man, to place human figures together and not allow non-human figures to intervene, etc. Additionally, differently characterized subject populations were found to employ different schemata in organizing sets of social stimuli. Subjects high on ethnocentrism were found to segregate black and white human figures in a field, while subjects low on ethnocentrism tended to group all human figures, disregarding color.

The ability to assess children's racial attitudes should prove most useful in the clarification of a host of critical but open questions, such as:

a. the effect of desegregation on children's racial attitudes
b. the effect of a racially homogeneous or mixed teaching staff on racial attitudes
c. the nature of the interrelationship between school integration, academic achievement, and interracial acceptance (the latter may prove to be the mediating variable between integration and its effect on achievement)
d. the influence of racial attitudes on self-concept, and the often postulated effect on motivation
e. the influence of racial attitudes on expectations of the child vis a vis the social setting, as the placement of the locus of control
f. the influence of the children's racial attitudes on the teacher's expectations of both groups of children, the beneficiaries of positive racial attitudes as well as those confronted with negative attitudes

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Cohen, S., Amarel, M., & Ames, N. A distance measure of racial attitudes in primary grade children: An exploratory study. Paper read at the A.P.A. meeting, September, 1968, San Francisco.

Coleman, J. S., Cambell, E. Q., Hobson, C. J., McPartland, J., Mood, A. M., Weinfeld, F. D., & York, R. L. Equality of educational opportunity. (Final report to the U. S. Office of Education, O.E.-38001) Washington, D.C.: U.S. Government Printing Office, 1966.

Kuethe, J. L. Pervasive influence of social schemata. Journal of Abnormal and Social Psychology, 1964, 68, 248-254. a

Kuethe, J. L. Prejudice and aggression: A study of specific social schemata. Perceptual and Motor Skills, 1964, 18, 107-115. b

Simpson, G. E., Yinger, J. Milton. Racial and cultural minorities. New York: Harper & Bros., 1953.

U. S. Commission on Civil Rights. Racial isolation in the public schools, Washington, U. S. Government Printing Office, 1967.

Brief Statement of Procedure: The instrument consists of a booklet containing a number of pages each of which has a figure printed on the left side of it. These "target" figures can include any representable significant figures in the child's environment, as parents, teachers, peers, etc. Along with the booklet the child receives a set of gummed labels on each of which is drawn a child of appropriate age, sex, and race to represent the self. The task is to paste the picture of the self on the page with the target figure.

The tentative list of target figures is as follows:

1.	Geometric Figure (non-social stimulus)	
2.	Mother	
3.	Father	
4.	Teacher	White
5.	"	Medium
6.	"	Dark
7.	Boy	White
8.	"	Medium
9.	"	Dark
10.	Girl	White
11.	"	Medium
12.	"	Dark
13.	Self	
14.	Home	
15.	School	

The simple linear distance between the figures and also the position of the self figure relative to the vertical axis of the page form the basic data yielded by the instrument.

The child is shown a display of three sex and age relevant self-figures, varying in color from white through medium dark to dark. The child is asked to choose the figure that "looks most like you." This representation will consequently be used on the self-figure throughout. A booklet in which the parent figures and the target self-figure are matched in shade with the chosen self figure is put in front of the child. The experimenter asks the child to take one of the self-figures. Sample instruction is as follows: "Here is a picture of yourself. Here is a picture of a mother. Put yourself on the page with the mother. Put yourself any place you want on the page."

Name of Measure: Spontaneous Correspondence

Variables Measured: Conception of number

Status	Age-Grade Level					
	3½	4½	K	Gr.1	Gr.2	Gr.3
Ready to Go		X	X			
In Development	X					

Data Collection Method: ____ Group Test ____ Interview

X Individual Test ____ Observation

Estimated Administration Time (min.): 5-10 minutes

Brief Statement of Procedure: A set of objects is arranged by the experimenter and S is asked to make an equivalent, matching set. S's version of equivalence is recorded.

Minimum Requirements for the Administrator-Observer: Training in administering similar tasks to young children.

Supporting Statement: In Piaget's research (Piaget, 1952; Piaget & Inhelder, 1956) the problems of correspondence involve the comparison of two sets of objects as a particular way of establishing equivalence between the sets. Correspondence may be "provoked"; e.g., one egg for each egg cup, or may be "spontaneous" in which case objects are homogeneous; e.g., selecting six marbles to match the six selected by E. In either case, correspondence is considered to be a primitive precursor of concepts of conservation, and number concepts generally. In almost every published version of a conservation task, correspondence items are included as a way of "establishing identity" of the stimulus materials. Rarely, however, is the subject's performance on these "preliminary" tasks studied in its own right. The proposed task is being developed to look at the early efforts to establish equivalence through the comparison of various arrays which are identical, associated, or sequential.

Piaget, J. The child's conception of number. New York: Humanities, 1952.

Piaget, J., & Inhelder, B. The child's conception of space. London: Routledge & Kegan Paul, 1956.

Name of Measure: Stanford Memory Test

Variables Measured: Memory: short term, long term

Status	Age-Grade Level					
	3½	4½	K	Gr.1	Gr.2	Gr.3
Ready to Go		x	x	x	x	x
In Development	x					

Data Collection Method: ___ Group Test ___ Interview

x Individual Test ___ Observation

Estimated Administration Time (min.): 10 minutes

Brief Statement of Procedure: The Stanford Memory Test is a series of line drawings of children. Each drawing appears twice. On the first presentation, E names the picture; on the second presentation, the name is requested from S. The interval between presentation and test varies for different items, yielding a short term retention curve. Approximately ½ hour after the end of the short term series, S is shown an array of all pictures, given a name and requested to find the matching picture. This yields a long term retention function.

Minimum Requirements for the Administrator-Observer: Administrator must be trained to avoid given cues or assisting child; e.g., by unconsciously repeating name. Must be able to pace presentation of stimulus materials.

Supporting Statement: Memory is among the most basic of processes. Memory for a paired associate seems to be of particular importance in early childhood as this is part of the process that Brown (1958) has called the original word game. Most research to date has been limited to either systematic studies of very short term memory such as digit span as given in the Stanford-Binet or WISC, or unsystematic studies of slightly longer term memory (Atkinson, Bernbach, & Hansen, 1964; Hagen, 1967). Nowhere are retention curves plotted for short term forgetting or is a test made of long term retention. Such curves are derived and such tests are made in the Stanford Memory Test.

In addition to the basic quality of memory, there is the fact that results of memory tests when taken with results from standard IQ tests have been used for some controversial assertions (Jensen, 1968) concerning the disadvantaged. These assertions do not appear to be on very solid ground, and it is imperative to have further information on the subject.

Atkinson, R. Bernbach, H., and Hansen, D. Short-term memory with young children. Psychonomic Science, 1964, 1, 255-256.

Brown, R. Words and Things. New York: Free Press, 1958.

Hagen, J. The effect of distraction on selective attention. Child Development, 1967, 38, 685-694.

Jensen, A. Paper read at AERA Convention, Chicago, February, 1968.

Name of Measure: Stroop Color-Word Interference Task

Variables Measured: Constricted vs. flexible control (resistance to distraction or interference)

Status	Age-Grade Level					
	$3\frac{1}{2}$	$4\frac{1}{2}$	K	Gr.1	Gr.2	Gr.3
Ready to Go						
In Development					x	x

Data Collection Method: ____ Group Test ____ Interview

x Individual Test ____ Observation

Estimated Administration Time (min.): 5-6 minutes

Brief Statement of Procedure: S must first read a series of color names, then name series of color patches, then give name of color in which color names are printed.

Minimum Requirements for the Administrator-Observer: Ability to relate to child, time accurately. Follow standard procedure. Little education required.

Supporting Statement: (See supporting statement for Fruit-Distraction Type Test)

Gardner, R. W., Holzman, P. S., Klein, G. S., Linton, H. B., & Spence, D. Cognitive control: A study of individual consistencies in cognitive behavior. Psychological Issues, 1959, 1, Monograph 4.

Jensen, A. R., & Rohwer, W. D., Jr. The Stroop Color-Word Test: A review. Acta Psychologica, 1966, 25, 36-93.

Klein, G. S. Need and regulation. In M. R. Jones (Ed.), Nebraska symposium on motivation. Lincoln: University of Nebraska Press, 1954, pp. 224-274.

Stroop, J. R. Studies of interference in serial verbal reactions. Journal of Experimental Psychology, 1935, 18, 643-662.

Name of Measure: Supplementary Computation Exercises

Variables Measured: Arithmetic computation skills

Status	Age-Grade Level					
	$3\frac{1}{2}$	$4\frac{1}{2}$	K	Gr.1	Gr.2	Gr.3
Ready to Go						
In Development					X	X

Data Collection Method: _X_ Group Test ____ Interview

____ Individual Test ____ Observation

Estimated Administration Time (min.): 10 minutes

Brief Statement of Procedure: S will be required to perform appropriate, routine, mechanical operations of addition, subtraction, and possibly simple multiplication. Test format will be multiple-choice (probably three choices). S will be required to mark single correct choice.

Minimum Requirements for the Administrator-Observer: Ability to administer the tests according to detailed instructions in the manual. Administrator should be familiar to Ss and have the kind of voice they are used to listening to in school.

Supporting Statement: To obtain a measure of computation skills to supplement measure of understanding of concepts obtained from the Cooperative Primary Mathematics Test.

Name of Measure: Synthesis of Visually Perceived Forms (Birch & Lefford)

Variables Measured: Form synthesis, perceptual integration

Status	Age-Grade Level					
	3½	4½	K	Gr.1	Gr.2	Gr.3
Ready to Go			X	X	X	X
In Development						

Data Collection Method:

___ Group Test

___ Interview

X Individual Test

___ Observation

Estimated Administration Time (min.): 10 minutes

Brief Statement of Procedure: Each test problem appears on 6" X 8" cards. On left is test figure, on right, four sets of lines varying in length and spatial orientation. S asked to pick out "bundle" of lines which could be used to make test figure.

Minimum Requirements for the Administrator-Observer: No special requirements.

Supporting Statement: The measure is included for its ability to distinguish brain damaged from normal children and as a diagnostic instrument in analyzing failures in reading and writing. See Birch and Lefford (1964, 1967) and Farnham-Diggory (1967).

Performance at diff. ages in the visual synthesis of form:

Age	Mean	SD	N
5	2.1	1.8	23
6	4.0	1.5	25
7	3.4	1.5	28
8	4.4	1.4	20
9	4.6	1.4	17
10	5.1	1.0	14

Max. = 6

Diff. between normal and cerebral-palsied children in synthesis task:

Age	Normal	C-P
5	1.3	1.0
6	2.5	0.8
7	1.9	0.9
8	2.5	0.3
9	2.1	0.8
10	2.9	0.8

Max. = 3

Birch, H. G., & Lefford, A. Visual differentiation, intersensory integration, and voluntary motor control. Monographs of the Society for Research in Child Development, 1967, 32, 2, serial no. 110.

Birch, H. G., & Lefford, A. Two strategies for studying perception in "brain-damaged" children. In Brain Damage in Children, H. Birch (Ed.), Baltimore: Williams and Wilkens, 1964.

Farnham-Diggory, S. Symbol and synthesis in experimental "reading." Child Development, 1967, 38, 1.

Name of Measure: TAMA General Knowledge

Variables Measured: General knowledge

Status	Age-Grade Level					
	3½	4½	K	Gr.1	Gr.2	Gr.3
Ready to Go						
In Development	x	x	x	x	x	x

Data Collection Method: K-3 Group Test ____ Interview

3½, 4½ Individual Test ____ Observation

Estimated Administration Time (min.): 10 minutes (3½-4½), 20 minutes (K-3)

Brief Statement of Procedure: Multiple-choice, picture response--3 choices; see Tables C.8 content coverage, number of items, and provision for overlap between successive test levels. Stimulus presented orally; response (3½, 4½) point to correct picture; response (K-3) mark correct picture. No verbal response required.

Minimum Requirements for the Administrator-Observer: Follow standard multiple-choise test administration procedures.

Supporting Statement: A rationale for inclusion of general knowledge measures in the study is provided on pp. C42-C45. That discussion touches upon general knowledge in definitions of "intelligence," as important to functioning in society, as essential to communication, as a base for acquiring other knowledge, and in appraisal of school achievement.

Name of Measure: TAMA Language Completion Test, Exercise A

Variables Measured: Writing: application of knowledge of sentence properties

Status	Age-Grade Level					
	$3\frac{1}{2}$	$4\frac{1}{2}$	K	Gr.1	Gr.2	Gr.3
Ready to Go						
In Development					X	X

Data Collection Method: _X_ Group Test ____ Interview

____ Individual Test ____ Observation

Estimated Administration Time (min.): 10 minutes

Brief Statement of Procedure: S will be required to supply, by writing, the missing word or words to complete a sentence according to accepted syntactical rules. Stimulus will be presented visually and orally, by E, to minimize confounding with reading ability. S should be given whatever additional help is necessary in the mechanics of reading the stimulus material.

Minimum Requirements for the Administrator-Observer: Ability to administer the tests according to detailed instructions in the manual. Administrator should be familiar to Ss and have the kind of voice they are used to listening to in school.

Supporting Statement: To measure S's ability to apply his knowledge of sentence properties; e.g., noun-verb agreement, adjective-adverb confusions.

Name of Measure: TAMA Language Completion Test, Exercise B

Variables Measured: Writing: comprehension and interpretation through structured writing

Status	Age-Grade Level					
	3½	4½	K	Gr.1	Gr.2	Gr.3
Ready to Go						
In Development					X	X

Data Collection Method: _X_ Group Test ____ Interview ____ Individual Test ____ Observation

Estimated Administration Time (min.): 10 minutes

Brief Statement of Procedure: S will be required to supply missing words, phrases, or complete sentences appropriate to the meaning of a structured stimulus. Stimulus will be presented visually and orally, by E, to minimize confounding with reading ability. S should be given whatever additional help is necessary in the mechanics of reading the stimulus material.

Minimum Requirements for the Administrator-Observer: Ability to administer the tests according to detailed instructions in the manual. Administrator should be familiar to Ss and have the kind of voice they are used to listening to in school.

Supporting Statement: To demonstrate comprehension and interpretation of written materials by supplying, in writing, the missing elements in a structured writing situation. This ability is considered to be a precursor of free writing in which the child must create his own structure.

Name of Measure: TAMA Sentence Dictation Test

Variables Measured: Writing: letter making, word making, application of knowledge of word properties (including spelling)

Status	Age-Grade Level					
	3½	4½	K	Gr.1	Gr.2	Gr.3
Ready to Go						
In Development					X	X

Data Collection Method: _X_ Group Test ____ Interview ____ Individual Test ____ Observation

Estimated Administration Time (min.): 10 minutes

Brief Statement of Procedure: S will be required to produce a number of standard types of sentences from dictation. The sentences will contain appropriate capitalization and punctuation; e.g., proper names, Mr., questions, quotations.

Minimum Requirements for the Administrator-Observer: Ability to administer the tests according to detailed instructions in the manual. Administrator should be familiar to Ss and have the kind of voice they are used to listening to in school.

Supporting Statement: To demonstrate ability to write letters and words in acceptable form, to spell, and to observe common practices of capitalization and punctuation.

Name of Measure: TAMA Tell-a-Story Task

Variables Measured: Speaking: Application of knowledge of word and sentence properties, creative speech

Status	Age-Grade Level					
	3½	4½	K	Gr.1	Gr.2	Gr.3
Ready to Go						
In Development	X	X	X	X	X	X

Data Collection Method: ___ Group Test ___ Interview
X Individual Test ___ Observation

Estimated Administration Time (min.): 5-10 minutes

Brief Statement of Procedure: Two 8½" X 11" pictures (in color), one of a city street scene and one of a rural farm scene. Each picture to be structured with similar distribution of variables such as sex, ethnic group, action situations, etc. S is shown one picture at a time. He is asked to (1) label as many items as he can and (2) tell a story about the pictured scene All responses are taped.

Minimum Requirements for the Administrator-Observer: Ability to use tape recorder.

Supporting Statement: Many studies of the language of culturally disadvantaged preschool children (Carson & Rabin, 1960; Loban, 1965) have reported that such children have more difficulty with the productive use of language than its receptive use. There is also some indication that lower SES children of both urban (John & Goldstein, 1964) and rural (Stearns, Hodges, & Spicker, 1966) areas have problems with particular word clusters such as action words and words unfamiliar to their environment.

The TAMA Tell-a-Story test proposes to use pictorial stimuli (urban street scene and rural farm scene) which will permit the comparison of the following elements:

1. "Familiar" and "unfamiliar" milieu (urban and rural)
2. Similar "action" situations; e.g., verbs such as sitting, running, climbing, throwing
3. Similar distribution of boys, girls, babies, adults, animals
4. Similar use of color

By building in comparative elements and situations, the child's productive use of language in "familiar" and "unfamiliar" situations can be observed. Although Stern (1966) has used a similar approach with pictures of rural and urban settings, her pictures were apparently not structured to permit the comparisons described above.

Carson, A. S. & Rabin, A. Verbal comprehension and communication in Negro and white children. Journal of Educational Psychology, 1960, 51, 47-51.

John, V. P., & Goldstein, L. The social context of language acquisition. Merrill-Palmer Quarterly. 1964, 10, 265-276.

Loban, W. Language proficiency and school training. In J. E. Krumboltz (Ed.) Learning and the educational process. Chicago: Rand McNally, 1965.

Stearns, K., Hodges, W. & Spicker, H. Interim Report: A diagnostically based language curriculum for psycho-socially deprived preschool children. Presented at a Symposium on early first-language instruction for the culturally different child, A.E.R.A. Conference, Chicago, February, 1966.

Stern, C. Language competencies of young children. Young Children. 1966, 22 (1), 44-50.

Name of Measure: TAMA Write-a-Story

Variables Measured: Writing: letter making; word making; application of knowledge of word properties (including spelling); application of knowledge of sentence properties; creative writing

Status	Age-Grade Level					
	$3\frac{1}{2}$	$4\frac{1}{2}$	K	Gr.1	Gr.2	Gr.3
Ready to Go						
In Development					X	X

Data Collection Method: X Group Test ___ Interview ___ Individual Test ___ Observation

Estimated Administration Time (min.): 20 minutes

Brief Statement of Procedure: E will present stimulus picture to class. S will be asked to write a story about the picture.

Minimum Requirements for the Administrator-Observer:

Supporting Statement: To measure variables specified above in a free-writing situation to supplement measurement obtained in structured situation. In addition, the task requires S to provide his own structure for expressing related thoughts in writing. Finally, responses will be scored for aspects of creativity (such as originality).

Name of Measure: Tanaka Classification Test

Variables Measured: Concept utilization: ability to abstract the common property of a given grouping and to select an item with a similar property that belongs with the group (inclusion) or delete an item that does not belong (exclusion). Ability to recognize groupings that are based on two properties in common (some items only).

Status	Age-Grade Level					
	3½	4½	K	Gr.1	Gr.2	Gr.3
Ready to Go					X	X
In Development						

Data Collection Method: X Group Test ___ Interview ___ Individual Test ___ Observation

Estimated Administration Time (min.): 15-20 minutes

Brief Statement of Procedure: Paper and pencil format with 30 picture items. S marks an "X" on the picture he thinks does or does not belong with a particular group of pictured objects.

Minimum Requirements for the Administrator-Observer: No special requirements.

Supporting Statement: Developed as a criterion measure for a classification instruction study, and described in detail on Masako Tanaka's doctoral dissertation (in preparation as an ETS Research Bulletin).

Name of Measure: Teacher Individuation Test

Variables Measured: Teacher individuation of pupils

Status	Age-Grade Level					
	3½	4½	K	Gr.1	Gr.2	Gr.3
Ready to Go In Development	X	X	X	X	X	X

Data Collection Method: ____ Group Test ____ Interview

_X_ Individual Test ____ Observation

Estimated Administration Time (min.): 60 minutes

Brief Statement of Procedure: A rating procedure to be done by each teacher for each child in the classroom.

Minimum Requirements for the Administrator-Observer: Same as for other teacher characteristics. Hopefully this procedure could be carried out in a face-to-face session with E.

Supporting Statement: Evidence indicates that mothers who perceive their own children as having personalities distinct from other children in the family or school tend to have children who perform better on cognitive tasks than do mothers who do not so "individuate" their children (Shipman, 1967). Extending this finding to the teacher's role, it is hypothesized that teachers who individuate the pupils in their class will enhance the educational growth of their pupils.

Two kinds of measures of teacher individuation are proposed. The first deals with teacher judgments of child personality characteristics, and will be scored from the teacher ratings of children in the study, described elsewhere.

A second kind of measure is more directly related to the teaching role itself. Presumably, the individuating teacher will match individual differences in the child to differential strategies of teaching in the classroom, so as to maximize learning in each pupil. When asked the question, "What might a teacher best do to maximize educational growth in children X, Y, and Z," the more individuating teacher would assign a variety of teaching styles among children, rather than responding to all pupils in the same manner.

It is therefore proposed that a teacher individuation measure be developed for the longitudinal study. One approach would be to provide the teacher with a list of her pupils together with a list of the bipolar characteristics that will be used in the study to judge teaching climates in the classroom. Teachers would indicate which point on each scale might maximize learning in each child. The data would consist of a child x attribute matrix for each teacher, and the variance attributable to the child x attribute interaction for each teacher could serve as the individuation score for that teacher. Individual differences in these scores could then be related to child outcomes as well as to other teacher, school, and community variables.

Shipman, V. C. Annual report, Head Start evaluation and research center, University of Chicago, November 30, 1967.

Name of Measure: Teacher Questionnaire, Form 581-06

Variables Measured: (See attached page)

Status	Age-Grade Level						Teacher
	3½	4½	K	Gr.1	Gr.2	Gr.3	
Ready to Go							
In Development							x

Data Collection Method: ___ Group Test ___ Interview

_x_ Individual Test ___ Observation

Estimated Administration Time (min.): 90 minutes

Brief Statement of Procedure: paper and pencil questionnaire

Minimum Requirements for the Administrator-Observer: self-administered

Supporting Statement: See Chapter H

Variables Measured: Approach to teaching: background of approach; cooperation; goals for effectiveness; negative reinforcement; perception of class; positive reinforcements. Background information and descriptive survey: aids for work; background - personal; commitment; miscellaneous opinions; perception of school-colleagues; perception of teaching; preparation for work with disadvantaged. Perception of disadvantaged: characteristics of disadvantaged; disadvantaged in the classroom; parental influence; reaction to disadvantaged.

Name of Measure: Teacher Questionnaire on Child's Health

Variables Measured: Child's reactions to illness, rating of child's energy level, compensations made in cases of debilitating illness

Status	Age-Grade Level					
	3½	4½	K	Gr.1	Gr.2	Gr.3
Ready to Go						
In Development		X	X	X	X	X

Data Collection Method: ___ Group Test ___ Individual Test ___X___ Interview ___ Observation

Estimated Administration Time (min.): 5 minutes

Brief Statement of Procedure: Will be included as part of overall teacher interview.

Minimum Requirements for the Administrator-Observer:

Supporting Statement:

Name of Measure: Teacher Reaction Form

Variables Measured: Principal performance ratings

Status	Age-Grade Level						Teacher
	3½	4½	K	Gr.1	Gr.2	Gr.3	
Ready to Go							X
In Development							

Data Collection Method: X Group Test ___ Interview

___ Individual Test ___ Observation

Estimated Administration Time (min.): 2-5 minutes

Brief Statement of Procedure: It requires the teachers to indicate the strong and weak points of their principal by stating the "frequency of occurrence" for various activities. This is a paper and pencil test.

Minimum Requirements for the Administrator-Observer: No special requirements

Supporting Statement: Responses on this instrument reflect the teachers reactions to the actions of their principal. It is felt that an awareness of the "psychological state" of the teachers might be quite useful in understanding and predicting student performance. This defining of attitutdes and relationships will aid in determining the "climate" of a study school, and the subsequent effects of this climate on student performance.

Hemphill, John K., Griffiths, Daniel E., & Frederiksen, Norman. Administrative performance and personality. New York: Teachers College, Columbia University, 1962.

Name of Measure: Test Situation Ratings of Children

Variables Measured: 91 Unipolar Attributes and 22 Bipolar Dimensions found in attached document.

Status	Age-Grade Level					
	$3\frac{1}{2}$	$4\frac{1}{2}$	K	Gr.1	Gr.2	Gr.3
Ready to Go In Development	X	X	X	X	X	X

Data Collection Method:

____ Group Test

X Individual Test

____ Interview

____ Observation

Estimated Administration Time (min.): 5-10 minutes per test battery

Brief Statement of Procedure: Sets of ratings of children, selected for certain test batteries. After testing child on a test battery used to assess cognitive and other child variables, tester makes ratings on child that apply to the child's behavior in that test session.

Minimum Requirements for the Administrator-Observer: Same as for testers.

Supporting Statement: See section in written test: D. Children's Personal and Social Development.

Name of Measure: Urinalysis

Variables Measured: Level of glucose, protein, albumin, blood cells, and bacteria

Status	Age-Grade Level					
	3½	4½	K	Gr.1	Gr.2	Gr.3
Ready to Go	X	X	X	X	X	X
In Development						

Data Collection Method:

___ Group Test

X Individual Test

___ Interview

___ Observation

Estimated Administration Time (min.): 3 minutes

Brief Statement of Procedure: Microscopic examination and dip stick

Minimum Requirements for the Administrator-Observer: Laboratory technician, nurse, or aide

Supporting Statement: Service, plus identific ion of gross infections, kidney disorders, indication of diabetes, etc., which may impede school attendance and attention.

Name of Measure: Uses Test

Variables Measured: Creativity (Nonverbal)

Status	Age-Grade Level					
	3½	4½	K	Gr.1	Gr.2	Gr.3
Ready to Go / In Development	X	X	X	X	X	X

Data Collection Method:

___ Group Test
___ Interview
X Individual Test
___ Observation

Estimated Administration Time (min.): 5 minutes

Brief Statement of Procedure: S will be brought into a testing room, given a toy, and told that he is to play with it for a few minutes. He will then be observed for five minutes with recordings made of each instance of a different play behavior and of the time spent in each variety of play, as well as of any spontaneous verbalizations.

Minimum Requirements for the Administrator-Observer: Someone skilled in testing and observing young children. Several hours of specific training will be required.

Supporting Statement: Rationales for the inclusion of ideational fluency measures of creativity have been presented elsewhere in this appendix. The measures proposed all involve counts of the number of ideas the child is able to give verbally in response to a simple problem requirement. Since some of the most severe cognitive problems of young disadvantaged children involve the use of language, and since fluent verbalization in testing situations is difficult to obtain even with advantaged three and four year old children, an attempt to measure the same processes nonverbally that are tapped by these verbal measures is in order.

A measure of the child's ability to name many different uses for a common object is one of the tests included in the creativity battery which Ward (1968) has adapted from the work by Wallach & Kogan (1965), and is included in the present study for children of kindergarten age and older. A nonverbal measure of the ability to think of alternate uses for an object will thus provide some comparability between verbal and nonverbal creativity indicators.

Wallach, M. A., & Kogan, N. Modes of thinking in young children: a study of the creativity-intelligence distinction. New York: Holt, Rinehart, & Winston, 1965.

Ward, W. C. Creativity in young children. Young Development, 1968, 39, 737-754.

Name of Measure: **Verbal Facility Test by OEO in Equal Opportunity Survey 1965: Teacher Questionnaire, Part IV**

Variables Measured: **Verbal facility**

Status	Age-Grade Level						Teacher
	3⅓	4⅓	K	Gr.1	Gr.2	Gr.3	
Ready to Go							X
In Development							

Data Collection Method: **X** Group Test ____ Interview

____ Individual Test ____ Observation

Estimated Administration Time (min.): **15 minutes**

Brief Statement of Procedure: **Thirty multiple-choice questions. Teacher (S) marks the space on the answer sheet corresponding to the word that best fits in with the meaning of the sentence.**

Minimum Requirements for the Administrator-Observer: **Self-administered**

Supporting Statement: **The Coleman Report (1966) seems to suggest that verbal facility is an important teacher variable. This test will provide a check on earlier research and will allow investigation into the interactions of teacher's verbal facility and other teacher variables with student achievement.**

Coleman, J. S., Campbell, E. Q., Hobson, C. J., McPartland, J., Mood, A.M., Weinfeld, F. D., York, R. L. Equality of Educational Opportunity. (Final report to the U. S. Office of Education, OE-38001.) Washington, D. C.: U. S. Government Printing Office, 1966.

Name of Measure: **Vigor Measures**

Variables Measured: **Vigor measures**

Status	Age-Grade Level					
	$3\frac{1}{2}$	$4\frac{1}{2}$	K	Gr.1	Gr.2	Gr.3
Ready to Go	X	X	X	X	X	X
In Development						

Data Collection Method: ___ Group Test ___ Interview

_X_ Individual Test ___ Observation

Estimated Administration Time (min.): **5-10 minutes**

Brief Statement of Procedure: **Three relatively simple vigor measures are proposed: running time, number of turns on a crank, turning machine, and length of broad jump. These could be used as filler items for other variables and at the same time give a measure of activity and vigor levels.**

Minimum Requirements for the Administrator-Observer: **Stop watch recording.**

Supporting Statement: **These measures are proposed in order to determine the relationship, if any, of level of motor activity to the cognitive variables under investigation.**

Name of Measure: Visual examination

Variables Measured: Vision: acuity, motility, etc.

Status	Age-Grade Level					
	3½	4½	K	Gr.1	Gr.2	Gr.3
Ready to Go	X	X	X	X	X	X
In Development						

Data Collection Method:

____ Group Test

____ Interview

X Individual Test

____ Observation

Estimated Administration Time (min.): 10 minutes

Brief Statement of Procedure: See attached examination form.

Minimum Requirements for the Administrator-Observer: Doctor of Optometry or Doctor of Ophthalmology

Supporting Statement:

Visual Examination Form

NAME_____ AGE:_____
(last) (first) (m)
Were glasses worn for test? ( )YES ( )NO. DATE:_____

	PASS	FA

1. Visual Acuity at Distance:
   Picture Chart*
   O.D. 20/
   O.S. 20/
   O.U. 20/

   Visual Acuity at Near:
   Picture Chart
   O.D. 20/
   O.S. 20/
   O.U. 20/

2. Far Measure: Static Retinoscopy
   Normal-Emmetropic. More than +1.25 Hyperopia. More than -0.50 Myopia. More than +1.00 Astigmatism.
   O.D._____ O.D._____ O.D._____ O.D._____
   O.S._____ O.S._____ O.S._____ O.S._____

3. Near Measure: Retinoscopy within 16 inches with picture cards. Book Retinoscopy: Record accommodative effort as adequate or inadequate.
   O.D._____
   O.S._____

4. Cover Test and Pen Light Test: Distance and Near Fixation.
   Normal _____ Tropia _____ ( )D ( )N High Eso-or-Exo-phoria. _____ _____ ( )D ( )N

5. Ocular Motility: Dangled Bell or Penlight Pursuits.
   Normal_____ Abnormal_____

6. Near Point of Convergence: _____inches.

7. Externals and Ophthalmoscopy.

	Normal	Abnormal
(a). Externals		
Lids	_____	_____
Conjunctiva	_____	_____
Cornea	_____	_____
Iris	_____	_____
Pupillary Reflexes	_____	_____
(b). Ophthalmoscopy		
Media	_____	_____
Lens	_____	_____
Optic Disc	_____	_____
Macula	_____	_____
Fundus	_____	_____

8. Tests for Binocular Vision: Use test which yields best response.
   (a) Stereofly Pass_____ Fail_____ (b) Red glass response Pass_____ Fail_____ (c) Vertical Prism Pass_____ Fail_____

EXAMINER: _____

*Or Directional "E" or Snellen Acuity Charts, as appropriate for age group.

Name of Measure: Visual Perception Inventory: Position-in-Space Subtest (Stern)

Variables Measured: Form discrimination--rotations

Status	Age-Grade Level					
	3½	4½	K	Gr.1	Gr.2	Gr.3
Ready to Go		X	X	X	X	X
In Development						

Data Collection Method: X Group Test (K-Gr.3) ____ Interview
X Individual Test(3½-4½) ____ Observation

Estimated Administration Time (min.): 5-10 minutes

Brief Statement of Procedure: S is presented with a stimulus and asked to point out the matching stimulus.

Minimum Requirements for the Administrator-Observer:

Supporting Statement: Discrimination of rotations is an important skill in learning to read (e.g., being able to tell the difference between b & d; see E. Gibson, et al, 1962).

K - R 20 Reliability based on 291 children from high and low SES backgrounds between ages 3 and 5 in low 90's.

Analyses of variance yielded main effects of age and race, no main effects of sex or SES being obtained.

Gibson, E., & Gibson, J., Pick, A., & Osser, H. A developmental study of the discrimination of letter-like forms. Journal of Comparative and Physiological Psychology, 1962, 55 (6), 897-906.

Name of Measure: Wechsler Adult Intelligence Scale--Vocabulary, Information, Block Designs, and Picture Completion subtests
Variables Measured: General ability (verbal comprehension, analytical functioning)

Status	Age-Grade Level						Adult
	3½	4½	K	Gr.1	Gr.2	Gr.3	
Ready to Go							X
In Development							

Data Collection Method: ____ Group Test ____ Interview
X Individual Test ____ Observation

Estimated Administration Time (min.): 20-45 minutes

Brief Statement of Procedure: See WAIS manual.

Minimum Requirements for the Administrator-Observer: Administrator must be thoroughly trained in administration of the subtests, especially the Block Designs and Vocabulary subtests. It is likely that an unusually competent and verbal high school graduate could be trained to give the tests provided he/she is responsible and relates well with people.

Supporting Statement: It is proposed to administer four subtests of the Wechsler Adult Intelligence Scale (WAIS) to the mothers of the children. This testing is to be done during the second year of contact with the parent, presumably while the child is being tested Delaying the testing of the parent until the second year will allow establishment of better rapport before testing and, since the WAIS subtests are quite stable among adults, should cause no loss of information over what would have been obtained by testing during the first year.

The four subtests chosen are Vocabulary, Information, Block Designs, and Picture Completion. The Vocabulary and Information subtests should give a fairly accurate representation of the parent's assimilation of the kinds of knowledge stressed by traditional American education and also of the "verbal comprehension" factor of the Wechsler scales (see "measurement of analytical functioning" section of report for description of factors of Wechsler scales). Since mother's amount of schooling and verbal competence have been found to relate significantly to the young child's cognitive and linguistic performance and to his educability, these subtests will provide a relatively quick and crude index of the cognitive environment in the home.

Block Designs is the subtest most consistently loading on the "analytical functioning" factor of the WAIS (and WISC), and will allow us to explore mother-child relationships on this variable. The Picture Completion subtest is somewhat less clear in its factor structure. This subtest has been shown (Witkin et al, 1962) to correlate substantially with measures of field independence, but it loaded on a separate specific factor in Cohen's (1957) factor analysis of the WAIS. Picture Completion was the performance subtest most substantially correlated with the second-order G factor in Cohen's study. An abbreviated form of the WAIS comprised of the above four subtests has been estimated to correlate .96 with the full scale score (Maxwell, 1957) and can thus be used to yield an estimate of the mother's conventional IQ if that is desired.

Cohen, J. The factorial structure of the WAIS between early adulthood and old age. Journal of Consulting Psychology, 1957, 21, 283-290.

Maxwell, E. Validities of abbreviated WAIS scales. Journal of Consulting Psychology, 1957, 21, 121-126.

Witkin, H. A., Dyk, R. B., Faterson, H. F., Goodenough, D. R., & Karp, S. A. Psychological differentiation. New York: John Wiley & Sons, Inc., 1962.

APPENDIX d

Index to Proposed Measures, by Variable

Index to Proposed Measures, by Variable

ability, general: Cooperative Preschool Inventory (Caldwell); TAMA General Knowledge; Wechsler Adult Intelligence Scale (Vocabulary, Information, Block Designs, and Picture Completion subtests); Wechsler Intelligence Scale for Children (Block Designs, Picture Completion); Wechsler Preschool Primary Scale of Intelligence (Block Designs, Animal House, Picture Completion)

achievement - motivation: Gumpgookies

achievement pressure: Home Interview

analytical functioning: Children's Embedded Figures Test; Portable Rod-and-Frame Test; Preschool Embedded Figures Test; Wechsler Adult Intelligence Scale (Block Designs, and Picture Completion subtests); WPPSI and WISC (Block Designs, Picture Completion subtests)

approximation, concept of: Cooperative Primary Tests (Mathematics, Forms 12B, 23A, 23B)

arithmetic computation: Supplementary Computation Exercises

articulation (phoneme and word): Massad Mimicry Test

aspiration level: Etch-a-sketch; Home Interview

attention: Relevant Redundant Cue Concept Task -- see also: fixation time

attitude (interpersonal, racial): Social Schemata

attitudes towards education: Home Interview; Teacher Questionnaire, Form 581-06 (Approach to Teaching)

audition: Auditory Screening

auditory discrimination: Auditory Discrimination Test (Wepman); Children's Auditory Discrimination Inventory (Stern)

birth condition: Apgar Score (available from hospital records)

class, perception of: Teacher Questionnaire, Form 581-06 (Approach to Teaching)

classroom atmosphere: Ryans/ORF Scales (ETS Modified)

cognitive - perceptual stimulation: Ryans/ORF Scales (ETS Modified)

cognitive styles (preferred categorizing mode): Sigel Conceptual Style Sorting Task

community resources, knowledge and utilization of: Home Interview

compensations made in cases of debilitating illness: Teacher Questionnaire on Child's Health

comprehension and interpretation - verbal skills: ETS Story Sequence Task (Part II)

compensations made in cases of debilitating illness: Teacher Questionnaire on Child's Health

concept formation: ETS Logical Reasoning Tests; Eight Block Sorting Task; Hess and Shipman Toy Sorting Task; Sigel Conceptual Styles Sorting Task; Picture Block Test; Relevant Redundant Cue Concept Task; Tanaka Classification Test

concreteness (abstractness of conceptual or belief systems): The Conceptual Systems Test; The "This I Believe" Test

configurations: Johns Hopkins Perceptual Test

cooperation: Eight Block Sorting Task; Etch-a-sketch; Hess and Shipman Toy Sorting Task; Home Interview; Teacher Questionnaire, Form 581-06 (Approach to Teaching)

coordination, eye-hand motor: Seguin Form Board

copying skill: Etch-a-sketch

creativity: Ideational Fluency Tests; Naming Category Instances; Open Field Test; TAMA Tell-a-Story Task; Uses Test

distractability: Fruit-Distraction Type Test; Head Start Inventory of Factors Affecting Test Performance; Open Field Test; Stroop Color-Word Interference Task

egocentrism: Conception of Natural Events; ETS Spatial Egocentrism Task

energy level, child: Teacher Questionnaire on Child's Health

estimation, concept of: Cooperative Primary Tests (Mathematics, Forms 12B, 23A, 23B)

fixation time: Classroom Observation Rating Scale; Head Start Inventory of Factors Affecting Test Performance

form analysis: Analysis of Visually Perceived Forms

form discrimination -- see, configurations; coordination, rotations

form reproduction: Developmental Test of Visual-Motor Integration

form synthesis: Synthesis of Visually Perceived Forms

frustration tolerance: Classroom Observation Rating Scale; Classroom Teacher Rating Scale; Head Start Inventory of Factors Affecting Test Performance; Open Field Test

function and relations, concept of: Cooperative Primary Tests (Mathematics, Forms 12B, 23A, 23B)

functor words, comprehension of: Harvard Story Completion Test

geometry, concept of: Cooperative Primary Tests (Mathematics, Forms 12B, 23A, 23B)

goals for effectiveness: Home Interview; Principal's "Job Description" Questionnaire; School Information Questionnaire; Teacher Questionnaire, Form 581-06 (Approach to Teaching)

gratification, ability to delay: Mischel Technique

height and weight: Child's height and weight

identify, conservation of: Kohlberg and DeVries Sex Role Constancy; Tanaka HAT Test

ideology, left- versus right-wing: Polarity Scale

illness, child's reactions to: Teacher Questionnaire on Child's Health

impulsivity: Motor Inhibition Test -- see also: gratification, ability to delay; reflection-impulsivity

incidental learning: Fruit-Distraction Test

individuation of child: Home Interview

information processing: Eight Block Sorting Task; Etch-a-sketch; Hess and Shipman Toy Sorting Task

interests: Classroom Observation Rating Scale; Fixation Time (selective attention); Northwestern University Interest Inventory (ETS Adaptation); Open Field Test; PROSE

labeling: Cooperative Preschool Inventory (Caldwell); Peabody Picture Vocabulary Test

learning ability -- see concept formation, learning set

learning set: Relevant Redundant Cue Concept Task (Second Administration)

letter discrimination: Cooperative Primary Tests (Word Analysis, Forms 13A, 13B)

letter naming: The Harrison-Stroud Reading Readiness Profiles (Test 6, Giving the Names of the Letters)

level of glucose, protein, albumin, blood cells, and bacteria: Urinalysis

listening -- see, listening comprehension; receptive skill; word and sentence properties, recognition of, through listening

listening comprehension: Cooperative Preschool Inventory (Caldwell); Cooperative Primary Tests (Listening, Forms 12B, 23A, 23B); ETS Communications Skills (V-5); ETS Story Sequence Task (Part I)

locus of control: Home Interview; Internality-Externality Scale (Shipman); Internality-Externality Scale (modification based on Rotter's Internality-Externality Scale and Shore's Parental Questionnaire)

maternal control strategy: Eight Block Sorting Task; Etch-a-sketch; Hess and Shipman Toy Sorting Task; Home Interview

measurement, concept of: Cooperative Primary Tests (Mathematics, Forms 12B, 23A, 23B)

medical status: Child and Family Medical History Report Form; Physical Examination

memory: Form Memory (elements of the Johns Hopkins Perception Test and the Visual Perception Inventory with modified administration procedure); Stanford Memory Test

negative reinforcement: Eight Block Sorting Task; Etch-a-sketch; Hess and Shipman Toy Sorting Task; Home Interview; PROSE; Ryans/ORF (ETS Modified); Teacher Questionnaire, Form 581-06 (Approach to Teaching)

number, concept of: Conservation of Discontinuous Quantity; Cooperative Primary Test (Mathematics, Forms 12B, 23A, 23B); ETS Correspondence Task; ETS Spatial Enumeration; Seriation and Ordinal Correspondence

operation, concept of: Cooperative Primary Tests (Mathematics, Forms 12B, 23A, 23B)

parental influence, perception of: Teacher Questionnaire, Form 581-06 (Perception of disadvantaged)

peer preference: Play Situation - Picture Board Sociometric Technique

perception of the disadvantaged: Teacher Questionnaire, Form 581-06 (Perception of disadvantaged)

perceptual integration: Synthesis of Visually Perceived Forms (Birch and Lefford)

planfulness: Eight Block Sorting Task; Etch-a-sketch; Hess and Shipman Toy Sorting Task; Open Field Test

positive reinforcement: Eight Block Sorting Task; Etch-a-sketch; Hess and Shipman Toy Sorting Task; Home Interview; PROSE; Ryans/ORF Scales (ETS Modified); Teacher Questionnaire, Form 581-06 (Approach to Teaching)

powerfulness, feelings of: Home Interview; Internality-Externality Scales

principal performance: Performance Ratings for School Principals; Principal Behavior Description Questionnaire; Teacher Reaction Form

punctuation-capitalization: Cooperative Primary Tests (Writing Skills, Forms 23A, 23B)

quantitative concepts -- see, approximation, concept of; estimation, concept of; function and relation, concept of; geometry, concept of; measurement, concept of; number, concept of; operation, concept of; symbolism, concept of

reading -- see, reading comprehension; word meaning, recognition of, through reading; word properties, recognition of, through reading

reading comprehension: Cooperative Primary Tests (Reading, Forms 12B, 23A, 23B)

reflection-impulsivity: Matching Familiar Figures Tests; Sigel Conceptual Styles Sorting Task

resources and facilities, Head Start: Center Facilities and Resources Inventory

risk taking: Risk Taking Tasks

rotations: Visual Perception Inventory (Position-in-Space subtest)

school description: School Information Questionnaire

self-concept: Brown IDS Self-Concept Referents Test; Classroom Observation Rating Scale; Classroom Teacher Rating Scale; Test Situation Ratings of Children

sentence properties, knowledge of, through writing: TAMA Language Completion Test (Exercise A)

social motives: Classroom Observation Rating Scale; Classroom Teacher Rating Scale; Eight Block Sorting Task; Etch-a-sketch; Gumpgookies; Hess and Shipman Toy Sorting Task; Open Field Test; Play Situation - Picture Board Sociometric Technique; Test Situation Ratings of Children

social reinforcement, responsiveness to: Classroom Observation Rating Scale; Classroom Teacher Rating Scale

social status (demographic characteristics of household members, physical characteristics of dwelling place and neighborhood, home resources, language spoken in home): Home Interview

spelling: Cooperative Primary Tests (Writing Skills, Forms 23A, 23B)

stimulus differentiation: Fixation Time; Open Field Test

symbolism, concept of: Cooperative Primary Tests (Mathematics, Forms 12B, 23A, 23B)

teacher individuation of pupils: Teacher Individuation Test

teaching time estimates: Estimate of Time Spent on Certain Instructional Activities

test-taking behaviors: Head Start Inventory of Factors Affecting Test Performance; Modified Hertzig Procedure

verbal facility: Verbal Facility Test by OEO in Equal Opportunity Survey 1965 (Teacher Questionnaire, Part IV); Home Interview

verbal skills, oral productive -- see, comprehension and interpretation - verbal skills; ability, general; labeling; letter naming; verbal facility; verbalization, encouragement of; verbalization, spontaneous; verbalize sorting rationale, ability to; word and sentence properties, knowledge of; word naming

verbalization, encouragement of: Eight Block Sorting Task; Etch-a-sketch; Hess and Shipman Toy Sorting Task; Ryan/ORF Scales (ETS Modified)

verbalization, spontaneous: Eight Block Sorting Task; Etch-a-sketch; Hess and Shipman Toy Sorting Task; Modified Hertzig Procedure

verbalize sorting rationale, ability to: Eight Block Sorting Task; Hess and Shipman Toy Sorting Task; Picture Block Test; Sigel Conceptual Style Sorting Task

vigor: Vigor Measures

vision (acuity, motility): Visual Examination

word and sentence properties, knowledge of: Cooperative Primary Tests (Writing Skills, Forms 23A, 23B); Harvard Story Completion Test; Illinois Test of Psycholinguistic Abilities (Auditory-Vocal Automatic subtest); Massad Mimicry Test; TAMA Tell-a-Story Task

word and sentence properties, recognition of, through listening: Cooperative Preschool Inventory (Caldwell); ETS Matched Pictures Comprehension Task; Gray Oral Reading Tests

word and sentence properties, recognition of, through writing: Cooperative Primary Tests (Writing Skills, Forms 23A, 23B)

word copying: Clymer-Barnett Prereading Battery (Test 6, Copy-a-sentence); Cooperative Preschool Inventory (Caldwell)

word discrimination: Cooperative Primary Tests (Word Analysis, Forms 13A, 13B)

word meaning, recognition of: Peabody Picture Vocabulary Test

word naming: Gray Oral Reading Tests

word properties, knowledge of, through writing: TAMA Sentence Dictation Test; TAMA Write-a-Story

word properties, recognition of, through reading: Cooperative primary Tests (Word Analysis, Forms 13A, 13B); Gray Oral Reading Tests

writing -- see, comprehension and interpretation - writing; sentence properties, knowledge of, through writing; word and sentence properties, recognition of, through writing; word copying; word properties, knowledge of, through writing

APPENDIX e

Overview of Proposed Child Measures, Classified by General Area

Overview of Proposed Child Measures,* Classified by General Area

	Age		Grade			
	3½	4½	K	1	2	3
Reasoning and Analytic Styles						
Block Design: WPPSI and WISC		10	10	10	10	10
Children's Embedded Figures Test				15	15	15
ETS Logical Reasoning Tests (written exercises VI-4 and VI-5)			20	20	(20)	
Hess and Shipman Eight-Block Sorting Task	25	25	25	25	25	25
Hess and Shipman Toy Sorting Task (or equivalent)	15	15	15	15	15	15
Picture Block Test		15	(15)			
Picture Completion: WPPSI and WISC	5	5	5	5	5	5
Portable Rod-and-Frame Test			30	30	30	30
Preschool Embedded Figures Test	15	15	15			
Tanaka Classification Test					20	20
Attention, Learning, Memory						
Animal House: WPPSI		10	10			
Fixation Time	20	20	20	20	20	20
Form Memory		5	5	5		
Fruit-Distraction Test		10	10	10	(10)	
Relevant Redundant Cue Concept Task		15	20	20	20	20
Relevant Redundant Cue Concept Task Second Administration		15	15	15	15	15
Stanford Memory Test		10	10	10	10	10
Stroop Color-Word Interference Task					10	10
Attitudes, Interests						
Brown IDS Self-Concept Referents Test	10	15	15	15	15	15
Northwestern University Interest Inventory (ETS Adaptation)			30	30	30	30
Social Schemata (or equivalent)		15	15	15	15	15
Controlling Mechanisms						
I-E Scale (Locus of Control)		20	20	20	20	20
Kreitler Cognitive Orientation		15	30	30	30	30
Matching Familiar Figures Test	10	10	10	10	10	10
Mischel Technique	5	5	5	5	5	5
Modified Hertzig Procedure	0	0	0	0	0	0
Motor Inhibition Test	5	5	5	5	5	5
Risk-Taking Tasks	20	20	20	20	20	20
Sigel Conceptual Style Sorting Task	30	25	25	25	25	25

*Many measures cut across more than one general area; a measure is listed under the single general area that is most relevant. Column entries represent estimated administration time in minutes; a zero means that no additional time is required of the child; e.g., observation schedules; time in parentheses indicates possible special administration.

	Age		Grade			
	3½	4½	K	1	2	3
Creativity						
Children's Drawings			15	15	15	15
Ideational Fluency Tests			20	20	20	20
Naming Category Instances		15	(15)			
Uses Test (Nonverbal)	5	5	5	5	5	5
General Knowledge						
Cooperative Preschool Inventory (Caldwell)	20	20	20			
TAMA General Knowledge	10	10	20	20	20	20
General Personality						
Classroom Observation Rating Scale		0	0	?	?	?
Classroom Teacher Rating Scale		0	0	0	0	0
Head Start Inventory, Test Performance	0	0	0	0	0	0
Test Situation Ratings of Children	0	0	0	0	0	0
Perception						
Analysis of Visually Perceived Forms (Birch and Lefford)		10	10	10	10	10
Auditory Discrimination Test			5	5	5	5
Children's Auditory Discrimination Inventory	15	15				
Developmental Test of Visual-Motor Integration	10	10	10	10	10	10
Johns Hopkins Perceptual Test	15	15	15	15	15	15
Seguin Form Board	5	5	5			
Synthesis of Visually Perceived Forms (Birch and Lefford)			10	10	10	10
Visual Perception Inventory: Position-in-Space Subtest		10	10	10	10	10
Physical						
Apgar	0	0	0	0	0	0
Auditory Screening	10	10	10	10	10	10
Blood Test	2	2	2	2	2	2
Child and Family Medical History Report Form	15	15	15	15	15	15
Physical Examination	20	20	20	20	20	20
Teacher Questionnaire on Child's Health		5	5	5	5	5
Urinalysis	3	3	3	3	3	3
Vigor Measures	5	5	5	5	5	5
Visual Examination	10	10	10	10	10	10
Piagetian						
Conception of Natural Events		(10)	10	10	10	10
Conservation of Number		10	10	10	10	
ETS Spatial Egocentrism Task		10	10	10	10	10
ETS Enumeration	5	5	5	5	5	5
Physical Identity and Sex Role Constancy Tasks	5	10	10	10	10	10
Spontaneous Correspondence	5	5	5			

	Age		Grade			
	3½	4½	K	1	2	3
Quantitative						
Cooperative Primary Tests: Mathematics				50	50	50
Supplementary Computation Exercises					10	10
Social Motives						
Gumpgookies		25	25	25	25	25
Hess and Shipman Etch-a-Sketch Interaction Task	20	20	20	20	20	20
Open Field Test	20	20	20	20	20	20
Play Situation--Picture Board Sociometric Technique		15	15	15		
Verbal						
Clymer-Barret Prereading Battery: Test 6, Copy-a-Sentence				5	5	5
Cooperative Primary Tests: Listening				35	35	35
Cooperative Primary Tests: Pilot				10		
Cooperative Primary Tests: Reading				35	35	35
Cooperative Primary Tests: Word Analysis				40	40	40
Cooperative Primary Tests: Writing Skills					40	40
ETS Communications Skills V-5			10			
ETS Matched Pictures Comprehension Task	10	10	10			
ETS Story Sequence Task, Part I	10	10				
ETS Story Sequence Task, Part II	10	10	10			
Gray Oral Reading Tests				15	15	15
Harrison-Stroud Reading Readiness Profiles, Test 6, Giving the Names of Letters			5			
Harvard Story Completion Test			20	20	(20)	(20)
Illinois Test of Psycho-linguistic Abilities: Auditory-Vocal Automatic Subtest		10	10	10		
Massad Mimicry Test	10	10	10	10	10	10
Metropolitan Readiness Tests			35			
Peabody Picture Vocabulary and ETS Adaptation	20	20				
TAMA Language Completion Test, Exercise A					10	10
TAMA Language Completion Test, Exercise B					10	10
TAMA Sentence Dictation Test					10	10
TAMA Tell-a-Story Task	10	10	10	10	10	10
TAMA Write-a-Story					20	20

APPENDIX f

Selection of Study Sites

Selection of Study Sites

Criteria and Their Application

Some major criteria to be applied to site selection were discussed in the Interim Report (February 26, 1968, ETS). In summary, the sites to be selected were to have the following characteristics:

a. Each site would have year-long Head Start programs
b. The sites would provide variability in relation to:
   (1) geographical region
   (2) size (urban vs. rural)
   (3) availability of public kindergarten (or considerably less than universal attendance where kindergarten is available)
c. Each site would have some three to five elementary schools (yielding about twelve first grade classes) providing race and SES mix (where possible for <u>both</u> races)
d. Ideally, about half of the first grade classes enrolling study subjects would be in Follow Through programs by 1971 and half would not

Implicit in the discussion of the Interim Report were two additional criteria. The first was that the mobility rate in the selected schools would allow for a sample of approximately 1,000 children who remain in the study from age 3 1/2 through grade 3. The second criterion is a sine qua non which may bear statement at this time--there can be <u>no</u> study without active cooperation and interest from the community and the school administration.

Since the writing of the Interim Report, it has become obvious that criterion (a) above needs amplification. It will be necessary for the combined selection sites to reflect the wide variability among Head Start programs as they exist today and as they <u>may</u> evolve in the future (e.g., one-year programs, two-year programs [prior to grade 1 and prior to kindergarten], different local sponsors, and so forth).

With these criteria, ETS began to search for sites. As a first step some thirty school districts funded for both Head Start and Follow Through were considered. As the selection proceeded it appeared evident that the list of school districts was insufficient and two additional districts were added--Lee County, Alabama to obtain southern rural representation and Portland, Oregon to ensure far-western representation. A short list of nine school districts was generated when the other candidate school districts were eliminated for failing to meet one or more of the criteria.*

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*Communities were eliminated because they contained large Spanish speaking groups, e.g., Puerto Rico; Miami, Fla.; San Diego, Calif.; American Indian groups, e.g., Mission, S.D.; because they were too small for our purposes, e.g., Lebanon, Ind.; Pikeville, Ky.; Tupelo, Miss.; and because they duplicated chosen sites, e.g., Duluth, Minn; Des Moines, Ia. (geographic duplication); and New York, N.Y. (large urban duplication).

The nine candidate school districts were:

Philadelphia, Pennsylvania
Racine, Wisconsin
Wabash Valley area, Indiana
Portland, Oregon
Berkeley, California
Los Angeles, California
Lee County, Alabama
Durham, North Carolina
Kirksville, Missouri

On first inspection, each of the sites met the requirements of the study design. This initial screening was carried out by personnel from ETS regional offices. Preliminary contact with the school authorities indicated a willingness to cooperate in the study, subject, of course, to a fuller description of the plan and its implementation. However, firm data on many of the technical requirements were lacking as well as any indication of "broad-based" community support. Therefore, it was decided that members of the Princeton project staff should visit each of the proposed sites for the dual purpose of obtaining such data and explaining the program. Such visits were carried out during the last week of July and the first three weeks of August 1968.

In each city the following procedures were included during the site visit:

a. A meeting with the superintendent of schools and his staff. The purposes of this meeting were to obtain information about expected first grade population by school, race, SES, and Head Start experience, and to explain the project and elicit a promise to obtain support from the Board of Education. In several instances ETS representatives attended Board meetings. Board approval was required in a few of the cities. In addition, because of the mobility of superintendents, it was deemed important to make cooperation in our study a matter of public policy.

b. A meeting with the responsible CAP agency. This session had the same general aims as the other meeting. A feature of this meeting was the insistence that some representation of the poor, both blacks and whites, be present. A CAP Board resolution was also requested for the same reasons as those given above.

Prior to the meetings, ETS had prepared an informal memorandum describing the study, its aims, and some of the benefits to the school system. This memorandum has received wide distribution in the areas that we considered.

As a result of these visits, ETS received assurances of cooperation from all nine candidate communities on the short list (see above). Naturally it was not feasible to include all these communities in the study. The following

were eventually eliminated for the reasons given:

a. Kirksville, Missouri. The total number of Head Start children did not exceed 150. Of these, a sizable proportion were children of college students who can be expected to have considerable intellectual stimulation in the home and who tend to contribute to a high mobility rate.

b. Los Angeles, California. With the exception of the Watts and Compton areas, no district could be found that contained only white and black students. All districts had significant Mexican-American, American Indian, or Oriental populations.

c. Durham, North Carolina. Although this area is close to an ETS regional office, the failure to find significant numbers of white Head Start children ruled it out as a viable site. Furthermore, our interest in Durham County was based primarily on the possibility that it could be considered "southern rural." Unfortunately, our information indicated that the area is rapidly becoming suburban with few people owing their livelihood directly to farming pursuits.

d. Berkeley, California. This city was eliminated largely on administrative grounds. A major factor was the uncertainty with respect to the stability of the classroom and even school populations. In order to integrate the district a new bussing plan was adopted in September 1968. The new bussing plan expanded school feeding districts to an unmanageable size. There remained the underlying fear that changes in these feeding districts might subsequently occur thereby unnecessarily complicating our study.

e. Wabash Valley, Indiana. This rural, white area was eliminated for the following reasons: (1) It would have been administratively difficult to cover and control the four counties needed to provide a sufficient number of subjects. (2) Its distance from the nearest ETS office (Evanston, Illinois) would have made meaningful technical coordination difficult. (3) Preference was given to sites having both black and white children.

We were then left with the following four communities:

Philadelphia, Pennsylvania
Racine, Wisconsin
Portland, Oregon
Lee County, Alabama

The original plan had suggested that the study would be carried out in six communities. This was an arbitrary number based largely on speculation as to how many sites would be needed to obtain the initial two thousand children with diverse backgrounds in diverse communities. An examination of the four communities which had met the criteria for site selection indicated clearly that the study could legitimately be carried out without additional sites being included. The following pages will document this more fully but in general it should

be noted that a very wide range of educational comparisons could be made (e.g., Head Start vs. non-Head Start, two years vs. one year Head Start, Head Start and kindergarten vs. no preschool educational experience). As well, geographic, racial, and SES variations would permit valid research and evaluation generalizations to be made from the data to be collected.

Finally, reducing the number of study sites from six to four communities allows us to include more children in each site so that even with expected attrition the third grade sample will be large enough for meaningful analysis by community.

The following five tables (see f-5) show estimates (rounded) of major subjects who can be expected to remain in the study districts for each year of the study. These figures are based on grade 1 enrollments for 1967-68 and past mobility rates in the areas. In light of possible population increases in some areas, the numbers may be underestimates.

Characteristics of the Selected Sites

a. Philadelphia, Pennsylvania. Philadelphia has a population of approximately 2.5 million, of which about 45% are nonwhite. Approximately 300,000 children attend public school. Some 60% of these children are nonwhite. In Philadelphia, Head Start is a two-year program prior to the kindergarten year. Five thousand children are currently enrolled in Head Start and approximatley 45% of these will have attended the program for two years. The school system of Philadelphia has become one of the more innovative large systems in the United States and would seem to provide the style and competency of leadership necessary to the successful carrying out of a longitudinal study.

Within the Philadelphia school system five schools were selected (in districts 3, 5, and 6) as good candidates. These schools and their racial mix are as follows:

School	Grade 1	Race	
		W	N
Elkin	143	141	2
Kirkbride	108	58	50
Vare	114	79	35
Willard	80	72	8
Wister	146	3	143
Total	591	353	238

Firm figures on Head Start attendance of the present first grade classes in these candidate schools are not presently available. However, based on personal reports from school officials, a figure of 50% would not be wide of the true figure. It is probable that as many as two-thirds of the pupils in our candidate schools would qualify under poverty guidelines. Some variability in SES (for both races) is reflected in the choice of these schools.

Table f.1

		Pre-preschool (age ≐ 3 1/2)	HSI or 0 (age ≐ 4)	K, HS2, or 0 (age ≐ 5)	Grade 1 (age ≐ 6)	Grade 2 (age ≐ 7)	Grade 3 (age ≐ 8)
Philadelphia, Pennsylvania	1968-69	600(250*)					
	1969-70		600(250*)				
	1970-71			480(200*)			
	1971-72				384(160*)		
	1972-73					307(128*)	
	1973-74						246(103*)
Racine, Wisconsin	1968-69	475					
	1969-70		475				
	1970-71			404			
	1971-72				343		
	1972-73					292	
	1973-74						248
Portland, Oregon	1968-69	385					
	1969-70		385				
	1970-71			346			
	1971-72				311		
	1972-73					280	
	1973-74						252
Lee County, Alabama	1968-69	450					
	1969-70		450				
	1970-71			382			
	1971-72				325		
	1972-73					276	
	1973-74						235
Total	1968-69	1910(250*)					
	1969-70		1910(250*)				
	1970-71			1612(200*)			
	1971-72				1363(160*)		
	1972-73					1155(128*)	
	1973-74						981(103*)

*Philadelphia participants, age ≐ 2 1/2, who will be eligible for first grade in 1972-73. A two-year HS prior to K is available in Philadelphia.

However, it should be realized that schools having substantial SES variability are hard to find in urban settings unless the school districts have been extensively gerrymandered or there are highly organized plans for bussing.

b. Racine, Wisconsin. This is a community of somewhat over 100,000, of whom approximately 20% are nonwhite. The black community, mostly recent immigrants from the south, is largely concentrated in an area bordering Lake Michigan. The children from this community attend eight elementary schools. Some of these schools are involved in studies being conducted by the University of Wisconsin's Research and Development Center for Cognitive Learning. By careful coordination with the R & D Center, we will be able to investigate what the effects are of being a student in an innovative, research-oriented school setting. The social unrest of the poorer black residents is relatively low, as indicated by the predominance of such relatively moderate groups as the NAACP and Urban League. Racine is an industrial town having the Case Tractor and Johnson's Wax companies as the major employers. In spite of relatively high employment, about two-thirds of the children in our candidate schools come from families that would be classified as low SES.

Five candidate schools in Racine were selected with the populations as given below:

School	Grade 1 Total	Race W	Race N
Bull	157	41	116
Franklin	82	26	56
Garfield	65	7	58
Jefferson	109	46	63
Winslow	56	38	18
Total	469	158	311

Approximately one-third of the first graders will have had Head Start experience. Like Philadelphia, Racine has a two-year Head Start program prior to kindergarten. However, of those children having Head Start experience, only one in four can be expected to have attended classes for two years.

c. Portland, Oregon. The population of Portland is about 400,000, of whom 20,000 are nonwhite. Most of these are concentrated in the Albina area along a river which bisects the town. There is a relatively strong but moderate civil-rights group in the nonwhite community. Portland's Head Start program contains approximately 500 children and is one year in length. Four schools have been selected as likely candidate sites as follows:

School	Grade 1 Total	Race		#Having Head Start Experience		SES Mix		
		W	N	W	N	Low	Med	High
Humboldt	90	4	86	1	46		X	
Irvington	78	32	46	6	15	W i d e	R a n g e	
King	135	11	124	2	29		X	
Sabin	81	42	39	6	9	W i d e	R a n g e	
Total	384	89	295	15	99			

d. Lee County, Alabama. Lee County is almost entirely rural with farm occupations predominating. It is located on the east central border of the state about 50 miles northeast of Montgomery. There are only two population centers in the county--Auburn and Opelika. Both of these cities are under 14,000 population. Three school systems, quite segregated, cover the county--Auburn City Schools, Opelika City Schools, and Lee County Schools. Because of our desire to have broad representation of the Southern educational pattern, we are working with both small urban schools and county schools. The sample description for the county schools is as follows:

School*	Grade 1 Total	Race W	Race N
Beauregard	58	58	0
Boykin	79	0	79
Cary Woods	53	42	11
Loachapoka Junior High	54	0	54
Sanford	66	0	66
Smith Station	100	100	0
Smith Station Elem.	31	0	31
Dean Road Elem.	89	89	0
Total	530	289	241

About one-third of both the white and black pupils fall under the poverty guidelines and attend Head Start. The Head Start program in Lee County is a one-year program which substitutes for kindergarten. This is a common practice in the South, and the inclusion of children with this experience will be helpful for evaluational research.

Summary of Sample

Summarizing the data given on the previous pages, it is estimated that the proposed study sample will have the following

*Updated December 1968.

characteristics:

City	Total W	Sample N	Experience Preschool H.S.	Experience No H.S.
Philadelphia, Pa.*	353	238	295	296
Racine, Wisconsin	158	311	187	282
Portland, Oregon	89	295	114	270
Lee County, Alabama	200	241	147	294
Total	800	1,085	743	1,142
	1,885			

These numbers are deemed adequate for the purposes of the study and generally representative of possible Head Start patterns found in the country. One should bear in mind that at no time has ETS asserted that a stratified and representative sample would be drawn. There are too many contingencies inherent in doing field research to make such a procedure feasible. Instead, the procedure has been to insist upon representation of major patterns. This we feel, has been done.

Additional notes on sites selected as replacement for Philadelphia and Racine:

a. Trenton. To select the schools in Trenton, we began with a list of all the elementary schools in the City. Information was available on the number of students in the school, the number of students in each kindergarten, and the proportion of each race (white, Negro, Puerto Rican, other) for the school. We also had available the schools to which the Head Start centers had previously sent students. The number of children of Head Start age by race per school was estimated by assuming that the racial proportions in the school could be applied to the number of kindergarten students.

   The distribution of kindergarten children in Trenton is therefore: white 354, Negro 1,036, Puerto Rican 87, and about a handful of others. Percentagewise, there are 70% Negro, 24% white, and 6% Puerto Rican. Presently, there are 240 students registered in Head Start programs in Trenton, all of whom are Negro except about four.

   The aim of having a 60/40 Negro/white ratio and about 50/50 Head Start/Non-Head Start ratio is thereby impossible. If we insist on the Negro/white mix, then our Head Start sample will diminish, and to approach the 50/50 Head Start/ Non-Head Start ratio would eliminate all white students from the sample.

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*In addition, a sample of about 250 children who will be eligible for grade 1 in 1972-73 will be included.

On conferring with Walter Emmerich, Sam Barnett, and Conrad McLean, we have decided on a compromise which seems more or less satisfactory. We have selected three schools which are fed from two Head Start centers (Grant, Jefferson, and Jr. No. 5) and two schools which are fed by one Head Start center but contain a substantial number of whites. By so doing, the estimated sample size is 499 with 18% white, 76% Negro, and 6% Puerto Rican.

b. St. Louis. Information was available on two similar school districts containing about a dozen schools located closely together. Careful consideration of the properties of the schools, the Negro/white ratio, and with an eye towards schools with various percentages of Negro students, six schools were selected. The estimated sample size is 558 and the Negro/white ratio 60/40. The sample contains two all-Negro, one mostly Negro, two mostly-white and one all-white schools.

School	W	N	PR	T
Grant	6	117	16	139
Jefferson	8	139	5	152
Jr. #5	1	40	3	44
Jr. #2	55	42	3	100
Jr. #3	22	40	2	64
Total	92	378	29	499

Map No.	School	N	W	T
157	Jefferson	99	0	99
161	Henry	144	0	144
163	Webster	13	67	80
158	Jackson	57	22	79
149	Blair	20	58	78
148	Ames	0	78	78
	Total	333	225	558

Disadvantaged Children and Their First School Experiences

ETS-OEO Longitudinal Study

Theoretical Considerations and Measurement Strategies

Report under
OEO Contract Number 4206
and
OEO Grant Number CG-8256

Educational Testing Service
Princeton, N. J.

December 1968

Preface

This report covers the period February 26, 1968 (the date of the Interim Report under Contract Number 4206) until the middle of January 1969. The December date on the cover corresponds to the date of the draft discussed with Dr. Edward Zigler, Yale University (representing the OEO Head Start Research Advisory Council), and Dr. Lois-ellin Datta, OEO Head Start Research. We are grateful to both of them and to other representatives of OEO for valuable suggestions reflected in revisions of the manuscript and in the overall shape of the study.

The Interim Report, in its emphasis on longitudinal assessment, an interactional model of human development, and the interdependence of evaluative and basic research, anticipated many of the arguments of the present volume. However, the considerations and experiences of the intervening months have enabled us to couch these arguments in the more comprehensive conceptualization and the more specific measurement strategy which the imminence of the first assessment requires. This is not to suggest that every detail of the theoretical framework, the measures, or even the design is fixed. Indeed, it is not far-fetched to ascribe virtue to the very kind of flexibility that our first research textbooks decried. First, the world of the ghetto or rural poverty of children who are the focus of our interest is not a textbook world. (And, incidentally, if Head Start had waited for the textbooks to be written to tell how it should be done, it wouldn't be.) The study will have to make constant adaptations to this world; certainly this world is not going to adapt to a randomized, factorial research design. Furthermore, in the tortuous process of balancing theory, empirical risk, public relations, and costs, we are bound to have made a few debatable decisions in the planning of the effort. (We deliberately chose to err on the side of including instrumentation that might be less-than-perfect rather than leave out representation of some of the more conceptually compelling variables.) Then, too, there are going to be some times when, persuaded by rationality or data, we simply change our minds. Or new professional ground may be broken in fields such as the personal-social, which have been less than fertile in the past. As Melvin Tumin has pointed out many times, one of the most significant things about this unprecedented research venture may be what it tells us about how to do research in the future.

Of course, these equivocations are not meant to suggest that the most substantial part of our assessment will not have appropriate comparabilities across time. After all, that is what a longitudinal study is all about.

We are beginning the operational part of the study almost immediately with the 3 1/2 year old groups in Lee County (Alabama), St. Louis, Portland (Oregon), and Trenton (New Jersey). Our next report will describe how the initial data collection phase went.

Continued

The other members of the Steering Committee, Edmund Gordon, Marshall Smith, Silvan Tomkins, and Melvin Tumin, join us in proud and enthusiastic tribute to the accomplishments of members of the ETS staff and consultants during the last few months--especially Virginia Shipman, Samuel Ball, and Joseph Boyd. The author listings on the chapters indicate where other major credit is due. A complete listing of project personnel is included as Appendix a.

Scarvia Anderson
Albert Beaton
Walter Emmerich
Samuel Messick

Princeton, New Jersey
January 17, 1969

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A. OVERVIEW OF THE ETS-OEO LONGITUDINAL STUDY OF DISADVANTAGED CHILDREN*

Scarvia B. Anderson

ETS, under OEO auspices, is embarking on a comprehensive study of the cognitive, personal, and social development of disadvantaged children over the crucial period from age 3 to grade 3. In very general terms, the aims of the study are to identify the components of early education that are associated with children's development, to determine the environmental and background factors that influence such associations, and, if possible, to describe how these influences operate.

We should then be in a position to suggest what kinds of programs educational institutions might consider to bridge the gap between the disadvantaged and the more affluent, and to provide information useful to federal, state, and local planning agencies involved in problems of the poor.

However, before we get into the details of the plans for this ambitious study, let us take a look at what the target population is like. Actually, "target population" seems a very cold term for some 2000 children who are about three and a half years old as the study gets underway. Because of the particular concerns of the investigators and the sponsor, the children are poor. Many of them are black. Now, we are familiar with all the usual negatives about such subjects: They live in city ghettos or rural shacks. They play with string and boxes instead of the latest items from Creative Playthings. Sometimes one or both parents are missing from the home; frequently the parents are not what would be described in "middle-class" jargon as "satisfactory models"; they may project an image of defeat and helplessness. A few of the children may actually have brain damage; many of them suffer from malnutrition or lack of attention to correctable disorders. The language they speak, and hear spoken, is more than unacceptable--it is uninterpretable --to many of us. And "outsiders" may throw up their hands in horror at the thought that a color TV may rate higher on the family scale of values than proper food, clothing, or bedding.

But these children have two very powerful things going for them. First, they are eager, curious, and young--young enough that it is still possible to help develop in them some kind of foundation for a happy and productive life. Second, most

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*From a speech presented at a special symposium of the National Council on Measurement in Education, New York City, November 1, 1968.

Table A.1

SUBJECTS

Group 1--Major Ss of the study (eligible for first grade in 1971-72) who stay in the study districts. They are identified in spring 1969 and followed intensively through grade 3. N ≙ 2000 in 1969, 1000 in grade 3.

Group 2--Major Ss who move out of the study districts but are still assessed once a year. N ≙ 850 in grade 3.

Group 3--Classmates of major Ss--children who move into study districts after initial identification of group 1. N ≙ 550 in grade 1, 950 in grade 3.

Group 4--Cross-sectional comparison group (comparable school districts), assessed in Head Start and again in grade 3 in study of effects of assessment procedures themselves. N ≙ 450 in HS, 250 in grade 3.

Groups 5, 6, 7, 8, 9--Cross-sectional comparison groups (same school districts) assessed in 1969-70: HS, K, grade 1, grade 2, grade 3. (It is considered desirable to pick up additional cross-sectional comparison groups across the educational levels of the study in 1973-74 in order to assess program changes.)

of them have some adult or adults in their lives who want more than anything else for things to be <u>better</u> for their children and who lend tremendous emotional, if not always intellectual, support to this aim.

Education is viewed as the major way to implement the aim, and, for the majority of children in the study, parents will make sure that they attend an educational program at the earliest possible opportunity. That educational program is known nationally as "Head Start."

The study design involves children in about twenty-three elementary school sending districts in four geographical locations. The candidate locations are three cities varying in size, stability of the population, and degree of organization of the Negro community and one rural-small town area in the South. All the locations have Head Start available but the general outlines of the programs vary, reflecting the structural and curriculum differences of programs around the country. The children to be studied are divided into nine groups, as indicated in Table A.1.

To obtain the major subjects of the study--group 1--we shall enter the designated school districts in the spring of 1969 and by door-to-door canvassing try to locate every child who will be eligible to enter the first grade in the fall of 1971. Of course, participation by these children in the study will be dependent on parental permission and cooperation. The cross-sectional comparison groups will be chosen from the same locations with the cooperation of local school and Head Start authorities.

Here is a summary of some of the principal features of the study design:

1. The plan relies upon "natural" rather than "contrived" groups--parent decisions about sending or not sending children to Head Start or kindergarten will be made in the ordinary way.

2. The study subjects will be black or white children from English-speaking backgrounds. For feasibility reasons, we did not wish to add the complications and numbers which the inclusion of Mexican-American, Puerto Rican, American Indian, and other special subgroups would entail. We hope that comparable studies of these children can be undertaken in the future.

3. Where possible, we have selected racially mixed school districts and we have made a point of including at least one district in each location where there is substantial variability in socioeconomic status. To the extent possible, we have tried to ensure that race and SES are not completely confounded. (Race and SES are of special interest as we study the effects of different classroom mixes on children of both races and of both lower and middle classes.)

4. The cross-sectional comparison groups (groups 5, 6, 7, 8, and 9) are viewed as an important design addition, principally

Table A.2

MEASURES

Family, status and process--to be obtained from interviews and observation of parent-child interaction for children in group 1 at the time of identification and annually throughout the study. Family interviews will also be carried out for children in group 2 who move away from the study locations. For reasons of economy, only family status information will be obtained on children in comparison groups 3-9.

Physical--to be obtained from medical examinations for children in group 1 at the time of identification and periodically throughout the study. Such medical information as available from preschool and school records will be obtained for children in the comparison groups.

Perceptual, cognitive--to be obtained through tests for children in group 1 at the time of identification and annually throughout the study, and for children in all other groups annually or as long as they are in the study. Teacher and parent ratings of cognitive development will also be obtained where appropriate.

Personal-social--to be obtained from observations in free-play situations once children are in preschool, from test-like situations where appropriate, and from ratings by testers and teachers for all groups. Parents will also be asked to make ratings of children in groups 1 and 2.

Classroom, program and climate--to be obtained from detailed observation of teachers and children in the classroom, from global ratings by observers, and from teacher descriptions for all preschool and school classes attended by children in groups 1, 3, 5-9. Limited data in this domain will be obtained for groups 2 and 4.

Teacher, background, attitudes, abilities, goals--to be obtained through questionnaires for all teachers every year they are involved with children in the study. For children who move away (group 2), every attempt will be made to involve their teachers in providing this information.

School, climate and structure--to be obtained from observations and from questionnaires completed by teachers and administrators. In addition, parents of children in groups 1 and 2 will be asked annually to give their attitudes toward the schools and classes their children are in.

Community--to be monitored by local observers throughout the course of the study. Parents will also be asked about their perceptions of the community and their access to its power structure and facilities.

as they provide a source of baseline data against which to interpret longitudinal results. Comparisons should be especially relevant in communities experiencing major social changes or upheavals during the course of the study and with respect to the cumulative effects of compensatory education.

5. The purpose of re-assessing comparison group 4 is to study the effects on children's development of the assessment procedures themselves. In addition, comparison group 3 (children moving into the classes) will permit us to gauge the cumulative effects of different amounts of assessment over the period of the study. It is possible that the measurements could exert a greater influence on the children than some of the compensatory educational experiences! In any case, we need to find out.

Once we have the subjects of the study identified, what measures do we want to take on them--and why? For convenience, we are thinking in terms of several classes of measures which will be employed throughout the study. These broad classes of measures are listed in Table A.2: measures of the family; measures of the child's physical, perceptual, cognitive, and personal-social development; and measures of the teacher, classroom, school, and community.

The choices of what particular measures to emphasize and use are, of course, based on a number of considerations. They include the following:

1. The questions toward which the study is directed require repeated measures of related phenomena over time. We may choose to measure exactly the same kind of thing over time--breadth of vocabulary and goal directedness from age 3 through grade 3. Or we may measure characteristics which are judged to be precursors of later abilities of interest--visual and auditory perception at ages 3, 4, and 5 and reading ability at grades 1, 2, and 3.

2. Although the study will not overlook the usual demographic and static variables of home and classroom (e.g., family income, teacher's years of experience), we want to place extraordinary emphasis on process variables(e.g., teacher-child and parent-child interactions).

3. The criterion measures of the study will encompass both the objectives that preschool and primary programs claim for themselves and those aspects of development which society and social science theory hold as important in the broader area of human functioning.

4. To the extent possible, we shall get multiple sources of information about a phenomenon; e.g., from tests and from observations.

5. For many of the measurements, we shall give preference to unobtrusive and nonreactive measures; e.g., observations of behavior in natural settings.

6. Since descriptions of results should be handled at a level of discourse and conceptualization above the "item" level, every attempt will be made to develop and use psychologically and educationally meaningful "scales." Of course, throughout we want to use measures that meet acceptable professional standards in such areas as reliability and validity.

In passing, reference has been made to parent permission and school cooperation. In a study of this sort, concern with parent, teacher, school, and community relations is of far more than passing significance. It is crucial to whether the study ever gets started and, once started, gets done. In particular, many residents and teachers in poor or black communities are tired of the clipboarded researchers who cavalierly invade their lives, are suspicious of research completely planned and controlled by people outside the community and the culture, and are impatient with the lack of returns to the community.

We have to accept the notion that we <u>can</u> get past their reservations and conduct research in such areas--otherwise the study is not viable--but we feel we have a special obligation to make the research as <u>relevant</u> as possible. Some of our steps in this direction include provisions for getting advice on measurement content and procedures from people in the study communities; having people on the central project staff who have lived or worked in similar communities; pretesting our procedures in similar communities and with similar children, parents, and teachers; mounting an intensive public information program about the study in each area; "feeding back" relevant information to parents, school people, and others during the course of the study; and recruiting, training, and paying local personnel to carry out most of the operations required. (See Chapter B.)

To review--our general objective is to try to find out about the components of early education that are associated with the development of disadvantaged children. We feel that descriptions of effects should go beyond general or average trends. We want to know which particular program characteristics are best for which particular kinds of children. Furthermore, to provide information which will contribute to educational and social planning, theories of child development, and techniques of assessing young children and their environments, we hope the study will be able to

- find out how children's characteristics are related to home and community characteristics and what characteristics distinguish the Head Start child from the eligible child who does not go to Head Start;

- identify the characteristics of preschool and primary school programs in the study communities and how these are supportive of one another or are in conflict;

- not only determine the immediate effects of compensatory preschool programs but also study the permanence of any such effects through the primary grades;

- relate teacher characteristics to teacher behavior;

- obtain information about mobile versus nonmobile families;

- describe changes in the interrelationships and structure of children's abilities and characteristics over time; and

- develop new means of assessing children and their environments.

B. STRATEGY AND TACTICS IN CONDUCTING RESEARCH WITH THE DISADVANTAGED*

Joseph L. Boyd, Jr.

Different populations require different research approaches. It is clear that approaches that work in the suburban setting yield inadequate results when used in the black ghetto. To underline the need for matching techniques to populations and to spotlight a type of bias that is built into many of our measuring instruments, Adrian Dove, a sociologist working in the Watts area, prepared an "intelligence" test oriented toward the black lower class. The Dove Counterbalance Intelligence Test, or "Chittlin' Test" as it is better known, includes such items as:

> Cheap "chittlings" (not the kind you purchase at a frozen-food counter) will taste rubbery unless they are cooked long enough. How soon can you quit cooking them to eat and enjoy them? (a) 15 minutes (b) 2 hours (c) 24 hours (d) 1 week (on a low flame) (e) 1 hour
>
> A "handkerchief head" is _____. (a) a cool cat (b) a porter (c) an "Uncle Tom" (d) a hoddi (e) a "preacher"
>
> [(c) is the right answer in each item]

The content of the measuring instrument is, of course, only one consideration in the strategic needs to tailor research to the disadvantaged population. Strategic needs relate to the overall, long range success of the research. There are also tactical needs related to the day-by-day progression of data collection.

Poor strategies in the evaluation of educational programs for the disadvantaged came under fire recently in a symposium speech by Gordon (1968) who said, among other things:

> These investigators set about to crudely document the rapidly emerging programs and their impacts on children and youth.
>
> The principal focus of this evaluative research was placed on changes in cognitive development as reflected in scores on standardized tests of intelligence and academic achievement. A review of many

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*From a speech presented at the annual meeting of the New Jersey Association of School Psychologists, Atlantic City, November 8, 1968.

> of the reports emanating from these studies reveals negligible gains as reflected by these criteria, but almost always a subjectively determined greater gain in emotional-social development and stability.
>
> The narrowness of the output measures, typical of these first efforts, reflects a bias that has plagued educational evaluation. Although the goals of education tend to be stated in broad terms, when we come to assess education it is always to cognitive development and academic achievement that we first look for evidence of change. Too often we either stop with those first results or turn with less rigor to look at other areas either as a second thought or as a rationalization for our failure to find more impressive evidence in the cognitive domain.

He went on to discuss the strategy of research design (the recognition of the interaction between school, community, and family influences, and the developmental processes in children) and the designing of studies to explore much more than can be measured by a Stanford-Binet or a SCAT-STEP battery.

Much in educational research in the past, and at present, is based on strategic errors. In effect, we measure the easy-to-measure, easy-to-change elements and avoid or ignore the difficult-to-measure, difficult-to-change elements and influences in the development of children--disadvantaged and otherwise.

The term tactics, applied to research with the disadvantaged, refers to the way things really are. To quote a black psychologist from Philadelphia discussing research in the ghetto: "These times are potentially explosive in the black community. A complex subject, highly charged emotionally, mixed with countless fears and anxieties requires experts to handle the special problems imposed by black respondents" and "black community deeply concerned about being used like a 'goldfish bowl'--one wherein outsiders sneer at its life style..." Another community activist said, "We're sick and tired of graduate students with clipboards..."

Another expression of the ghetto attitude comes from Bennett (1968): "[Ghetto Negroes] are tired of being utilized and exploited by the institutions that have kept them suppressed so long." He gave two major reasons for this rejection of research: "the lack of any benefit to the people taking part...; and the fact that the people taking part had no control over what research was to be done, how it was to be done, and how the results were to be used and published....I cannot emphasize too strongly that we will have to meet both these objections if we expect to experiment in ghetto areas in the future...."

In other words, new tactics are necessary for us to be able to collect data effectively in the disadvantaged community. Where black subjects are involved, black data collectors are needed--on more than a token basis. There is a feeling of frustration when it appears that outsiders are the only ones qualified to give tests and conduct interviews. There are emerging demands that the community be actively involved on both sides of a study. Researchers have recently heard in the urban north and in the rural south, "You will get no usable information here if you don't do something for us, and the best thing would be to teach us some saleable skills."

Revised tactics emerge: design the data collection instruments so that they can be administered by poor, bright, but relatively uneducated people; then hire and train these people to collect the data. Another aspect of community involvement is feedback. Too often researchers storm through a community, promising masses of information and other benefits. When the dust dies down things are just as they always were. It is necessary to feed test results back to schools and to parents. For example, if physical examination results show need for remedial action, the research team should make use of community resources to get the health services needed. This is the kind of thing that cannot merely be reported to parents--it is a situation in which the researcher must actively intervene.

The strategy in the longitudinal study is to employ a wide range of measurement techniques, spanning the following areas: cognitive, perceptual, personal, social, physical, family, classroom, school, and community.

Tactically, we are in communication with leaders of the poor community in each of the study cities. Formal leaders, represented by community action agency officials, and leaders of established organizations were informed of the study at the time their city became a serious candidate as a study site. Other influential people, who do not occupy formal leadership positions, have also been consulted in each city. At the same time, cooperation and understanding of the study have been sought from school administrations and boards. Because of these considerations, we felt it to be of utmost importance that written intents to participate in the study be sent to ETS by both community agencies and local school boards.

We will place on our staff a full-time person from each of the target communities to work as a local coordinator. He --or she--will then select, hire, and train people from the community to serve such project roles as classroom observers and test administrators. Of course, these local people will be intensively trained by ETS and will be given technical support by our professional staff. The results of the tests and physical examinations will be handled as described and fed back to the communities as appropriate. Our data collection effort is cooperative--we give as well as take.

Thus, we think we have applied good strategy in our research design by looking at many more than the usual facets of child-environment interaction, and good tactics by working for involved acceptance in the study communities.

C. CHILDREN'S COGNITIVE AND PERCEPTUAL DEVELOPMENT

Background and Theory

Samuel Messick

Over half a century of empirical research on intellectual functioning has uncovered a vast array of dimensions spanning the cognitive arena from perception through memory, reasoning, and judgment to creative production. Although most of this research has been done with adult subjects, a great many distinct cognitive dimensions have also been demonstrated at earlier ages. In order to provide a guide for the representative selection of instruments for assessing cognition in young children, an attempt will be made to describe this conglomeration of empirical dimensions in an organized framework to serve as a map of the perceptual-cognitive-intellectual domain. In so doing, we will rely heavily not only upon variables derived from the literature on child development but also upon information about the structure of adult cognition.

The child development literature is a particularly important source for those variables that operate during a specific age period but do not appear in the same form at later ages, such as the dimensions of intuitive and concrete thinking uncovered by Piaget, and other variables which are age specific or are qualitatively transformed over time or, because generally mastered by everyone in later years, display too little variation to emerge in analyses of adult individual differences. We also emphasize dimensions of adult performance in the selection of cognitive measures for this longitudinal study of young children to ensure that appropriate variables are included to trace the emergence and evolution of dimensions relevant to effective adult functioning and to study the precursors of adult consistencies during these early years.

Models for Organizing the Cognitive Domain

Several types of models have been proposed as a basis for organizing the morass of empirical dimensions in the cognitive domain (Guilford, 1967). One is simply a dimensional model that represents the cognitive dimensions as a set of vectors in multidimensional space. Another is a hierarchical model that recognizes classes of dimensions and classes within classes, thereby taking into account the fact that some of the observed dimensions are fairly general and others quite specific, and that some are highly intercorrelated and others relatively independent. This type of model organizes the categories of dimensions very much like a tree, with broad dimensions representing limbs stemming from the trunk of a general dimension, with minor dimensions representing branches on the limbs, and still more specific dimensions twigs on the branches. A third type of model, called morphological (Zwicky, 1957), is a cross-classification of factors, a grid with intersecting categories rather than categories within categories as in the hierarchical model. A fourth type of

model, which might be called sequential, represents cognitive task performance as an interconnected series of events, sometimes involving feedback loops and dynamic integration over time, as in cybernetic and computer simulation models (Miller, Galanter, & Pribram, 1960; Reitman, 1965; Tomkins & Messick, 1963).

We shall begin our mapping of the cognitive domain with a description and extension of the morphological model of intellect proposed by Guilford (1959b, 1967). This model provides a cross-classification scheme for fairly specific cognitive dimensions that function at a relatively low level of generality. It primarily summarizes those dimensions derived over the years by Guilford and his co-workers in the Air Forces Aviation Psychology Research Program (Guilford & Lacey, 1947) and in the Aptitudes Research Project at the University of Southern California--although most of the dimensions derived by Thurstone and others can also be classified with varying degrees of confidence and arbitrariness. Some cognitive dimensions,however, such as induction and perceptual speed, appear to be too complex to fit unequivocally into one cell of the classification scheme, thereby suggesting the need for an extension of the system to handle broader, more complex higher-order factors that operate at higher levels of generality. Since such factors are subsumed naturally in a hierarchical model, Guilford's system will be generalized in the following treatment to a hierarchical formulation which, as Guttman (1958) has pointed out, is already implicit within it. In addition, many important cognitive functions, such as reading, speaking, conservation of quantity, or problem solving, are not only complex but are sequentially ordered and cannot be adequately represented merely by sorting their component processes into the appropriate combination of cells in Guilford's design. The model will, therefore, also be extended to include some provision for order of components, particularly order of complexity, so that we may discuss within the same overall framework those response dimensions that depend upon particular sequences of events or upon dimensions or hierarchies of mastery; e.g., where a complex performance requires the previous mastery of prerequisite or component processes (Gagné, 1965, 1968; Kofsky, 1966).

We thus propose to map the cognitive domain in terms of a set of dimensions arrayed in a cross-classification scheme. This map would be capable of being organized into a hierarchy of levels reflecting breadth of functioning and having provision for different orders of complexity. Finally, it would be capable of bringing together more complex processes in terms of sequences of component factors. The resultant map thus combines features of dimensional, hierarchical, morphological, and sequential models.

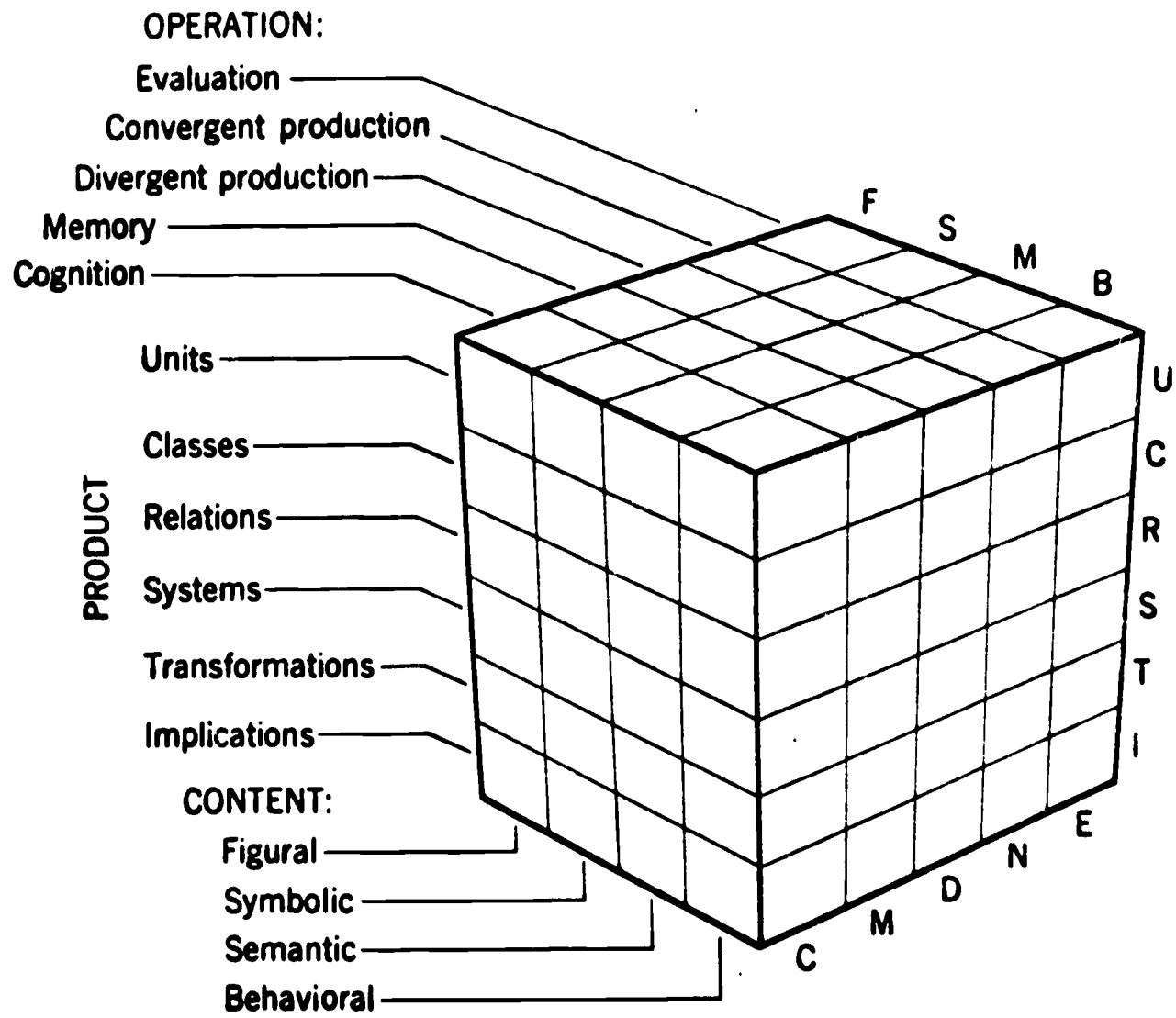
Guilford's Structure-of-Intellect Model

Guilford's theory for the structure of intellect (SI) is an operational-informational model that postulates five intellectual operations (cognition, memory, convergent production, divergent production, and evaluation) and 24 categories of information.*

*Guilford prefers to reserve the word "cognition" for the one operation that deals with awareness and comprehension; he uses "intelligence" to refer to all the information-processing operations together.

Figure C.1

GUILFORD'S STRUCTURE-OF-INTELLECT MODEL



The categories of information are further cross-classified in terms of four content categories or substantive areas of information (figural, symbolic, semantic, and behavioral) and six product categories or forms of differentiation (units, classes, relations, systems, transformations, and implications). The five operations, four contents, and six products provide a three-way cross-classification system yielding 120 cells (Figure C.1).

As Carroll (1968) has pointed out, another way of presenting the SI model is to state that any cognitive dimension can be uniquely described by selecting one term from each of the following three columns:

Cognition (C)	Figural (F)	Units (U)
Memory (M)	Symbolic (S)	Classes (C)
Convergent production (N)	Semantic (M)	Relations (R)
Divergent production (D)	Behavioral (B)	Systems (S)
Evaluation (E)		Transformations (T)
		Implications (I)

Thus, a vocabulary factor would be described as the cognition of semantic units (CMU). Although this form of presenting the model makes it seem like a Chinese dinner menu, it does provide a convenient means for adding facets to the basic design by merely adding columns to the menu, with the proviso that each cell be described conjointly by choosing one entry from each column. Definitions of the elements of the three facets of the SI model, as given in Guilford (1967) and Guilford and Hoepfner (1966), appear in Table C. 1.

Guilford's attempt to organize intellectual processes into a coherent system is in the mainstream of a long and honorable tradition in the history of thought. Plato recognized two kinds of abilities, sense and intellect; other writers later added memory, and still others, imagination or invention. Before the fall of the Roman Empire, speech and attention were often added for consideration, and finally movement (Spearman, 1927). Further increases in the list of faculties generally obtained by subdividing these seven; e.g., sensory ability split into visual, auditory, kinesthetic; intellect into conception, judgment, and reasoning.

By the early twentieth century, modern lists contained a wide assortment of purported dimensions conceptualized at various levels of generality and with varying degrees of overlap. To provide some logical organization for these listings, Spearman (1927) proposed a system of three fundamental processes (the awareness of one's own experiences, the eduction of relations, and the eduction of correlates), each of which could be subdivided in terms of "(a) the different classes or relations that are cognizable, (b) the different kinds of fundaments that enter into these relations, and (c) the varying kinds and degrees of complexity in which such relations and fundaments can be conjoined."

Table C.1

DEFINITIONS OF CATEGORIES IN THE SI MODEL

Operations

C - Cognition. Immediate discovery, awareness, rediscovery, or recognition of information in various forms; comprehension or understanding.

M - Memory. Retention or storage of information, with some degree of availability in the same form it was committed to storage and in response to the same cues in connection with which it was learned.

D - Divergent Production. Generation of information from given information, where the emphasis is upon variety and quantity of output from the same source. Likely to involve what has been called transfer. This operation is most clearly involved in aptitudes of creative potential.

N - Convergent Production. Generation of information from given information, where the emphasis is upon achieving unique or conventionally accepted best outcomes. It is likely the given (cue) information fully determines the response.

E - Evaluation. Reaching decisions or making judgments concerning criterion satisfaction (correctness, suitability, adequacy, desirability, etc.) of information. A process of comparing a product of information with known information according to logical criteria, such as identity, similarity, satisfaction of class membership, and consistency.

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F - Figural. Information in concrete form, as perceived or as recalled possibly in the form of images. The term "figural" minimally implies figure-ground perceptual organization. Visual spatial information is figural. Different sense modalities may be involved, e.g., visual, kinesthetic.

S - Symbolic. Information in the form of denotative signs, having no significance in and of themselves, such as letters, numbers, musical notations, codes, and words, when meanings and form are not considered.

M - Semantic. Information in the form of meanings to which words commonly become attached, hence most notable in verbal thinking and in verbal communication but not identical with words. Meaningful pictures also often convey semantic information.

B - Behavioral. Information, essentially non verbal, involved in human interactions where the attitudes, needs, desires, moods, intentions, perceptions, thoughts, etc., of other people and of ourselves are involved.

Products

U - Units. Relatively segregated or circumscribed items of information having "thing" character. May be close to Gestalt psychology's "figure on a ground."

C - Classes. Conceptions underlying sets of items of information grouped by virtue of their common properties.

R - Relations. Connections between items of information based upon variables or points of contact that apply to them. Relational connections are more meaningful and definable than implications.

S - Systems. Organized or structured aggregates of items of information; complexes of interrelated or interacting parts.

T - Transformations. Changes of various kinds (redefinition, shifts, or modification) of existing information or in its function.

I - Implications. Extrapolations of information, in the form of expectancies, predictions, known or suspected antecedents, concomitants, or consequences. The connection between the given information and that extrapolated is more general and less definable than a relational connection.

In addition to these qualitative distinctions, Spearman also proposed five quantitative "laws" to account for other sources of variability in test performance--span, retentivity, fatigue, conation, and primordial potencies (such as age, sex, heredity, and health). Some years later, El-Koussy* (1955), working primarily in the area of spatial abilities, suggested that every test can be thought of as having three main aspects--content (e.g., number words, figures, symbols, situations), form (e.g., classification, analogies, opposites), and function (e.g, deduction, induction, memory, visualization).

Guilford's conceptual analysis of some of the logical similarities and parallels among observed factors of intellect extends this venerable line of thinking to embrace a broader empirical array of dimensions, but a comparison of his model with earlier classification schemes suggests that still other elements might well be added, particularly in the sensory and response domains. A fourth facet could be added to the model, for instance, to represent sensory mode, with different levels on the facet referring to visual, auditory, kinesthetic, and other sensory processes. Indeed, the rudiments of this additional facet have already been included by Guilford (1967) in his attempt to classify visual, auditory, and kinesthetic candidates for the cell of the design corresponding to cognition of figural systems (CFS), as well as separate visual and auditory factors for the cognition of both figural and symbolic units (CFU and CSU). Additional facets may also prove necessary to account for consistent individual differences due to response mode and test form: a response facet would reflect variations in mode of responding, such as oral, graphic, or motoric (pointing, marking, or performing); and a form facet would reflect variations in administration and format, such as timed vs. untimed, individual vs. group, or multiple-choice vs. free response. Individual consistencies associated with such formal characteristics of a test are sometimes called method factors (Campbell & Fiske, 1959) or response sets (Messick, 1968b). They appear to reflect the operation of stylistic and personality variables in test performance and may be particularly important in the responses of young children (Damarin & Cattell, 1968; Jackson & Messick, 1958).

Regardless of the adequacy of Guilford's scheme as a theory of the structure of intellect, his classification system does provide an extensive integrated summary of known and potential factors of intellectual functioning and may thereby serve as a guide or check list for evaluating the adequacy of coverage of experimental test batteries designed to assess the cognitive domain. As a kind of periodic table of the mind, its unfilled cells also proffer prescriptions for test construction in as yet unexplored areas of intellectual performance.

Extension of the SI Model to Hierarchical Levels

Although many of the factors derived empirically in various laboratories can be classified into Guilford's scheme with varying

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*Referenced in Guttman (1958).

degrees of certainty, some of them, such as induction, appear to be too broad to fit into any single cell. By appearing to span several cells, these broad factors seem to represent more general levels of functioning, which in turn subsume several of the SI cells as special cases. Such a relationship suggests a system of categories within categories, such as represented in the major competitor to Guilford's theory--the hierarchical model of intellectual functioning.

Guilford's SI scheme is a logical model, in that it derives from a conceptual analysis of perceived similarities among factors. The hierarchical formulation, on the other hand, is touted as a psychological model derived from the quantitative analysis of empirical correlations among factors. One might expect particular versions of the hierarchical model to differ somewhat as a function of the specific empirical relations summarized, but the general tree-like framework would remain the same. Both Burt (1949) and Vernon (1950), for example, favor a hierarchical structure that places general intelligence (g) at the pinnacle with two major group factors immediately below. For Burt, these two broad group factors reflect logical thinking and aesthetic appreciation, both of which are thought to require the apprehension of abstract relations. For Vernon, the two major group factors derive from his attempts to integrate the results of several factor studies, wherein he observed that once the influence of g is removed, tests tend to fall into two main clusters--a verbal-numerical-educational type and a practical-mechanical-spatial-physical type. Below these broad group factors in both structures are found several minor group factors, and lower down still, various specific factors.

In Burt's model, four levels of factors are represented below general intelligence: The lowest level (sensation) corresponds to simple sensory processes and simple movements, as measured by tests of sensory thresholds and reaction time. The next level (perception) consists of more complex processes of perception and coordinated movement, including a dimension of perceptual discrimination regardless of sensory content. The third level (association) embraces memory and habit formation; it contains formal factors of memory and constructive imagination, as well as content factors of imagery (reproductive imagination), verbal abilities (including both receptive and productive factors for both isolated words and connected language), arithmetical abilities, and practical abilities (including spatial and mechanical factors). The fourth level (relation), the highest below g, refers to thought processes of both a logical and an aesthetic type. Burt also mentions certain general processes, such as speed and attention, that appear to affect mental functioning at every level. Although some of the lower-level dimensions in Burt's system, such as the receptive word factor, can be readily classified in Guilford's scheme (in this case as CMU), other dimensions, such as memory or constructive imagination (divergent thinking), appear to span several content and product categories.

Hierarchy Implicit in the SI Model

Several of the higher-level dimensions in hierarchical formulations, such as Burt's, sound as if they may correspond to higher-level dimensions implicit in Guilford's scheme. These implicit higher-order SI dimensions, which provide the basis for extending Guilford's system to include a hierarchy of levels, are revealed by treating the SI model as an "analysis-of-variance" design (Guttman, 1958). Since the SI model may be viewed as a 5 x 4 x 6 factorial (or facet) design, the dimensions corresponding to each cell may be considered to be a function of a general component plus three "main effects" (operations, contents, products), three second-order "interactions" (O x C, O x P, C x P), and one third-order interaction (O x C x P) unique to the dimension. Any of these main effects or interactions may be negligible in a particular case, of course. Thus, in addition to factors corresponding to its 120 cells, the SI model generates

- 74 types of implicit second-order factors (30 for combinations of the 5 operations x 6 products, 20 for combinations of 5 operations x 4 contents, and 24 for combinations of 6 products x 4 contents; e.g., factors reflecting skill in cognizing figural material regardless of type of product or skill in the divergent production of transformations regardless of type of content);
- 15 types of third-order factors (5 for operations, 4 for contents, and 6 for products; e.g., general memory facility regardless of form of content or type of product); and
- 1 fourth-order factor (general intellectual facility).

Empirical factors may occasionally turn up, of course, that appear to represent intermediate levels in the SI hierarchy, such as a single factor for cognition of figural and symbolic units separate from cognition of semantic units, or for a combination of cognition and convergent production of semantic relations. Although such complex factors may be mapped onto a combination of cells in the SI scheme, the mapping does not strictly follow the logic of the model. From the vantage point of the SI model, such factors are likely to have arisen because of inadequate coverage of the intellectual domain in the test battery in question, although they could be handled directly in a less logically constrained hierarchical system.

The logical nature of the higher-order dimensions in the SI model suggests that tests designed to assess them directly should be complex in nature--a measure of cognition of semantic materials, for example, should include six types of items to represent respectively semantic units, classes, relations, systems, transformations, and implications; while a general measure of divergent production should include 24 types of items, one for each of the product x content combinations. Thus, measures for a

particular facet element (like D__ or _F_), or for an intersection of elements (like CM_), could be produced by adding together appropriate items that systematically cover the remaining facets. Test homogeneity is thereby achieved for the higher-order dimension in question through what Humphreys (1962) has called the "control of heterogeneity."

Sample Classifications of Major Intellectual Dimensions

Primary mental abilities and other perceptual-cognitive factors. Thurstone (1938, 1944) and others have uncovered several dimensions of intellectual functioning over the years that can be classified more or less readily into the extended SI model (see French, Ekstrom, & Price, 1963). In the area of verbal ability, for instance, Verbal Comprehension appears to correspond to CMU, Word Fluency to DSU, and Ideational Fluency to DMU; Guilford's laboratory has added to the list Associational Fluency (DMR), Expressional Fluency (DMS), and a naming or labeling factor (NMU).

In the area of spatial skills, Spatial Orientation corresponds to CFS, Spatial Scanning to CFI, and Visualization to CFT. Thurstone's (1944) Speed of Closure factor represents CFU, and Flexibility of Closure, NFT.

In the area of memory, Associative Memory corresponds to MSR, and Memory Span to MSU or MSS.

In the area of reasoning, General Reasoning seems to correspond to CMS and Deduction to N_I (primarily measured as NSI and NMI). Induction, as assessed by Thurstone, appears to fit in CSS, but as a general construct it seems to refer not so much to the cognition of systems (or classes or relations) as to their convergent production--for convergent production includes not only logical deduction but also the drawing of compelling inferences from input information sufficient to determine a unique answer (Guilford, 1967).*

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*Induction is a mode of inference that goes from the particular to the general. Its operation implies abstraction, the process of selecting or isolating certain aspects of the specific information given as a basis for more general classification or treatment. When applied to a particular product of information, induction results in more general products of information; e.g., when applied to units, induction might yield classes, relations, systems, transformations, or implications; when applied to classes, it might yield more general classes or relations on classes or systems; etc. The inverse mode of inference, deduction, goes from the general to the particular and primarily refers to the derivation of implications from the information given. Induction and deduction are two ways of generating information from given information and as such are intrinsically involved in both convergent production and divergent production. In convergent production, the problem is structured with sufficient restrictions that only one appropriate product (or a small set) can be induced or deduced correctly, while in divergent production restrictions are more lax and stress is upon the number and variety of appropriate products that may be generated acceptably.

Number Facility, as might be expected, is related to both NSI and MSI, but since computational skills are highly practiced and overlearned, numerical operations tests also contain a large specific dimension not shared with nonnumerical measures of NSI. Such dimensions specific to particular subsets of operations within an SI cell would appear to represent a level of functioning still lower in the hierarchy (i.e., more specific) than the factors defined by the original SI model. Wide variations such as these in the specificity and generality of empirical factors are what led to hierarchical conceptions in the first place, and are just about what would be expected by a "transfer theory of abilities" (Ferguson, 1954,1956). This theory holds that for whatever cultural or environmental reasons, factors represent behaviors that happen to be learned together, along with those similar behaviors that become associated through transfer of training.

Cattell's dimensions of fluid and crystallized intelligence. Another major hierarchical theory of intellectual functioning has been proposed by Cattell (1943, 1963), who claims that there is not just a single g, but rather two higher-order general abilities, which he called "fluid" and "crystallized" intelligence. Fluid intelligence, which is said to have a substantial hereditary component, represents "processes of reasoning in the immediate situation in tasks requiring abstracting, concept formation and attainment, and the perception and eduction of relations" (Horn & Cattell, 1966). Crystallized intelligence, which is said to owe more to the individual's learning history than to his heredity, is the "capacity to perceive limited sets of relationships and to educe limited sets of correlates as a consequence of prior learning" (Damarin & Cattell, 1968). Cattell's theory is one of the few structural models of intelligence that makes explicit provision not only for the operation of fluid intelligence but also for motivation, capacity for immediate recall, transfer of training, and relevant personality traits in the determination of crystallized achievement (Cattell, 1963; Damarin & Cattell, 1968).

Two second-order factors identified as fluid and crystallized intelligence were obtained by Horn and Cattell (1966), along with other second-order dimensions for fluency, general visualization ability, and general speediness. The dimension of crystallized intelligence was marked primarily by Verbal Comprehension, Mechanical Knowledge, and other first-order cognitive factors, and as such it might possibly be interpreted as a higher-order cognitive dimension in the SI model (perhaps CM_ or C__). Fluid intelligence, on the other hand, was defined mainly by Induction and other reasoning primaries, thereby appearing to implicate in SI terms a higher-order convergent thinking factor. This level of interpretation is given modest support by the fact that the three other second-order intellectual dimensions obtained by Horn and Cattell (1966) also correspond fairly well to higher-order SI factors: The second-order fluency factor appears to represent DM_ or possibly a truncated D__; the general visualization factor corresponds to _F_ (virtually every task involving figural

content has a loading on the dimension); and the general speed factor, marked primarily by copying and matching tests, appears to involve general evaluation skills.

Extension of the Model to Include Sequences of Functions

Many complex cognitive skills, such as reading and problem solving, involve sequences of operations performed upon various categories of information, sometimes with later performance being contingent upon the prior mastery of earlier components. If such complex skills are to be systematically included in our mapping of the cognitive domain, some provision must be made for treating order of components, including order of complexity, within the general SI framework.

Orders of Complexity

When a complex performance requires the previous mastery of an ordered set of prerequisite or component processes, as in cumulative learning (Gagné, 1965, 1968) or developmental progressions (Peel, 1959; Wohlwill, 1960b),a dimension or hierarchy of mastery emerges that may be represented in the SI model by adding a facet for order of complexity. Order of complexity in this case refers to the increasing subsumption of simpler components into more complex ones: If t_1 is the least complex element on the facet, for example, t_2 would require everything t_1 does and more, t_3 would require everything t_2 does and more, etc.

Guttman (1958) has developed some quantitative techniques for analyzing relationships between variations in complexity and variations in test content. For tests of the same kind, variations in complexity lead to a structure that Guttman has called a simplex. For tests at a constant level of complexity, on the other hand, variations in kind of content lead to a structure called a circumplex. Variations in both complexity and kind lead to a structure known as a radex.

Orders of Sequence

Models of complex cognitive functioning should also provide some means of representing temporal sequences of processes, including feedback loops where applicable and dynamic integration over time, as in flow chart or computer simulation models (Tomkins & Messick, 1963). One prototype of such a sequential model is the cybernetic theory of behavior proposed by Miller, Galanter, and Pribram (1960), which adopts the feedback loop as its fundamental building block. This basic unit, which they have employed in the analysis of several psychological processes, is referred to in their terms as a TOTE sequence, which stands for Test-Operate-Test-Exit. This unit represents a sequence of operations in which a check is first made to ascertain whether or not a satisfactory state of affairs exists; if not, some operation is performed to rectify the situation, and a further check is made to determine the effectiveness of the operation. A satisfactory outcome would

terminate the pattern (Exit), which otherwise would ordinarily continue until an acceptable test was obtained (TOTOT...TE).

The "Test" function of Miller, Galanter, and Pribram appears to be very similar to Guilford's operation of evaluation, and what they refer to as "Operate" could include in the intellectual realm the other four operations in the SI system. The TOTE framework could thus be used to build up combinations of operations in sequence to represent various complex cognitive processes. A TOTOTOTOTE sequence alternating divergent production with evaluation, for example, would provide a summary representation of trial-and-error learning.

Complex Cognitive Processes As Sequences of Operations

Learning and concept attainment. Several studies have attempted to explore relationships between learning and various intellectual functions that may contribute to the learning process, perhaps differentially at different stages of practice (Allison, 1960; Duncanson, 1964; Fleishman, 1966; Stake, 1961). Bunderson (1967), for example, found that factors for three reasoning abilities as well as for visual speed related to scores on concept-attainment tasks differently at different stages of learning, suggesting that the learning process in this case might be composed of three component processes of problem analysis, search, and organization.

Dunham, Guilford, and Hoepfner (1968) recently studied three concept-learning tasks (one containing figural, one symbolic, and one semantic content) in relation to factors for the cognition, memory, divergent production, and convergent production of figural, symbolic, and semantic classes. They found that figural ability factors were implicated in the figural learning task, symbolic ability factors in the symbolic learning task, and semantic ability factors in the semantic learning task, and that cognition, divergent production, and convergent production of classes were differentially involved at different stages of learning and produced somewhat different patterns of relationship for the three types of tasks. There was some indication that facility in the cognition of classes is a handicap early in learning, but that it contributes more and more to success as learning progresses. The convergent production of classes tended to be more influential in the intermediate and later stages than in the beginning of learning, as did factors for the memory of classes. The divergent production of classes, on the other hand, was relatively important at the beginning of the semantic-concept task, but not until the later stages of the symbolic-concept task, possibly because the greater difficulty of the symbolic task led to a greater reliance in that case upon trial-and-error strategies.

It would seem, then, that performance on a particular learning task can be represented as a sequence of complex processes, undoubtedly including motivational and personality processes, and that the relative contribution of component intellectual operations (such as cognition or divergent production) varies as a function of the stage of learning and of the difficulty or complexity of the task. The nature of the particular component factors

involved also depends upon the content and form of the thing learned: Figural abilities seem likely to be implicated in learning tasks employing figural materials, for example, and the same kind of match would be expected for symbolic, semantic, and behavioral materials. Skill in dealing with classes appears to be relevant to concept attainment, as we have seen, but facility with other products ought to be emphasized in other forms of learning; e.g., relations and implications in paired-associate learning, systems in serial learning, and transformations in insight learning.

In regard to mapping the cognitive domain, then, learning tasks would be classified in terms of the content of the materials used and the product emphasized in the form of learning procedure employed; i.e., in terms of the category of information learned (the 24 C x P cells in the SI model). Thus, learning tasks may cover in a conglomerate fashion the same cells of the SI model already represented by specific ability measures, but scores from the learning task, particularly if derived separately for different stages of learning, would in addition reflect relative effectiveness in combining appropriate component skills for the achievement of a complex performance.

Similar conceptual analyses suggest that many other complex cognitive processes may also be represented in terms of sequences of SI operations and that consistent individual differences may appear as a function of the category of information processed in each case (Guilford, 1967). With respect to mapping the cognitive domain, then, assessment tasks for such processes should be classified in terms of the content x product aspects of the materials and procedures used.

Perception and attention. Since distinctions between "perception" and "cognition" are difficult to draw in absolute terms, most psychologists usually just admit that a blurred area of overlap exists. Consider, for example, that in the tachistoscopic presentation of words at gradually increasing exposure times, information might be extracted from the stimulus materials in stages: During the earlier brief exposures, a subject might identify only single letters and not realize until later exposures that the combination of letters perceived forms some word, whose meaning would not be comprehended until still later exposures. In Guilford's terminology, these stages of information extraction proceed from the cognition of figural units through the cognition of symbolic units to the cognition of semantic units, all of which fall properly within the domain of cognition. Guilford is willing to follow traditional usage, however, and label the cognition of form as perception, but he feels that the awareness of semantic meaning and even the realization that a form is a sign for something else would technically fall beyond the perceptual area. For Guilford (1967), then, "perception may be said to overlap cognition where figural information is concerned".*

*It should be emphasized in this context that it is not the content of the test materials that is classified in the SI model but the content of the information processed. One subject, for example, might respond to the presentation of a Chinese character as if it were a figure, another as if it were a symbol, and a third in

Perceptual abilities, such as figure-ground separation, discrimination, analysis, and synthesis, appear to be roughly ordered in levels of complexity, in the sense that analysis and synthesis seem to require the prior mastery of discrimination, which in turn presupposes figure-ground separation, etc. Because of this, one might expect these skills to be developmentally ordered, with the more complex functions developing at later ages than the simpler ones (Birch & Lefford, 1963, 1967). As we shall see in a later section, such developmental orderings should also be expected for other intellectual abilities as well, primarily because certain products of information are intrinsically more complicated than others and thereby imply more complex processing skills; e.g., systems, as complexes of related or interacting parts, presuppose facility with relations, and classes, as groupings of elements, presuppose facility with units.

In SI terms, tests of figure-ground separation assess the cognition of figural units (CFU). Tests of form discrimination assess primarily the evaluation of figural units (EFU), the criterion of evaluation being identity, but variance in CFU may also be reflected to a greater or lesser degree depending upon the level of prior mastery attained by the subjects tested. If the form discrimination task involves identification after some kind of transformation, such as rotation, then CFT would become a major component in performance. Form analysis, in the sense of locating in a whole figure certain isolated pieces of the figure, involves not only the cognition of figural transformations (CFT) but their convergent production (NFT) as well, with the latter function becoming more and more salient as the figures become more complicated. Form analysis of this type might therefore be a precursor of embedded-figures performance, since the dominant function in that task is also NFT (Guilford, 1967). Form analysis is said to involve a transformation, in this case a revised interpretation or use of lines, because the locating of a piece within a whole requires that lines first seen as part of the larger figure must come to be reinterpreted as part of the piece. On the other hand, form synthesis (in the sense of choosing a set of parts that may be combined to construct a standard figure) would reflect the convergent production, and possibly the cognition, of figural systems (NFS and CFS).

One of the most critical problems in the area of perception is to account for why subjects do not perceive everything in the stimulus field all the time. This problem is usually handled by introducing the concept of attention, which implies some kind of filtering operation underlying the observed selectivity in

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terms of its meaning. Although we usually presume that test contents will be interpreted in the intended standard way and proceed to treat the test as a measure of X, these presumptions should be examined empirically in the light of obtained response consistencies across tests (factor patterns) and other means of inferring the respondent's subjective treatment of the materials. This point is very similar to the old caveat that tests do not have reliabilities or validities, only test responses do--and these vary as a function of subject characteristics.

perception (Broadbent, 1957, 1958). In addition to the notion of selectivity, however, the concept of attention usually also involves the notion of level or intensity of involvement, in terms of degree of vigilance or arousal. Since variations in level of attention occur as a function of stimulus presentation or change and so do systematic variations in muscular, electrocortical, and autonomic responses, individual differences in the strength and habituation of these bodily responses (which together are called the orientation reaction) have come to serve as indices of attentional variables (Lynn, 1966). Thus, components of the orientation reaction, including such straightforward measures as fixation time, provide reasonably objective indices of the intensity and amount of attention even for very young children (Kagan & Lewis, 1965).

In addition to questions of how much is perceived (selecivity), for how long (duration), and with what degree of vividness (intensity), there is also the question of what is perceived--i.e., the question of the direction of attention. When we consider this latter issue, it becomes clear that the direction of attention is a function not only of characteristics of the stimuli but of characteristics of the perceiver. It is influenced by individual styles of scanning the environment and is determined to a considerable degree by the intentions and desires of the subject. This is not just the point that the S-R paradigm must be modified to include organismic variables as mediators (S-O-R), but that the organism actively selects and structures his stimulus field as a function of his needs and motives (O-S-R) Thurstone, 1923; Solley & Murphy, 1960).

Attentional variables thus appear to fall as much in the personality domain as in the cognitive and will be treated here as part of a separate category of variables, called controlling mechanisms, that cut across the relatively arbitrary distinctions between cognitive and personal-social functioning. Controlling mechanisms, which include stylistic and strategic determinants of behavior, thus offer a basis for articulating cognitive,personal-social, and affective domains as interrelated subsystems of the total personality organization (Gardner, Jackson, & Messick, 1960; Messick, 1961). These controlling mechanisms will be discussed in later sections.

With respect to the SI map of the cognitive domain, then, attentional variables would be expected to play some role in all cells and at all levels. As previously noted by Burt (1949), attentional processes are general and influence mental functioning at every level of the hierarchy. Other authors have emphasized the role of attention in complex mental processes such as learning, and some have even claimed that attention is the major determinant of performance. Zeaman and House (1967), for example, have argued that individual differences in discrimination learning, even those between retardates and normals are not due to individual differences in acquisition rate but to differences in attention.

Memory and recall. The dimensions of memory categorized in cells of the SI model deal with the retention and retrieval of

information in the same form in which it was learned and in response to the same cues in connection with which it was committed to storage. This type of retrieval has been called "replicative recall" by Guilford (1967). Within this paradigm, different dimensions of memory have been distinguished empirically in terms of the different kinds of products of information recalled. This suggests that memory storage may occur in a variety of forms, at least six according to the SI model, rather than in a single form, such as S-R connections. This possibility, which would emphasize classes and systems as well as relations and implications, offers a basis for encompassing notions of association along with notions of schema and structure within a common framework.

In addition to replicative recall, Guilford (1967) also distinguishes a type of retrieval he calls "transfer recall," in which information is retrieved from memory in response to cues not directly involved in the original learning. This type of memory retrieval is particularly relevant to divergent production, where the cues for recall are usually fairly general and cut across previous learnings and where sometimes, as in the divergent production of systems*, the particular elements retrieved have never even existed in combination before, let alone in connection with specific cues. In transfer recall, it is as if the subject scans his memory in search of patterns or products of information that will match in a sufficient number of points a desired pattern defined by the given cues. It is as if the desired pattern serves as a template guiding the scanning activity, just like Duncker's (1945) "search model," with those products ultimately retrieved from memory being the ones found to match the model acceptably. The question of an acceptable match, of course, brings into play the operation of evaluation. Thus, the process of recall appears to involve a complex sequence of operations that includes divergent production and evaluation as well as the various "replicative" dimensions of memory per se.

Problem solving and creativity. Several conceptual analyses of the problem-solving process and of the creative process have resulted in similar lists of operations occurring in sequence. Dewey (1910), for example, proposed five steps in the problem-solving process: (1) a difficulty is felt; (2) the difficulty is located and defined; (3) possible solutions are generated; (4) consequences are considered; and (5) a solution is accepted. Wallas (1926) proposed four steps for the creative process: (1) preparation, or the gathering of information; (2) incubation, or unconscious manipulation; (3) illumination, or the emergence of solutions; and (4) verification, or the testing of solutions. The final step in both series appears to correspond to the SI operation of evaluation, as does the initial step in Dewey's list, thereby suggesting that the general TOTE formulation of Miller, Galanter, and Pribram(1960) may be applicable here. With the exception of incubation, the remaining steps in both lists appear to involve cognition and a blending of divergent production and convergent production. Wallas's stage of incubation provides

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*For example, write as many four word sentences as you can where the first word begins with W, the second with C, the third with E, and the fourth with N.

a puzzle, however, since there is little evidence about the nature of the unconscious operations that might be involved. Guilford (1967) has suggested that incubation involves transformations of information resulting from motivationally induced interactions among stored products of information in memory.

Guilford (1967) has also proposed a sequential model of problem solving but in the form of a flow chart, rather than a list, to permit multiple feedback options. The model emphasizes the role of cognition in structuring the problem and in obtaining information from the environment and from memory and the role of production, both divergent and convergent, in generating answers. The operation of evaluation occurs repeatedly throughout the sequence. An important feature of the model is that provision is incorporated for the transmission of information from memory to the central operations of cognition and production not only through the filter of evaluation but also directly, as would be the case in the suspended judgment technique in brainstorming.

These analyses of the problem solving and creative processes as sequences of component operations are descriptive of general features rather than being predictive of specific outcomes, and as such their major value is heuristic. These models emphasize both the distinctiveness of the component processes and the sequential nature of their combination in achieving the final solutions or creative products. This suggests, on the one hand, that the various component skills should be assessed separately in order to diagnose specific proficiencies and, on the other hand, that overall aspects of the total process (and possibly its major phases) should be assessed directly to gauge relative effectiveness in combining the appropriate components in task performance.

In considering component skills in creativity and problem solving, special attention should be given to the dimensions of divergent production, for they provide the basis for the essential function of generating possibilities. These dimensions include fluency of various types, such as figural (DFU), symbolic (DSU), ideational (DMU), associational (DMR), and expressional (DMS); flexibility, in the sense of producing varied classes of responses (e.g., DMC,"spontaneous flexibility") or producing transformations (e.g., DFT, "adaptive flexibility"); originality, in the sense of producing unusual, remote, or clever responses (DMT); and elaboration, or the divergent production of implications (D_I, especially DMI, semantic elaboration). As has been noted, dimensions of evaluation also play a critical role in problem solving and creativity, and dimensions of cognition and convergent production are frequently required as well. Among the latter dimensions of particular relevance to problem solving are sensitivity to problems, or the cognition of semantic implication (CMI), and redefinition, or the convergent production of semantic transformations (NMT).

In the measurement of creativity, one common approach is to assess these various component dimensions directly as a means of tapping personal qualities that might be predisposing toward creative performance. Another approach, which could be used

jointly with the first, is to evaluate actual products for the extent to which they exhibit properties usually considered to be creative. The products might be evaluated in terms of their relative unusualness, for example, or their degree of appropriateness or fit, both internally among the parts and externally with the context. They might be judged for the extent to which they embody transformations that transcend immediate constraints or the extent to which they summarize the essence of the matter in sufficiently condensed form to warrant repeated examination (Jackson & Messick, 1965). The application of such criteria conjointly would make it possible to distinguish degrees of quality within the class of creative products--once the necessary requirements have been met for considering a product creative in the first place. In this connection, it is generally agreed that the minimal properties required for a product to be called "creative" are unusualness and appropriateness, with the latter being included primarily to rule out the bizarre and absurd (Barron, 1963; Jackson & Messick, 1965; Wallach & Kogan, 1965). This suggests that a good starting point for the assessment of creative tendencies would be measures of originality and evaluation, both of which could be derived from tasks requiring fluency in the production of uncommon (though appropriate) responses.*

Comparisons with Other Summaries of Cognition

Some feeling for the adequacy of coverage provided by the extended SI system as a map of the cognitive domain may be obtained by a brief comparison of the system with other integrative summaries of cognition. One of the most extensive of these summaries is the treatise on Children's Thinking by David Russell (1956), which distinguishes six major types of thinking: perceptual thinking, associative thinking, inductive-deductive thinking leading to concept formation or conclusion, problem solving, creative thinking, and critical thinking. As described by Russell, these six types of thinking are relatively complex processes, but in four of the six cases a particular component appears to be comparatively central. In perceptual thinking the major process seems to be cognition; in associative thinking the central feature is memory, particularly memory for implications and relations; in inductive-deductive thinking the dominant process is convergent production; and in critical thinking--which involves discrimination, comparison, and appraisal--it is evaluation. Both creative thinking and problem solving involve a combination of important components, but the role of divergent production is prominent in each. Thus, there is a remarkable match between the types of thinking described by Russell (1956) and the five operations of the SI model. The distinctions made by Guilford (1967) among the various contents and products of information processed are not similarly matched by Russell, however, who treats the materials of thinking more globally in terms of percepts, images, memories, and concepts--although Russell does

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*As will be seen in the section on The Measurement of Creativity, it is sometimes possible to derive several scores from the same task to represent different dimensions of creativity, such as number of common responses (ideational fluency), the number of uncommon responses (originality), the number of classes of response (flexibility), and the number of inappropriate responses (evaluation).

consider subtypes of materials in terms of specific contents, such as percepts of space and concepts of the self, some of which could be translated into SI categories.

In another major integrative summary of cognition, Kagan and Kogan (1968) chose to structure their discussion of individual variation in cognitive processes under headings corresponding to components of the problem-solving process, which in their terms included encoding, memory, generation of hypotheses, evaluation, and deduction. Again there is a remarkable similarity between these constructs and the five operations of the SI model --memory and evaluation are represented in both schemes; encoding corresponds to cognition (with the additional operation of attentional variables); generation of hypotheses corresponds to divergent production; and deduction corresponds to convergent production. And again, consistencies in response related to different contents and products of information are not systematically treated in the Kagan and Kogan review.

It would appear, then, that the coverage of the cognitive domain provided by the extended SI system is quite comparable to that of other summaries with respect to the types of psychological operations considered. It is generally more extensive and detailed than other treatments, however, with respect to the content and form of the information involved in those operations. These latter distinctions of content and form are far from trivial, for they derive not from subjective analyses of types of "knowledge", as in epistemology, but from empirical analyses of individual differences in performance, which could provide the basis for a kind of psychoepistemology (Guilford, 1967). Thus, the 24 categories of information in the content x product classification scheme not only provide a taxonomy of all the things that can be cognized, remembered, produced, and evaluated, but also a taxonomy of empirical dimensions of individual differences in information processing. Distinctions among various types of content and form were incorporated in the SI model, then, because it was found to make a difference at the level of individual performance whether one was dealing with classes or systems, for example, or whether the content was figural or semantic. Functional relationships observed to hold for one kind of content did not necessarily hold for another, and the same was true for different types of products.

In this connection, special attention should be given to the distinction between behavioral information and other types of content. Behavioral content includes information involved in social interactions, where the attitudes, needs, desires, moods, feelings, intentions, perceptions, thoughts, and actions of other persons and the self are important. This separating out of behavioral information as a distinct type provides a basis for handling within the SI framework the repeated finding that processes of perception, memory, learning, and reasoning tend to have different properties and correlates when social or affective materials are involved, presumably because of the implication of personality dimensions and controlling mechanisms (Fitzgibbons, Goldberger, & Eagle, 1965; Messick & Damarin, 1964; Rosenhan & Messick, 1966; Thistlethwaite, 1950).

The inclusion of behavioral content in the SI model incorporates what Thorndike (1920) called "social intelligence" into the system and furnishes an ability framework for dealing with the cognitive aspects of such problem areas as person perception, social sensitivity, and self-appraisal. The behavioral abilities hypothesized by the SI model in some cases seem to be counterparts of constructs already utilized in these areas, such as "forming impressions from fragmentary cues" (CBU) or "penetrating the defenses of another person" (NBT), but in other cases the SI distinctions appear to offer new perspectives. Thus, the notion of behavioral abilities as dimensions of social information processing affords a much needed additional basis for theoretical analysis and measurement in the particularly complicated area of social cognition (e.g., see Bieri, Atkins, Briar, Leaman, Miller, & Tripodi, 1966; Bronfenbrenner, Harding, & Gailwey, 1958; Diggory, 1966; Jackson & Messick, 1963; Sarbin, Taft, & Bailey, 1960; Schroder, Driver, & Streufert, 1967; Taft, 1956; Tagiuri, 1969).

In short, the extended SI system provides a broad integrated summary of known and potential dimensions of cognitive functioning. As such, it offers a guide or check list for evaluating adequacy of coverage in studies designed to assay the cognitive domain. These guidelines emphasize the importance not only of measuring a representative set of specific dimensions, but also of assessing the relative effectiveness of their combination in complex sequential processes such as reading or problem solving. The hierarchical features of the model serve to sensitize the investigator to questions of generalizability and point to the major kinds of response consistency that would be required for the utilization of constructs having higher levels of generality, such as consistencies across different types of content or product or operation or across various combinations of these facets (i.e., factors that span several SI cells). Before these guidelines are applied in terms of specific measurement strategies, however, two major topics remain to be treated which have implications at the measurement level--one deals with the interdependence of the cognitive domain and other subsystems of the total personality and the other deals with developmental changes in cognition.

Personality Organization in Cognition

The ability dimensions encompassed in the SI model essentially refer to the content of cognition or the question of "What?"--what kind of information is being processed by what operation in what form? We must also be concerned, however, with the style of cognition or the question of "How?", i.e., the manner in which the behavior occurs, for stylistic consistencies frequently interact with content factors to influence the achievement level of performance. For this reason it is important to assess the style of response to cognitive demands as well as the content of the response, for it is dangerous to make inferences about capacity from the achievement level of performance alone (Hertzig, Birch, Thomas, & Mendez, 1968). The concept of ability implies the measurement of capacities in terms of maximal performance, whereas the concept of style implies the measurement of preferred modes of operation in

terms of typical performance, but both are necessary for a full understanding of cognitive functioning (Cronbach, 1960). Stylistic aspects of cognition reflect personality dimensions that cut across affective, personal-social, and cognitive domains and thereby serve to interlace the cognitive system with other subsystems of personality organization (Gardner, Holzman, Klein, Linton, & Spence, 1959). The personality dimensions of primary interest in this connection are referred to as controlling mechanisms.

Cognitive System Variables

Some of the controlling mechanisms represent dimensions of individual differences in the structural characteristics of the cognitive system itself, or more broadly of the total personality system. These dimensions primarily reflect differences in the complexity of the system and derive a large part from the thinking of Lewin (1935, 1951) and Werner (1957a). Both of these theorists emphasized concepts of differentiation, articulation, and hierarchic integration in development, with Lewin in particular stressing the importance of developmental increases in the variety of units and in the independence of the parts. Several measures of individual differences in cognitive complexity have stemmed from these notions in recent years, thereby mirroring an increasing concern over system properties as controlling influences in behavior. These measures include such things as the number of different dimensions or constructs utilized by subjects in judging similarities and differences among people (Kelly, 1955; Bieri, 1961); the degree of gradation or articulation within each of these dimensions (Bieri et al, 1966; Messick & Kogan, 1966; Signell, 1966); the diversity of content exhibited in the concepts generated (Signell, 1966); the number of different groups used in sorting common objects (Gardner & Schoen, 1962; Messick & Kogan, 1963); and the abstractness vs. concreteness of conceptual systems (Harvey, Hunt, & Schroder, 1961; Schroder, Driver, & Streufert, 1967). Related concepts of psychological differentiation are also stressed in the work of Witkin et al (1962) and of Rokeach (1960).

Cognitive Styles

Other controlling mechanisms appear in the form of crystallized preferences or information-processing habits, called cognitive styles, which determine a person's typical modes of perceiving, remembering, thinking, and problem solving. As habits of information processing, it is not surprising that different dimensions of cognitive style have come to be associated with particular information-processing operations--e.g., scanning with perception, leveling-sharpening with memory, conceptual style and category breadth with divergent production, field independence with convergent production, and impulsivity-reflectivity with evaluation--but this association is far from perfect and many of the styles appear to influence information processing sequences at several points.

Other controlling mechanisms are listed in section D on personal-social development, and the relation of cognitive styles and system variables to child training and maternal behavior is discussed in section F on the measurement of family characteristics.

Developmental Changes in Cognition

We now turn to a consideration of the structure of the cognitive domain in childhood and the question of how far down the age scale the extended SI system might apply.

The Factorial Differentiation Hypothesis

In contrast to the notion that the major ability factors observed in adulthood may exist in rudimentary form fairly early in life is the hypothesis proposed by Garrett (1946) that a single general ability dimension is dominant in early childhood, which then differentiates in time into a few broad ability factors and later into more and more specific abilities. Guilford (1967) systematically reviewed the available evidence for and against the Garrett hypothesis and found the majority of the results to be nonsupporting. Some of the most critical evidence involved the repeated finding of differentiated abilities in very young children (ranging down to ages two and three), including the differentiation of such factors as CMU and CMS or NMU and NMS which differed in only one facet of the SI design (Hurst, 1960; Meyers, Dingman, Orpet, Sitkei, & Watts, 1964; Meyers, Orpet, Atwell, & Dingman, 1962; McCartin & Meyers, 1966). Several cognitive dimensions were also uncovered in analyses of infants and preschool children by Stott and Ball (1965), using items drawn from various standard infant and preschool scales. These investigators attempted to identify the obtained factors with SI categories, and among the 31 intellectual dimensions isolated were represented all five of the operations, as well as all four contents and five of the six products.

Such evidence suggests that at least some dimensions reflecting the major distinctions of the SI model may emerge fairly early in life. Indeed, Guilford (1967) goes so far as to suggest that the five types of operations are inherited, that "the brain is apparently predesigned to perform in the five major ways, and it may also be predesigned to handle information in the form of the different kinds of products." He thinks it more probable, though, that uniformities in the child's environment, as processed by the innate operations, are primarily responsible for the different kinds of products formed as well as for the different types of content experienced. This would suggest that certain dimensions in the SI model would be expected to develop earlier than others, because of the differential salience of particular kinds of experience early in life. The child's first experiences, for example are probably in the form of behavioral information having reference to his own internal states, followed closely by figural information as he responds to visual and auditory inputs, then by semantic information, and finally by symbolic information. Intuitively, it also seems likely that dimensions involving certain products of information ought to develop earlier than others, such as skill in processing units before skill with classes or facility with relations before facility with systems, mainly because some products appear to be intrinsically more complex than others.

These notions fit very well with the accommodation aspects of Piaget's theory (Flavell, 1963), and some of the concepts of one formulation appear to be readily translatable into the terms of the other. The sensorimotor schema of Piaget, for example, seems to

correspond to a behavioral system, which developed first from behavioral units that have come to form a class of action sequences. By and large, then, the specific Garrett (1946) hypothesis of a single general ability that differentiates over time finds little empirical support, but the more general notion that cognitive structure tends to become increasingly more differentiated (and hierarchically integrated) during the course of development, as propounded by Werner and Lewis, appears to be viable in factor analytic terms.

Stages of Development

Up to now we have been mainly concerned with the issue of developmental continuity vs. discontinuity in cognitive structure as viewed in terms of differential psychology, where discontinuity would be indicated by changes in the number or size of dimensions over time or by changes in the meaning of dimensions, as revealed in new patterns of correlates or factor loadings (Emmerich, 1964, 1968). There is also the possibility, however, that individuals pass through a developmental sequence of qualitatively different structural organizations, usually held to be in an invariant order, which is the more classical developmental view of stage progression. Several theorists have postulated such a developmental sequence of stages, usually involving three major phases that encompass similar phenomena from theory to theory but are labeled in somewhat different terms--such as sensorimotor, perceptual, and conceptual (Werner, 1957b); enactive, ikonic, and symbolic (Bruner, Olver, & Greenfield, 1966); perceptual, imaginal, and conceptual (Thurstone, 1926); or sensorimotor, preoperational, and operational (Piaget, 1950).

Under these circumstances a different approach to measurement must be added to our armamentarium--one that focuses upon a child's stage or level on the developmental scale. The emphasis here would be upon the assessment of qualitative features that are characteristic of particular stages of cognitive functioning and upon ordered sequences of tasks capable of gauging the transition from one stage to another. Individual differences within stage can also be assessed with these tasks. Although such measures could be classified in terms of SI categories, they are not primarily intended to assess specific dimensions of cognitive functioning. Such a classification--particularly as it reflects upon representativeness of coverage in terms of content, form, and operation--may prove to be of some relevance to stage measurement, however, because of the possibility that an individual may function at different developmental levels in different cognitive areas, as in Werner's concept of mobility of developmental level and Piaget's concept of horizontal decalage. Further discussion of approaches to measurement within the context of developmental stages appear in the section on "Measurement Related to Theories of Piaget."

Interactions with Environmental Variables

Many theorists, including Piaget and Guilford, emphasize the importance of interactions with the environment for intellectual development. Although the child may start with certain innate mechanisms, such as the predispositions underlying Guilford's five operations or Piaget's invariant functions of assimilation and

accommodation, the rate of progression and the variety of content in cognitive functioning appear to depend upon the extent to which these mechanisms are exercised in interaction with a varied environment (Hunt, 1961). Indeed, Ferguson (1954, 1956) has suggested that cognitive factors themselves represent domains of behavior that happen to have been learned together, along with those similar behaviors that become associated through generalization of learning and transfer. Some of the determinants of these shared learnings are developmental, in the sense that certain things are experienced together because they are appropriate to particular ages, but most of the determinants appear to be more directly sociocultural (Lesser, Fifer, & Clark, 1965).

One of the things you would expect from such a transfer theory of abilities is that factor structures would be more clearly defined for subjects having had the benefit of more experience, and this was indeed the case in a study comparing high and low socioeconomic groups (Mitchell, 1956). Direct evidence bearing on the transfer theory of ability development is sparse, however, because most of the training efforts studied have been limited and short term. What is clearly needed are "longitudinal studies in which the achievements of people with different experiences are compared" (Carroll, 1968).

Measurement of Perception

George Gordon, Irwin Hyman, and Martha Friendly

Rationale. Many elements of primary school programs are designed around the assumption that if one cannot differentiate the physical properties of one stimulus from another, then one cannot, with any degree of consistency, learn to employ that stimulus as part of a symbolic system. This is not to say that the discrimination skills in question bear a continuous linear relationship to complex intellectual skills. Rather, it is hypothesized that children who lack certain of these skills, whether through a developmental "lag" or through physical pathology, cannot benefit much from most normal learning experiences. However, above a basic perceptual threshold, no relationship is hypothesized between perceptual skill and educational development. Thus, while research on early education must encompass complex measures of intellectual and educational functioning, it might be equally important to obtain baseline measures on some of the relatively primary sensory and motor functions.

Many of the complex measures that will be obtained in the study will be based upon familiarity with standard English, as well as familiarity with many aspects of middle class environment. Since it has been well documented that the economically, disadvantaged child may lack these familiarities, it will be the goal of this task force to measure some of the skills involved in the development of the ability to read and write through means which are less directly related to these experiential factors.

Also, since the activities in the perceptual area are closely related to those in the physical area, there will be an attempt to identify those children who may be suffering some type of impairment to the central nervous system. Pasamanick, Knobloch, and their associates in a series of articles (Knobloch & Pasamanick, 1960; Knobloch, Rider, Harper, & Pasamanick, 1956; Pasamanick & Knobloch, 1958) have documented the relationship between the presence of complications of pregnancy and socio-economic status, with a higher incidence of complications among low SES groups. These studies further document the relationship between complications during pregnancy and a variety of neurological and psychiatric disorders, as well as severe reading difficulties in the offspring (Kawi & Pasamanick, 1959). Thus, one might expect that in a study within an almost exclusively low SES population, the proportion of children with neurological disorders will be substantially higher than in the general population.

While these studies lead us to expect a significant incidence of disorders, the question of specifying the exact nature of these disorders and their educational ramifications is still one which is quite open. Numerous authors have discussed approaches to diagnosing neurological impairment through cognitive, perceptual, and perceptual-motor tasks as well as neurological examination. For a variety of possible approaches to this

problem, see Clements & Peters, 1962; Halstead, 1941; Johnson & Myklebust, 1967; Kephart, 1960; Koppitz, 1964; Luria, 1966; Reed, Reitan, & Klve, 1965; Strauss & Lehtinen, 1947. However, while the principles discussed by these authors are applicable, few such measures have been designed for children of preschool age. A particular difficulty is that qualities which may have diagnostic significance at older ages are not sufficiently mature at these ages to have such significance. Thus, in this study, to a large extent, the actual score levels on specific instruments (singly or in combination) which might be indicative of some abnormality will be developed on the sample and modified in light of information obtained as the child matures.

It should be noted that the present investigators do not take the position that poor performance on perceptual tests is necessarily neurologically based. However, in light of the work relating performance on perceptual measures to brain damage on one hand and educational development on the other, it is deemed important to identify and study groups of low scoring children whether or not the causal factors are neurological.

Basically, three types of diagnostic approaches will be taken. The first will be the separation of those children who are suffering from obvious central or peripheral nervous system damage. This would include children who are for example, blind, deaf, or spastic. In addition, those children who have such other gross physical abnormalities as to preclude their being enrolled in a normal school program will also be separated out of the main sample. These children will not be included in the regular testing program.

The other two diagnostic approaches will attempt to identify children who might eventually be diagnosed as having a "psychoneurological learning disability" (Johnson & Myklebust, 1967). Data for these approaches will be available from a variety of sources, including:

1. Neurological examination
2. Medical history
3. Tests which have been related to brain damage, such as form analysis, form synthesis, and form reproduction
4. Observations of behavior during testing (see Koppitz, 1964, p. 87)
5. Observations in the classroom on activity level

One way of utilizing these sources of data to diagnose "impairment" will be to form an index based on the number of positive symptoms a child manifests. Thus, such indicators as traumatic birth, positive neurological signs, low scores on perceptual-motor tasks and reports of hyperactivity would place a child in the "impaired" rather than the normal category. Such an approach is reported by Halstead (1941) and used by others (Wheeler, Burke, & Reitan, 1963; Wheeler & Reitan, 1963) as a variable in more complex analyses.

These latter studies suggest a conceptual basis for the third type of diagnostic approach. This would be to classify children into categories according to the similarity of their score profiles on all the measures indicated above. The objective here would be to identify one large "normal" group and number of other smaller groups which have various patterns of poor performance. To the extent the measures were actually tapping different aspects of neurological functioning these groups would reflect differential impairment of these functions. This approach then does not search for a unidimensional diagnosis of "brain damage," but different constellations of symptomology which might be reflective of different types of malfunctions.

The objectives of identifying these subgroups will be twofold. The first will be to remove these individuals from larger analyses which postulate normal development, since it is suspected that these children may not develop normally. The second is to trace these groups separately to investigate the efficacy of certain program characteristics on their development.

Background. While perception is one of the first topics to be investigated by psychologists, there still exists no overall integrating theory which could directly guide the selection of appropriate measures in this field. Indeed, in approaching the current literature on perception, one finds two very different lines of endeavor being pursued. To a large extent, the clinical-educational literature deals with relationships between perceptual abilities and school achievement, with the subject of specific learning disabilities receiving a great deal of current interest. The relevant experimental literature, on the other hand, deals largely with the organization and structuring of the perceptual processes along with some emphasis on their developmental aspects. The concerns and investigations of both of these fields should be of keen interest in a study which is concerned with the educational development of children between the ages of 3 and 8.

As indicated above, educational and experimental psychologists approach their subjects from two different points of view. The educational psychologist is concerned with problems of improving educational systems or determining methods to deal more effectively with children who have failed to progress normally within the systems as they now exist. The experimental psychologist, on the other hand, in the search for basic structures and causal connections finds the existing educational system far too uncontrollable an environment for the application of rigorous experimental design. In general, his research is not tailored to the applied needs of the educator or the educational psychologist.

One of the results of this dichotomy is that few experimental procedures have been translated into individual difference measures. In the present study, practical constraints make it desirable that equipment requirements be limited and that at school ages the measures be amenable to group administration. Few experimental studies yield instruments that meet these specifications. However, it is the work emanating from the experimental tradition that offers some of the most intriguing hypotheses about the

development of relationships among perceptual variables. Thus, the problem becomes primarily one of translation of variables into measures rather than just selection among measures.

Drawing upon information from the fields of comparative psychology and physiology, Sherrington (1951) concluded that normal development is lawful and age-specific with regard to the ability to utilize information from the environment. As Hebb (1949), Forgus (1966), and Birch & Lefford (1964) have stated, evidence suggests a hierarchical model to represent the development of perceptual skills as a function of nervous system development. The literature suggests at least three research strategies which could be followed in ivestigating such a model.

A first strategy would be to use a series of unimodal tasks with items of increasing difficulty. For example, there is considerable evidence that in reproducing forms, a child is first able to draw a circle, then a square, and then a triangle in that order (Beery, 1967). This type of model has been utilized to establish developmental norms and deviations from them for diagnostic purposes. However, this approach alone provides little insight into the differentiation of skills underlying the tasks.

A second strategy proposed by Birch and Lefford (1964) would involve testing of multiple sense modalities. There is evidence (Abravanel, 1968; Denner & Cashdon, 1967) that some sense modalities and some cross-modal connections mature before others. However, a problem with this approach is that measures of intersensory functioning tend to be specific to the tasks involved rather than reflective of a unitary general ability, and would be difficult to generalize from (Klein, 1961; Wohlwill, 1968). Further, most of the work done in the area of cross-modal transfer is visual-haptic or visual-kinesthetic. Since proportionally little of the normal school curriculum is built around the connections between these modalities, pursuing this strategy would seem to lack direct relevance to the study.

A third strategy attempts to look at the processes involved in visual perception from the perspective of functional levels or degrees of effective differentiation. In following this approach Birch & Lefford (1964) employed a series of three unimodal tasks using the same set of two-dimensional geometric forms as stimulus materials. The tasks involved (a) recognition: matching a standard to a series of alternatives; (b) analysis: finding in a whole figure isolated parts of that figure (angles and lines); and, (c) synthesis: choosing a set of parts which may be combined to construct a standard figure.

These processes closely parallel the developmental stages discussed by Goldman (1962). In summarizing research on this point, Goldman describes three-year-olds as "whole-perceivers," who see few details. Four- and five-year-olds more often notice and comment on parts. "At nine years begins the final phase of perceptual development--that of synthesis and integration."

Measuring these functions, Birch and Lefford found a developmental age trend in normal children and a mean difference between groups of normal and brain-injured children. These trends became

progressively clearer going from the discrimination to the analysis to the synthesis tasks. On this latter task, in the normal group, scores became progressively higher across age levels, while in the brain-injured group, no such developmental trend was evidenced. The results thus indicated that the amount of deficit of the impaired group increased with both increasing task complexity and age.

Farnham-Diggory (1967) investigated synthesis on a more complex level, requiring the children to demonstrate a series of synthesized concepts composed of various combinations of eight previously learned ideas. In this context, a significant developmental trend was noted among normal children between the ages of 3 and 7, whereas no such result was found with brain-damaged children between the ages of 4 and 13. This latter group displayed a considerable deficit at all ages. These results are in full agreement with those obtained by Birch and Lefford. Furthermore, since the task involved in this study was directly analogous to a basic element of the reading process, it points to the potentially crucial role of the ability to synthesize in educational development.

Another line of inquiry pertinent to the present discussion is encompassed by a recently defined area--perceptual learning. In a series of reports (E. Gibson, 1953; E. Gibson, J. Gibson, Pick, & Osser, 1962; E. Gibson, Osser, Schiff, & Smith, 1963; A. Pick, 1963), Gibson and her associates have discussed the acquisition of certain perceptual discriminations which are primary to learning to read. It is their hypothesis that certain "distinctive features" (Jakobsen & Halle, 1956) of letters are relevant to the process of learning to discriminate one from another for purposes of reading. Based on these distinctive features, a set of letter-like forms have been constructed and administered to subjects between the ages of 4 and 8. From this research, the authors have drawn a set of age curves for frequency of errors in discriminations between certain transformations of letter-like forms. They reason that during the period 4 through 8 the child is concerned with learning to read and with making the discriminations between transformations which are relevant to reading. They thus hypothesize that greatest growth in performance at these ages will be in discrimination skills related to reading. The performance curves presented support the hypothesis. The procedures, however, were developed for laboratory investigation and were reported primarily in the context of comparisons among age groups. Their properties as individual measures and their appropriateness for a disadvantaged preschool population are unknown. However, it would be desirable to view available perceptual measures from the framework of Gibson's learning hypothesis and the dimensions which were identified.

There are a variety of available perceptual tests which include items varying along these dimensions. Using Gibson's age curves, it is possible to make some assumptions about the kinds of discriminations children will have learned to make at certain ages, and to test these assumptions empirically.

Work summarized by Maccoby (Jeffrey, 1966; Maccoby, 1967; Maccoby & Bee, 1965; Rudel & Teuber, 1963) casts some light on the

problem of investigating the reproduction of simple forms by young children. Pointing to the growing evidence (Bower, 1966; Fantz, 1961; Zaparozhets, 1965) that children are able to differentiate between simple geometric forms at a very early age, Maccoby (1967) contrasts this skill with the much more slowly developing skill of form reproduction. Maccoby and Bee (1965) have offered the "number of attributes" hypothesis to account for the lag between discrimination and reproduction. Although Johannsen (1967) points out the theoretical differences between this position and the "distinctive feature" hypothesis of Gibson, for the purposes of this study it might be more important to note that both theories imply a perception of the elements of a figure in addition to the whole. This implication was examined by Bower (1966) and Zaparozhets (1965). They independently studied eye movements of infants and young children when presented with geometric forms. Both found that younger children (infants to 3 year-olds) tended to look at a figure with a single fixation rather than exploring the contours with their eyes. Zaparozhets found this phenomenon in the haptic sense area also.

This tendency can be contrasted with that of older children and adults who tend to explore the contours and details of a stimulus. Maccoby states that, while holistic perception may suffice for a simple discrimination, it will not for making a copy. In the laboratory, Goodson, a student of Maccoby's, tested her hypothesis using 3-to 5-year-old subjects. She found that training children to break a figure into its component parts by directing their attention to angles, horizontal lines, right, and left resulted in improvements in copying, whereas training in the motor skills involved produced no improvement.

While the findings relating to the structural elements of form reproduction are still quite tentative, there exists a large body of literature relating this variable to school achievement, intellectual ability, and brain damage. Koppitz (1964) reports a correlation of .68 between scores on the Bender-Gestalt and diagnoses of brain damage in children. Wechsler (1967) on the Geometric Design subtest of the WPPSI, presents correlations of .52, .32, and .52 respectively with the Stanford Binet, Peabody Picture Vocabulary, and Pictorial Test of Intelligence.

In general, it can be concluded that (a) the processes involved in copying designs are complex, (b) a number of forms can be ordered in a fairly fixed sequence in relation to the ages at which children are able to reproduce them, and (c) whatever abilities are involved in form copying, the global skill is related to educationally important variables.

Examining even this restricted sample of the literature on perception in children, it becomes quickly obvious that the possible number of questions that might be asked and the variables that might be included are almost limitless. As one means of coping with this problem, the present authors propose a schema which to a large extent is based upon the findings of Birch and Lefford (1967). An attempt has been made to include in this schema those abilities which from empirical or logical argument seem to be most

relevant to educational development. The bases for determining relevancy are twofold: (a) the ability is one which shows considerable development during the preschool-primary years and is related to educationally required skills, or (b) the ability is related to educationally required skills and may be impeded by neurological pathology.

Thus, we are interested in those perceptual abilities which are developing during the preschool and primary years. We wish to look at the correlates of different levels of this perceptual development and the degree to which the developed abilities seem to be modified through school experiences. In addition, we are interested in measuring some perceptual abilities which for the most part are developed by age three. Poor performance on these measures would be indicative of physiological pathology.

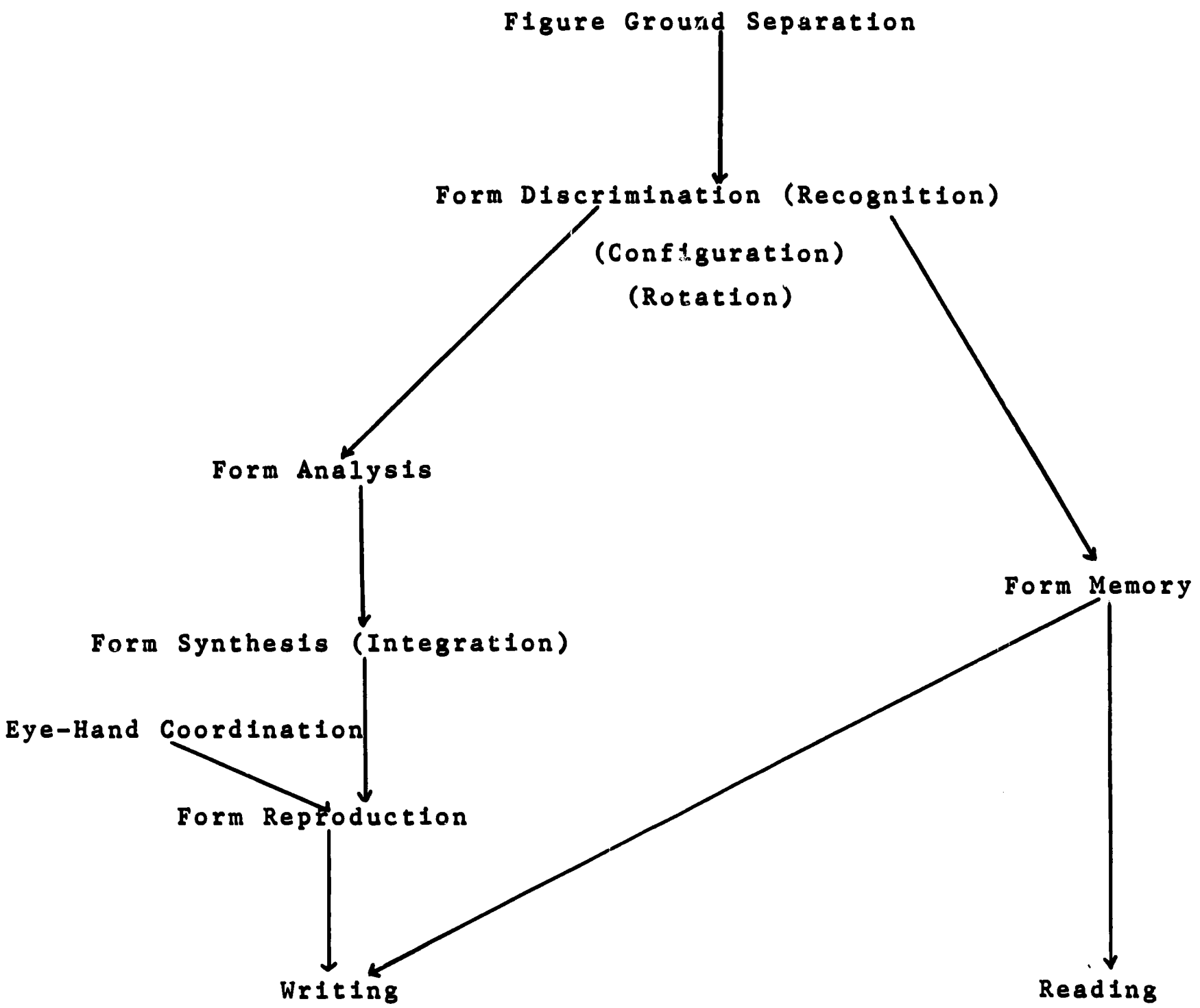
The fact that the study is longitudinal and that certain skills will be tapped at an even lower level than usual again suggests the use of a hierarchical model to guide the conduct of the study. Following this thinking, an initial attempt was made to arrive at a series of integrated tasks, each of which represented the addition of a single skill to the previous task, thus predetermining a hierarchical order enabling one to pinpoint, for an individual, the specific element which is deficient. It was found, however, that few skills could be arranged in such an order (as could, for instance, form discrimination and memory), and that certain abilities seem quite important yet could not be fitted easily into this conception.

Thus, while the initial outline of measures contained elements of a hierarchical model, it was not articulated as such. However, further literature review and limited field testing allowed for the structuring of a tentative hierarchical schema encompassing the present area of interest. This schema is presented in Figure C.2. The variables are "selected" in the sense that they are the variables which seem to be most immediately related to educational processes. The variables are labeled "perceptually relevant" rather than "perceptual" since they extend well beyond the area Travers (1967b) reports as the only agreed upon element of a definition of perception; i.e., that research on perception is concerned with events near the input (sensory) end rather than the output. Thus, the schema is neither all inclusive within the perceptual domain nor limited strictly to that domain. However, it is offered as a tool that may be useful for selection of measures within the area of perception and the integration of this area with the cognitive domain. In addition, it allows us to examine the structure to identify intermediate steps or additional paths that are of key importance, yet missing from our conception. By specifying an ordered schema, we are making explicit hypotheses about the relationships among connected variables which are open to empirical verification.

Figure C.2 outlines certain attributes, from the ability to separate a figure from its background to the more complex constellation of skills involved in reading and writing. The lines represent hypothesized necessary precursor relationships so that, for example, it is hypothesized that if one is unable to analyze

Figure C.2

TENTATIVE SCHEMA OF THE ORGANIZATION
OF SELECTED PERCEPTUALLY RELEVANT VARIABLES



a form into its elements, he will not be able to synthesize these forms from their components.

It should be noted that the relationships outlined are hypothesized as being necessary but not sufficient conditions. Thus, for example, this model does not include all the abilities that enter into the development of the ability to read. It does, however, imply the hypothesis that the processes preceding reading in the shcema must necessarily be developed above some unknown threshold level before one can develop the ability to read. Many other characteristics not covered here; e.g., motivation, vocabulary, may be crucial for this development to take place. However, it is hoped that this schema and the measures associated with it will be useful in predicting reading difficulties and, perhaps, providing a framework for investigating different educational strategies to cope effectively with these difficulties.

As noted above, the variables are highly selected--indeed, the schema does not include the complex of variables associated with auditory inputs. This is not to downgrade the importance of such variables. On the contrary, measures of audition and auditory discrimination (See Appendix c, Auditory Screening) are included in the data collection and analyses plans. However, in a pretest conducted in the summer of 1968, measures in the auditory mode, approximating the complexity of those suggested for the visual mode, presented intolerable difficulties in understanding for the Head Start children involved.

This was true for both standard instruments and those developed specifically for the pilot study.

In light of these experiences, it was decided not to attempt a parallel formulation for the auditory mode. Instead, measurement in this area will be approached at the lower levels through the screening instruments listed in Appendix c, and at the more complex integrative levels by the tests listed under the Listening and Speaking classifications outlined in Table C.4.

Selection of measures. Table C.2 presents a listing of instruments tentatively selected to measure the variables enumerated in Figure C.2. It may be noted that neither figure-ground separation at the initial level in the model, nor the reading and writing skills at the terminal end are included in the measurement scheme. (For measures of reading and writing see Table C.4). These latter variables are included in Figure C.2 primarily to outline the bounds of the proposed inquiry. Table C.2 specifies measures for all the remaining variables.

The measures were chosen on the basis that: (a) the administration procedures and the task itself are at an appropriate conceptual level for the ages in question and (b) empirical investigations indicate the measure has sufficient discriminability to be a potentially useful contributor of unique variance to the study.

Because some of the measures selected are taken from the experimental literature, characteristic statistics of individual difference measures such as test-retest reliability or predictive

Table C.2

CANDIDATE MEASURES RELATED TO FIGURE C.2

Variable	Proposed Test*	Proposed Ages					
		3 1/2	4 1/2	5 1/2	6 1/2	7 1/2	8 1/2
Discrimination-Rotations	Position in Space (Stern)		X	X	X	X	X
Discrimination-Configurations	Johns Hopkins Perceptual Test (Rosenberg)	X	X	X	X	X	X
Form Memory	No test currently available; propose using discrimination test with modified directions		X	X	X	X	X
Form Analysis	Analysis of Visually Perceived Forms (Birch & Lefford)		X	X	X	X	X
Form Synthesis	Synthesis of Visually Perceived Forms (Birch & Lefford)			X	X	X	X
Eye-Hand Coordination	Sequin Form Board	X	X	X	X	X	X
Form Reproduction	Developmental Test of Visual-Motor Integration (Beery)	X	X	X	X	X	X

* See Appendix c for information on specific tests.

validity are frequently unavailable. It is hoped that some of these statistics might be obtained in further testing over the next few months. Additional items might then be added where greater precision as an individual difference measure is desired.

In summary, an attempt has been made to identify variables within the perceptual domain that seem to be crucial to early educational development. Instruments have been suggested to measure these variables and test whether the hierarchical-developmental model offered conforms to empirical reality. Once the data has been collected, the relationships will be determined between departures from sequence and depressed score levels on the one hand, and both educational achievement and neurological impairment on the other. The information thus obtained can be used as moderator variables in spearating out atypical subgroups from some of the main analyses and for either suggesting educational strategies or testing their effects if such strategies exist in the sample.

Measurement of Attention, Memory, and Concept Formation

Gerald W. Bracey*

The three areas, attention, memory, and learning, are obviously related in intimate but very complex ways. It would be most useful if one could provide a model to describe the relationships. A brief glimpse at the research literature, however, is enough to convince anyone that such a model of theory would be premature. The concept of attention, long banished from American psychology, has returned in the last decade, but the word at present lacks either determinacy or uniformity of meaning. Models of memory, especially short-term memory, can be found with varying degrees of rigor, but their comprehensiveness varies inversely with their precision; concept learning, while receiving extensive treatment by researchers, has not been related in any systematic fashion to notions of attention and memory (see Kleinmuntz, 1967, and Trabasso & Bower, 1968, for exceptions to this statement). Finally, even where there has been extensive research, the overwhelming bulk of it has been carried out on adult subjects. A model describing lower class three year olds would indeed be tenuous.

What follows is a brief discussion of each of the areas, noting its general relevance and, where indicated, its special relevance to the study being undertaken.

Attention. Purged from psychology by Watsonians who accused it of being a mentalistic construct, attention has recently returned to favor. The return seems to have been forced by dilemmas faced by perceptual theorists on the one hand and learning theorists on the other. At the perceptual end, some attention-like construct is required to explain why the organism is not overwhelmed constantly by the amount of stimulation striking its receptors--selection must occur somewhere. Learning theorists had an equally vexing problem of explaining sudden shifts in S-R relationships purely on the basis of existing theory.

There are at present a number of tests said to reflect attentional processes. Among these are vigilance, visual fixation (and concomitant cardiac responses), orienting responses (and concomitant physiological changes), separation of multiple auditory messages, visual search (scanning), tasks of incidental recall, and speeded classification tasks such as the Stroop. Some, but not all, of these tasks have been used with young children (although not with the target population). For the most part, these are studies of incidental learning and separation of multiple auditory inputs. However, the techniques which have been used do not appear to be adaptable to the present study. Despite the absence of tried techniques, however, it seems critical to assess some aspects of the development of attention due to the important role it seems to have in cognitive development. Grim (1967) and Elliot (1964, 1966) have reported that young children do not seem to be as able as older children either to

*The assistance of Anne Bussis on the sections concerning the measurements of classification skills is gratefully acknowledged.

initiate a "set" or to hold one given by an experimenter. Such an inability intuitively seems detrimental to cognitive performance and would presumably be reflected in certain kinds of attention tasks. If one further assumes that attention-set is requisite for planful behavior, and such an assumption seems plausible, then attention assumes even more importance. The studies of Maccoby and Konrad (1966, 1967) and Maccoby and Hagen (1965) carry a similar implication. While Elliot, Grim, and Maccoby have all utilized highly refined experimental techniques, White (1968) has reached a similar conclusion from ratings and naturalistic observations. White has described a phenomenon of attention called dual focus which actually carries the implications of the experimental work one step further. Dual focus refers to the ability to sustain attention in one task while maintaining an awareness of occurrences in the environment. He has found that children whom teachers rate as having high ability are described by his observers as being dual focussers.

Thus, we have on the one hand, information that attention undergoes important developmental changes, and on the other hand, information that attention is an important dimension of individual differences in cognitive abilities. While no research has been done with the target population on attention development, most literature on the development of children in deprived environments would lead to the inference that attention development is depressed with respect to certain kinds of stimuli. Unfortunately, the kinds of stimuli implicated are those which seem important for success in school. It appears crucial, therefore, to examine the development of attention and, especially, to examine family and school influences on this development.

Memory. It is important to examine memory from different viewpoints. In the first place, it is important simply to examine memory alone (insofar as that is technically feasible). Second, we shall want to know how memory is affected by attentional processes: most contemporary models of short-term memory contain a box labeled attention in their flow charts. This box is in front of the STM box. The relationship seems to be one of a filter or determinant, though the relationship is not always spelled out in detail. Third, we shall want to know how memory affects attention and other processes. In this section, we deal only with the first issue.

Like attention, the importance of memory to cognitive development is evident. It is somewhat surprising, therefore, to find that memory has received perhaps even less systematic study than has attention by developmental researchers. But such is the case. Most studies have been concerned exclusively with a variety of short-term memory--memory for position--and can hardly be called systematic.

The phenomena of memory are as numerous as those of attention, as are the techniques of studying them. Most theorists divide memory into three types: immediate memory (which decays over a few hundred milliseconds and is of little interest for this study), short-term memory (which has a small capacity and a slower, indefinite decay rate), and long-term memory (which is presumed to involve

a permanent structural change). There are, in addition, retrieval phenomena (such as tip of the tongue experiences) and changes in organization over time. Memory scanning has also recently been a subject of study.

Of the aspects of memory available for study, those which seem most relevant to this study concern the decay of short-term memory and the organization of memory. Konorski (1961) has argued that transient memories play a large role in our everyday experience. Feldman (1963) has demonstrated that limits in short-term capacity make it possible for persons to see patterns where none really exist. Hence, short-term capacity is crucial to the carrying out of sequential activities or in determining how extensive a sequence is possible. Thus, like attention, short-term memory capacity seems crucial for the development of planful behavior. But, obviously, capacity without organization is not sufficient.

Concept Formation. This study would hardly be adequate without some measure of learning ability. Indeed, the aim of preschool projects often is to improve the educability of children, a portion of which is simple learning ability. Most of the tests to be given (especially those related to school) simply report where the child is at some point in time; i.e., what he has attained. Certainly a number of tests require induction and other processes requisite for learning, but these processes are lost to the experimenter because the end result is simply a right or wrong answer.

Once it is decided that a measure of learning is required, there remains the problem of deciding what kinds of learning to measure and what procedure to use. Ideally, one would like to administer a "true" concept formation task where the child would leave knowing something that he did not know when he entered. This ideal cannot, of course, be met. As a second choice, however, a task in which the child must guess what concept the experimenter is using--a standard concept acquisition task--seems useful. In such a task, although one cannot examine the child's ability to handle new information, one can look at the strategies he uses in learning what the experimenter is up to. Thus, one can obtain some data on rudimentary information processing strategies that the child possesses (or does not possess).

This type of information--about information processing strategies--seems especially important in dealing with the target population of the study. Most descriptions of the environments of these children contain either implicit or explicit statements that these environments set up reinforcement contingencies which require (at best) simple trial-and-error learning (at worst the contingencies produce insoluble problems to the child).

Additional information can be gained when this task is taken in conjunction with the attention and memory tasks. In an attention task, an attempt is made to control memory, and the goal of the task is simply information selection. In a memory task,

an attempt is made to control attention, and the goal of the task is simply to output the input. In a concept acquisition task, however, both attention and memory are unconstrained and, in addition, there are operations being performed on the information which has been selected and stored. With such a task alone, it is difficult to tease out components which affect the overall performance (one paradigm of concept acquisition does yield information on attention: see Appendix c, no. 81). It is to be hoped that by having independent measures of attention and memory, some statements can be made about the relative contribution of the separate processes in determining performance. That is, what is the relationship, for example, between learning rate in concept acquisition and forgetting rate in short-term memory?

Developmental psychologists have recently come to realize that training a child to a criterion on one task does not mean that the child has acquired a response that will generalize to similar tasks. This has been evidenced most clearly by the seemingly endless series of conservation training procedures, but it has been demonstrated elsewhere also. In fact, at the 1968 convention of the American Psychological Association, Gollin stated categorically that training without a transfer task was inadequate when dealing with young children. A series of learning set problems (such as oddity) could be used to gather such transfer information. It seems feasible, however, to gather such information from the concept acquisition tasks proposed (see Appendix c, nos. 81 and 82).

In a paragraph above, it was mentioned that "operations are being performed on information," but there was no indication of what these operations might be. Among the operations brought into play during a concept acquisition task are categorizing operations. Usually, since concept acquisition studies are carried out with adults, one can ignore such operations, assuming them to be equally developed in all subjects. With very young children, however, such an assumption clearly cannot be supported. Without doubt, children will differ in the type of classification schemata brought into play in such a task and the efficiency with which these schemata are used. It is important, therefore, to have an independent measure of what kinds of classification schemata a child possesses.

It should be pointed out, however, that the importance of measuring classification skills lies not only in their use as a "covariate" for the concept acquisition task; classification skills are of immense importance in their own right. With respect to the development of such skills, Piaget (Flavell, 1963; Piaget & Inhelder, 1964) has argued that the classificatory structures which emerge during the preschool years are essential foundations for the later concrete logical operations. With similar emphasis, Bruner, Goodnow, and Austin (1956) state that "the utilization of categories represents one of the most elementary and general forms of cognition by which man adjusts to his environment." Finally, from an educational standpoint, it has been

asserted that classification skills constitute the cornerstone for all concept learning (Roeper & Sigel, 1966; Formanek & Morine, 1968).

Traditionally, classification skills have been measured by various types of sorting tasks. It is planned that several sorting tasks will be included in this study. Details of planned procedures are discussed in Appendix c; the following paragraphs are concerned with some general factors governing the selection of sorting tasks.

Reasons versus performance. The reasons young children give for groups they have just made in a sorting task often bear no discernible relationship to the characteristics of the group. Formanek and Morine report this type of behavior among four and five year olds; it has also been noted in a study carried out at ETS (Educational Testing Service, 1967). In the latter study it was especially prevalent among the four year old children and among low socioeconomic status children. Most important in its implications for the present study was the finding that immature reasons (silly or egocentric responses) apparently had different causes in different status groups. For middle class children, there appeared to be some correlation between the level of the grouping and the level of the reasons. Lower class children, on the other hand, were more apt to give low level reasons for higher level sorts. That is, for middle class children, reasons tended more to reflect difficulties with the sorting itself, while for lower class children, there was an indication that the trouble was in finding the appropriate verbal responses for describing their actions. On the basis of these data it is recommended that the present study include at least one sorting task which yields both performance and reasons data.

Free versus structured sorts. A free sorting task permits the child to choose any number of objects from an array and to arrange these objects by any criteria he chooses. For some purposes, such as determining preferred mode of sorting, this technique can be quite useful. If, however, one wishes to determine if particular categories are available to the child, then free sorting tasks present several difficulties. Very young children will most assuredly define the task in different ways or be "pulled" into some particular grouping by cue salience. In such cases, the experimenter has trouble deciding about the availability of alternative categories. In the ETS study mentioned above, for example, dramatic shifts in performance were found when instructions were modified from free sort instructions to apprise the child that there was a problem to be solved and that objects went together for reasons. For this study, the measurement of concept utilization (categorization) seems best achieved by presenting the child with a clearcut problem rather than a free, unstructured situation. If the problem is to be restructured during the course of testing (as it might be to determine availability of a particular concept), such restructuring should be clearly under the control of the experimenter.

Measurement of Analytical Functioning

Diran Dermen and Anne Bussis

Witkin (Witkin, Dyk, Faterson, Goodenough, & Karp, 1962) has conceptualized a general dimension--psychological differentiation--that is reflected in a number of more specific areas of functioning, including the perceptual, intellectual, emotional, motivational, defensive, and social spheres. We will limit most of our attention here to the first two, the rest being considered under the personal-social section of this report.

The first of the two to be considered, the perceptual (field-dependence-independence) measures, is conceived as reflecting the analytical aspect of perception. This concern with the perceptual realm is reflective of the history of Witkin's work which started in the perceptual area. In fact, it was the discovery of the broad implications of individual consistencies in this area (these consistencies proving to be related in meaningful ways to aspects of behavior in the other areas listed above) that led to the statement of the general construct of psychological differentiation.

The prime measures of field-dependence-independence have been the rod-and-frame test, the tilting-room-tilting-chair test, and the embedded figures test (Witkin, Lewis, Hertzman, Machover, Meissner & Wapner, 1954; Witkin et al, 1962). The rod-and-frame test involves the presentation to the subject in a dark room of a luminous rod surrounded by a square luminous frame. Both rod and frame are tilted and the subject's task is to adjust the rod to the true vertical (either through remote controls or instructions to the examiner) in the presence of the tilted frame. In the tilting-room-tilting-chair test the subject is situated in a tilted chair within a tilted room. The score obtained is a body adjustment score in which the subject instructs the examiner to rotate the chair to what he, the subject, perceives to be the true vertical (again in the presence of the tilted visual field). In both of these tests the subject's score is the average absolute deviation from the true vertical. In the embedded figures test the subject must find (disembed) a simple geometric figure contained within a larger figure. Each of these tests requires the subject to separate an item (the rod, his body, the simple figure) from the field or context (the frame, the room, the larger figure) of which it is a part and which, therefore, exerts a strong influence on it; in other words, to "break up" a field or configuration (Witkin et al, 1962). Scores on the perceptual tests have been shown to be highly reliable, stable over time, and highly intercorrelated. Although scores are stable, as reflected in high correlations between scores over periods as long as 14 years (tests administered at ages 10 and 24), there is also consistent growth toward more field-independent performance up to age 17 (Witkin et al, 1954, 1962; Witkin, Goodenough, & Karp, 1967). The dimension defined by the above measures appears to be

closely related to Thurstone's flexibility of closure factor.

"Intellectual problems that call for a high degree of creative activity, but do not involve perception directly, often also require that 'parts' be separated from the context in which they are embedded and brought into new relationships (Wertheimer, 1945). It is likely--and this is, of course, subject to experimental test--that if a person has this basic ability to 'break up' a configuration it will be manifested not only in straightforward perceptual situations, but in problem-solving situations as well" (Witkin et al, 1954). Initial studies confirmed a significant relationship between perceptual field independence and general intelligence (Binet and WISC IQ), and also showed a tendency for the performance scale score of the WISC to be more highly related to the perceptual measure than was the verbal score. To investigate the matter further, a series of factor analytic studies were conducted interrelating WISC or WAIS subtests, measures of perceptual field independence, and a number of perceptual and problem-solving situations (Goodenough & Karp, 1961; Karp, 1963). Three factors appeared in each of these which were common in their interpretation and involved subscales of the Wechsler tests. These were: (a) a "verbal comprehension" factor defined by the Vocabulary and Comprehension subtests of the WAIS and WISC and also by the Information and Similarities subtests of the WISC; (b) an "attention-concentration" or "memory" factor defined by the Digit Span and Arithmetic subtests of both scales, by WAIS Arithmetic Operations and Digit Symbol, and by WISC Coding; and (c) an "analytical ability" factor defined by the perceptual field independence measures and by Block Designs and Object Assembly on the WISC and WAIS and by Picture Completion on the WISC. Also loading the "analytical ability" factor were measures of Guilford's adaptive flexibility factor, a factor closely related to the Thurstone flexibility of closure factor mentioned above. Thus, the results just described lend considerable support to the idea of a general cognitive style--"analytical vs. global field approach"--running through perceptual and intellectual functioning. For the sake of brevity this will be referred to as "analytical functioning" through the rest of this section.

Having described the characteristic measures of the analytical functioning dimension, some of its implications for behavior outside of the laboratory should be elaborated. As is reviewed in the rationale for the Block Design subtest (Appendix c), there has been found among boys with mild mental retardation a striking disparity between performance on the "analytical functioning" factor and the "verbal comprehension" factor of the WISC (Witkin et al, 1966), the former averaging 13 prorated IQ points higher in non-institutionalized samples to 20 prorated IQ points higher than the latter in institutionalized samples. Thus, there is evidence that verbal functioning plays a disproportionate role in determining the application of the "retarded" label. In the same paper the finding is presented that girls with Turner's syndrome (the presence of only a single X chromosome in contrast to the normal complement of two X chromosomes in females) have a marked analytic-verbal discrepancy in the opposite direction to

that found with the retarded boys; i.e., their average prorated verbal comprehension IQ was 112.5, their prorated analytical IQ was 84.0. Thus, there is some evidence for a genetic factor in the determination of cognitive patterning. As Witkin points out, it is unclear at present whether the chromosomal anomaly accounts for the analytical deficit or the verbal strength.

There is evidence that the more global child or adult has a less articulated conceptualization of his own body than does the analytical peer. His figure drawings are found to be less articulated, these ratings correlating substantially with the analytical factor of the WISC, but not with the attention-concentration or verbal comprehension factors. Thus, more articulated figure drawings are found to be associated with more analytical functioning. These same children who appear to be more analytical appear also to have a more clearly developed sense of separate identity. "[They] tend to be less dependent on the examiner in test situations for definition both of the task and their role in it; they are regarded by others as socially more independent; they show less interest in and need for people and a relatively intellectual and impersonal approach to problems; they are usually less influenced by authority, tending to be guided by values, standards, needs of their own; they are apt to have a stable self-view; and they are less attentive to subtle social cues given by others" (Witkin et al, 1962).

Examination of the list of characteristics just named as descriptive of the more analytical individual reveals that not all are desirable in all situations, a finding in some contrast to the initial impression that the more differentiated individual has the best of everything. He may, on the contrary, be something of a social isolate, less aware of, and hence less responsive to the needs of others around him. This relative insensitivity to others may be reflected in less motivation to please others and, in the school situation, less responsiveness to social sanctions. In a somewhat different sphere, but one not as far removed as one might initially think, is a very recent study of patient-therapist interactions among more- and less-differentiated patients early in therapy (Witkin, Lewis, & Weil, 1968), in which it was found that verbal exchanges occurred more frequently with undifferentiated patients and much more frequently when both therapist and patient were undifferentiated. At the same time differentiated patients tended to give longer comments than did the undifferentiated patients. Perhaps the high rate of exchange by the more field dependent individuals (therapist or patient) reflects the tendency for them to be more "tuned in" and responsive to social stimuli--in this case the other half of the patient-therapist dyad. It was also found that among field dependent patients there was more of a tendency to direct hostility inward toward the self, while field independents tended to direct hostility outward. That these findings have relevance for the classroom situation is certain, though the precise nature of the implications is not yet completely clear.

In this section of the report there has been space to give only some idea of the broad range of implications of the research of Witkin and others in the area of psychological differentiation.

Enough of these have been given, however, to indicate the potential value of including this important general dimension in this study.

Before concluding this section, we must consider the numerous studies which have described a cognitive mode of "analytic functioning" as revealed by categorizing behavior on various classification or sorting tasks (Kagan, Moss, & Sigel, 1960, 1963; Kagan et al, 1964; Sigel & McBane, 1966; Sigel & Olmsted, 1967). Although tasks utilizing different stimuli have been freely used in this research, the basic measurement strategy has revolved around having the subject decide a basis for grouping objects or pictures together in a situation that provides at least two alternative criteria. The subject's response is then scored in terms of the criterion characteristic he uses for grouping--color, shape, function, and so forth. These specific criterion characteristics have been combined into coding systems which identify three general conceptual categories or response styles: <u>descriptive-analytic or global</u> (groupings based on objective stimulus attributes that are either a differentiated part of the total stimulus or which characterize the stimulus as a whole); <u>relational-contextual</u> (groupings based on functional or thematic relationships between the stimuli); and <u>categorical-inferential</u> (groupings based on a class membership concept that involves some inference about the stimuli).

Using the type of coding system and measurement procedure described above, several studies have focused on the age, sex, social class, and behavioral correlates of people who tend to prefer a particular conceptual orientation. With respect to the analytic orientation, it has been found that the production of analytic concepts increases with age among preschool and elementary school children (Kagan et al, 1964; Sigel & McBane, 1966), that it has moderate stability over a 12-month period, and that its stability increases with age (Kagan et al, 1964). As compared with global descriptive concepts, analytic concepts are used more frequently by middle class than lower class children at all age levels studied (Sigel & McBane, 1966). Many reported correlates of analytic style are quite similar to those found by Witkin and his associates. For example, subjects highly analytic on the Conceptual Style Test are more likely to produce highly differentiated interpretations of ink blots and fewer indistinct percepts than nonanalytic subjects (Kagan et al, 1963). On the other hand, there are distinct differences between Witkin's concept of analytical functioning and that described by either Kagan or Sigel and their associates. For the most part, these differences stem from the very different measurement strategies employed by the two approaches. As has been pointed out,

> A central problem in discussing this dimension is the existence of markedly different sets of measurement operations, each of which has been labeled as an index of an analytic tendency. These varied test procedures are probably not assessing identical constructs, and it is

necessary to restrict statements about analytic tendencies to the operations used in any particular study (Kagan et al, 1964).

Perhaps the most striking deviations from the Witkin construct have emerged from investigations of the determinants of an analytic orientation on sorting tasks. Kagan and his associates have presented extensive data which suggest that the production of analytic concepts is determined by the more fundamental processes of reflection and ability to analyze a complex visual array (Kagan et al, 1964). Only with respect to the latter ability (visual analysis) is there a high degree of congruence in meaning and correlates with Witkin's construct of analytic functioning. The reflection-impulsivity dimension (as measured by latency times on perceptual recognition tasks) bears little relation to field independence (as measured by total solution time on the Embedded Figures Test). The reflection-impulsivity dimension, however, has demonstrated a high degree of stability and generality across a varied array of recognition tasks, and it has shown a consistent set of correlates among other cognitive measures. It has been hypothesized that when faced with alternative responses on a conceptual sorting task, the child must first reflect on these alternatives and then have a predilection for visual analysis in order to produce a descriptive analytic response. However, as Kagan and his colleagues (Kagan et al, 1964) have stated: "The points of contact between reflection and analysis and the main stream of psychological theory in cognition are still unclear."

To summarize, the term "analytic functioning" has been used to label a dimension of psychological functioning which has been measured in very different ways--by sorting tasks and by the measures devised by Witkin and his associates. The partially conflicting correlates and meanings of the construct are therefore not surprising and may be accounted for in any of several ways: (1) A single measure cannot reasonably be considered to define a construct adequately. (2) Witkin's research has seemed to deal more exclusively with the perceptual realm, while the research utilizing sorting tasks has dealt with perception, reflection, and, to some extent, conceptualization after perception has occurred (Wallach, 1962). (3) Witkin's work has involved "maximum performance" measures, while the sorting tasks are measures of "preferred style." There is no necessary conflict between results of studies differing in the ways just given, but careful effort should be made to account for the differences in a systematic manner. It is just such a clarification for which multivariate studies are suited, and it is precisely for this reason that we have tried in the present study to include a variety of measures where there is need to examine the components of related but not identical constructs.

Measurement Related to Theories of Piaget

Edward Chittenden and Masako Tanaka

One of the most significant contributions to our understanding of cognitive development comes from the theories and research of Jean Piaget and his colleagues. Recognition of the importance of his work has been steadily growing (Baldwin, 1967; Flavell, 1963; Sigel, 1964). The present study deals primarily with the preoperational stage (ages 2-7) during which representational thought and symbolic processing begin to serve especially important roles in the child's behavior. The preoperational stage is said to be a transitional one, serving as a bridge between earlier-established perceptual and sensory-motor schemas (0-2) and the later, concrete logical operations (7-11).

The present investigation affords an unusual opportunity to learn more about the preoperational stage in general, and to chart its course in the culturally disadvantaged child. More specifically, repeated measures of children's thinking in Piagetian terms can serve at least four aims of the study: (a) Individual differences in cognitive level at any point in time can be related to educational outcomes, including achievements in school-related cognitions and in personal-social maturity. (b) Environmental factors influencing rates of cognitive growth can be studied by relating Piagetian measures to variations in community, family, classroom, and teacher variables. (c) Piagetian hypotheses on developmental sequences can be tested for this population. Such tests are particularly powerful because of the longitudinal feature of the study. (d) Rate of cognitive growth can be viewed as a moderator variable which influences the functional relations between environmental variations and educational outcomes in the child.

In selecting and developing tasks derived from Piaget's work, the investigator has a tremendous range of choices offered him. Over the past 50 years, some thirty books and countless articles on the subject of child thought have been published by the Genevan group. The choice of the particular Piaget-based tasks is obviously influenced by a consideration of the overall goals of the study and the ages and backgrounds of the subjects. The choice, however, is also influenced by an attempt to select measures which relate to central issues in Piaget's theoretical system. For the purposes of this study, the tasks are divided into the following two groups.

The conception of number. The term "number" as used here and as used in Piaget's writings is broadly defined. It is more closely related to the general mathematical concepts typical of the new mathematics programs than it is to the numerical and computational concepts and skills we usually associate with elementary school lessons in arithmetic (Flavell, 1963). It is reasonable, therefore, that number is also being studied in the section on early "academic" objectives.

The Piagetian tasks to be used here include measures of enumeration, correspondence, and conservation. This aspect of Piaget's work has been chosen for several reasons: (a) The child's understanding of number and his ability to reason quantitatively have traditionally been found to be critical elements of scholastic aptitude. Piaget's research on number provides a unique analysis of the genesis of such aptitude and gives us the chance to identify and measure the precursors of the numerical abilities required in school. (b) Number has been thoroughly studied by the Genevans (Piaget & Inhelder, 1941; Piaget, 1952), and their research on this topic has stimulated much research by other investigators in this country. Conservation, in particular, has been exhaustively examined. As a result, there is a good background of information on which to base methodological decisions and interpretation of findings. (c) The number tasks require less verbal interrogation than some other Piagetian procedures. (d) As a group, the number tasks appear to be very useful for tracing the sequence of development from preoperational procedures to operational thought. Piaget reports this sequence in many contexts, but his number research seems to point up this basic change most clearly.

The number tasks will be scaled in difficulty with the intent of measuring development through three levels. Some tasks of enumeration and correspondence are intended primarily for levels I (Global intuition) and II (Articulated intuition) of the preoperational stage, while conservation and other enumeration tasks are intended to be discriminating at levels II and III (Articulated intuition and Concrete operations).

Egocentrism and conception of natural events. These tasks focus primarily upon prelogical characteristics of thought, and they serve as a balance to the "logical-arithmetical operations" emphasized by the number tasks.

Throughout his writings, Piaget has stressed the view that development of intelligence in each period sees a shift from profound egocentrism to a new level of equilibrium. Thus, during the sensorimotor period, the marked egocentrism of the young infant is progressively reduced through the organization of sensorimotor action schema. Correspondingly, during the next major period there is a shift from egocentrism ("animism," "finalism," etc.) of the preschool child to the "depersonalized" logic of concrete operations. And, finally, at the beginning of the period of formal operations there is an adolescent egocentricity which takes the form of a belief in the omnipotence of reflection. Concerning his investigations of the young child, Piaget has stated (1967):

> In summary, these diverse manifestations of this early thinking are consistent in their prelogical character. They all manifest a deforming assimilation of reality to the child's own activity. Physical movements

> are goal-oriented. Force is active and substantial because it is conceived on the model of muscular strength. Physical reality is animated and alive, while natural laws must be obeyed. In short, all of reality is construed with the self as the model.

In Piaget's theories, egocentrism in the child's thought constitutes a necessary foundation for intuitive thought and for the eventual emergence of logical operations. In the beginning, the "self" is the necessary model of thought, a model which makes possible the acquisition of more advanced forms of reasoning. In a general way, the preoperational stage is viewed as a required preparation for later thought and Piaget does not view it as a "measles" stage which young children should "get over" as soon as possible. If Piaget's assumptions are correct, and if (as has been shown in many studies) disadvantaged children demonstrate a lag in the acquisition of concrete logical operations, then we may ask the following basic questions in our research: Is the apparent retardation in the development of logical operations due to a prolongation of egocentrism in disadvantaged children? To a kind of hanging on to such egocentric modes as animism and finalism? Or, is retardation due more to an inadequate egocentric foundation? In other words, is egocentric thought as well as intuition markedly impoverished in this group, and thereby a poor preparation for later thought? Finally, how do parental belief systems appear to affect these developments? What is the impact of teacher and curriculum on cognitive growth?

Evidence on egocentrism in thought can come from several procedures. We propose to include the following: (a) Tasks consisting of questions about various natural events (night, rain, etc.) which rely heavily upon verbal responses. These tasks are patterned after Piaget's earlier work (1929, 1930) and more recently, after Laurendeau and Pinard (1962). (b) A test of spatial egocentrism which does not rely on verbal replies.

Finally, the tasks on the conception of identity combine the concerns with egocentrism and number, and thus bridge the two groups. Measures of object identity should also be important for relating cognitive and personal-social development.

We believe we can assess the child's developmental status in Piagetian terms by measuring the cognitive areas discussed above and described in Appendix c. Piaget has provided a conceptual framework for the analysis of child thought. In addition, much basic research underlying the construction of suitable instruments has already been accomplished, and in many instances a straightforward modification of existing procedures is feasible.

Measurement of Creativity

William C. Ward

The study of creativity has been approached from a variety of theoretical perspectives, ranging from the psychoanalytic (e.g., Pine & Holt, 1960) to the factor-analytic (Taylor, Smith, & Ghiselin, 1959), and with a multiplicity of measures--artistic productions, children's free play activities, ratings of scientific contributions, and so on.* Some of this work, depending on evidence of outstanding production in one or another field, provides little orientation for work with children's creativity. In other cases, however, creativity has been conceptualized as an ability (or combination of abilities) present to some degree in any normal individual; it may then be a relevant variable in the functioning of normal children as well as of extraordinary adults. Its relevance at any age level depends on the degree to which individual differences in creativity can be found which are reliable, which are at least to some extent distinguishable from general ability, and which are predictive of differences in relevant behavior.

Within this framework, two major approaches to creativity have been that by Guilford (Guilford, 1956, 1959c; Guilford, Kettner, & Christensen, 1956), working mainly with adults; and that by Torrance (1962, 1965), mainly with children. Both groups, in their definitions and theoretical discussions, speak of creativity as an aspect of effective thinking or problem solving. However, rather than attacking the latter directly, they have attempted to isolate a relatively specific set of abilities which (in addition to those represented in conventional IQ tests) may contribute to such thinking. The result is that, while the step-by-step analysis of complex problem solving is still a hypothetical exercise (see, e.g., Guilford, 1967), an interesting set of components of creative thinking has been proposed. These fall mainly in the area which Guilford (1956) has labeled the operation of divergent thinking--thinking which goes in many different directions, rather than converging on a single solution; thinking which involves searching for answers which are good rather than ones which are right. The components proposed through the two approaches differ in some details, but suggest, at the least, that three aspects of creative thinking should be distinguished: fluency, the ability to generate a large number of possible solutions; flexibility, the ability or disposition to shift from one conceptual category to another in the solutions proposed; and originality, the degree to which the solutions proposed are unusual or of high quality.

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*For an overview of alternative approaches to creativity research, see Golann (1963). For more extensive coverage of attempts to measure children's creativity, see Arasteh (1968) and Torrance (1965).

This triad of abilities would seem to be a useful starting point for the study of creativity in children. However, much of the work in this area, including that by Guilford and Torrance, has been subjected to severe criticism of both a theoretical and an empirical nature (Thorndike, 1963; McNemar, 1964; Wallach & Kogan, 1965; Wallach, in press). Theoretically, it has been pointed out that the measures employed have been presented as tests of ability, and that they have been administered under short time limits with the demand for rapid generation of ideas. In line with the introspective reports of numerous individuals whose creative ability is generally acknowledged (Ghiselin, 1952), it is argued that neither time pressure nor a test-like situation is appropriate for creative thinking. The empirical justification for this attack rests in the finding that the so-called measures of creativity generally have little in common with one another, except to the extent that they share variance with measures of general intelligence, so that there is little basis for conceptualizing them as other than usual, and probably unreliable, measures of IQ.

On the other hand, there has accumulated evidence that a closely related but somewhat less heterogeneous set of measures, given under appropriate administrative conditions, is sufficient to define a creativity dimension which is clearly distinguishable from general ability. The measures under consideration require the subject to generate a number of ideational associates in response to a simple problem requirement. The conditions of administration include a freedom from excessive time pressure and, possibly, at least implicit assurance to the subject that he is not responding to a conventional abilities test. Wallach and Kogan (1965), measuring this dimension in fifth grade children, required their subjects to produce as many ideas as they could in each of five tasks, including both "verbal" tests (e.g., name uses for common objects) and "figural" ones (e.g., suggest interpretations for simple abstract patterns). Tests were administered individually, under a game-like rather than test-like instructional set and with no time limits; they were scored for number of ideas and for number of uncommon (unique) ideas. Results under these conditions included substantial intercorrelations across all creativity measures, with no separation appearing between tests with verbal content and those with figural content, nor between uniqueness and fluency tests. Correlations between creativity measures and measures of conventional intelligence and achievement were close to zero. In addition, they found that a variety of measures in the behavioral, cognitive, and personality domains are influenced by the child's creativity level, either alone or in interaction with general ability. Further work (Pankove & Kogan, 1968; Wallach & Wing, in press), including theoretically related work by Mednick (1962), extend the range of behaviors which can be predicted by an ideational-associates based creativity index. Several investigations also show directly the importance of the use of relaxed or game-like, as opposed to test-like, conditions for both mean level of performance (Dentler & Mackler, 1964) and score intercorrelations (Kogan & Morgan, 1969) on these tests.

Similar tests and administrative conditions have been found to be appropriate for younger children. Using a modified version of the Wallach and Kogan (1965) battery, Ward (1968a) has worked with kindergarten and early elementary grade children of diverse intelligence and SES, finding evidence for the presence of the creativity dimension and for its clear separation from general intelligence. Appendix c includes a proposal for inclusion of two of his subtests in the present study. Ward (in press) has also found indirect evidence for the existence of the creativity dimension in still younger children; but that work and pilot investigations with young disadvantaged children suggest that alterations in measurement technique will be required for its assessment at prekindergarten ages. Appendix c also contains a description of a substitute measure for use with younger children, in order to provide as much continuity in creativity assessment as is possible over the range of ages included in the present study.

The measures described above all require verbal responses. An alternative, observations of the child's nonverbal behavior, is also represented in the study. In the "Open Field" situation, observations will be made of spontaneous play in an enriched environment. Ratings of such play, attempted in several investigations (Lieberman, 1965; Markey, 1935), have been largely a function of general ability level. However, the more objective procedures to be employed here may help eliminate halo effects and isolate aspects of play which are related to later verbal creative performance. Additionally, a nonverbal assessment situation in which the child is given a task set, rather than allowed to play undirected, is also included. Here, the child can demonstrate the variety of uses to which he can put a play object.

Finally, a measure of children's drawing will be included. There is some evidence that aspects of artistic creativity are independent of the ideational fluency dimension (Wallach, in press). However, the psychological meaning of drawings by the young disadvantaged children we are studying, except for those special drawing tasks which are related to IQ scores (Goodenough, 1926), remains to be explored.

Measurement of "Academic" Objectives of Early Education Programs

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While skills in "reading, 'riting, and 'rithmetic" are no longer regarded as the sole purpose of early education, activities oriented toward their development still occupy a very large proportion of the school and preschool day. And teachers, parents, Congressmen, and--later--college admissions officers, the Defense Department, and employers decry a situation in which children have not developed some reasonable competencies in these areas well before the end of elementary school. The longitudinal study of disadvantaged children offers an unusual opportunity, as well as an obligation, to study how children develop in verbal and quantitative areas and in the accrual of the kinds of general knowledge which our schools and society value. Most constructively, the study can attempt to define the kinds of educational programs and other influences that are associated with desired progress in these areas for children of differing characteristics.

The verbal, quantitative, and general knowledge tables that accompany this section were derived from a consideration of what the academically successful and competent third grader with the benefits of good instruction and a reinforcing environment could be expected to be like:

- He could listen to connected discourse of the appropriate level and comprehend and interpret what he heard. He could remember main points and details. He would be aware, as he listened, of some of the special word and sentence properties characteristic of American English.
- He could read paragraphs of the appropriate level and both comprehend and interpret what he read. He could extract key pieces of information from the written text. He would recognize some of the special properties of written words and sentences.
- He could speak audibly, comprehensibly, and connectedly about a topic appropriate to his age, using appropriate word choices and syntax.
- He could write intelligibly, legibly, and with some organization about a topic relevant to him, using word choices, forms, and correct sentence structures appropriate to his age. At the same time, he would misspell only the more difficult words and would adhere to the simpler conventions of punctuation-capitalization.

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*Ann Jungeblut provided major assistance in the selection and cataloguing of measures; Terrence Keeney consulted most helpfully on the aural-oral measures and reviewed the verbal sections of the manuscript.

- He would have a practical understanding of some of the rudimentary concepts of mathematics--the meaning of numbers, the use of symbolism, the meaning of fundamental operations with numbers, and embryo notions of function and relation, approximation and estimation, proof, measurement, and geometry. He could do simple computations using whole numbers and would have some early acquaintance with fractions and decimals.
- He would have a repertoire of general knowledge to draw from for use in coping with everyday problems of living, understanding references in what he heard and read, communicating ideas to others, and forming a base for subsequent, more advanced learning.

A child with these skills at the end of the primary grades would have a kit of very basic tools with which to take advantage of the academic and vocational educational opportunities ahead of him. More important, he would have some necessary, if not sufficient, prerequisites to obtaining a lifetime of personal satisfaction from learning for the sake of learning. Certainly, these are major things that early schooling is all about; and compensatory early schooling (as in Head Start) is designed primarily (though frequently, and appropriately so, indirectly) to give lower class children as much opportunity as more affluent children to reach these intermediate goals.

Verbal. Table C.3 presents in outline form some of the key abilities judged to be important as precursors to, concomitants of, or aspects of the verbal receptive (listening and reading) and productive (speaking and writing) skills. There is some suggestion of hierarchical ordering; e.g., abilities first to perceive and then to discriminate forms would seem to be necessary before the behavior called "reading" could occur. However, the items labeled A-M within each column cannot be interpreted as falling in a strict logical order, such that either the skill on one line is necessary in order for the skill on the next line to appear, or the skill on a given line comprehends all the skills on lines preceding it. Obviously, too, the skills on the same line across columns cannot be regarded as comparable in either developmental or test difficulty terms; the child recognizes the meaning of words he hears before he recognizes the meaning of words he sees (reads), and it is more difficult for a young child to write "ball" than to say it when he is shown that object.

Items on lines G and H relate more directly to knowledge about the language than to skill in the language, although the two are closely intertwined. Throughout the educational system, it is assumed that teaching awareness of word and sentence properties contributes to effective listening, reading, speaking, and writing behavior. Fortunately, except for those for whom the structure of language is a major study in its own right, the tendency to emphasize such subareas as knowledge of grammar or spelling rules (in the abstract sense) over actual verbal expression and reception is declining in the schools. The

Table C.3

VERBAL SKILLS

	Receptive		Productive	
	Listening	Reading	Speaking	Writing
A	Auditory Perception	Visual Perception	Sound Production and Modulation	Mark Making
B	Tone Discrimination	Form Discrimination and Analysis		Form Copying
C	Phoneme Discrimination	Letter Discrimination	Phoneme Articulation	Letter Copying
D	Word Discrimination	Word Discrimination	Word Articulation	Word Copying
E	Letter Recognition		Letter Naming	Letter Making
F	Word Recognition		Word Naming	Word Making
G	Recognition of Word Properties	Recognition of Word Properties	Application of Knowledge of Word Properties	Application of Knowledge of Word Properties (incl. Spelling)
H	Recognition of Sentence Properties	Recognition of Sentence Properties	Application of Knowledge of Sentence Properties	Application of Knowledge of Sentence Properties
I	Recognition of Word Meaning	Recognition of Word Meaning	Labeling	Labeling
J	Recall	Extraction	Retelling	Writing from Dictation or Written Text
K	Comprehension	Comprehension	Comprehension and Interpretation through Oral Reading and/or Structured Speech	Comprehension and Interpretation through Structured Writing
L	Interpretation	Interpretation		
M			Creative Speech	Creative Writing

most prevalent point of view today is that teaching awareness of word and sentence properties will enable the child to generalize to unfamiliar verbal situations. Thus, for example, the first grade teacher is concerned about teaching associations of sounds with letters in order that the child can read not only "ship" and "fire" in his reader but also "shire" when he first comes across it in Robin Hood.

In terms of measurements proposed for the longitudinal study, categories G and H include a number of different aspects of words and sentences; e.g., how letters generally go together to make words ("glave" looks like an English word while "glavg" does not); the operations performed on words to make them plural, possessive, past tense, etc.; fine points of usage (a ladder is "long" when it is lying on the ground, "tall" when it is leaning against the house; we look "up" and "down" before we cross streets; both books and milkshakes are referred to as "thick"); making subjects and their predicates "agree"; considering the "cases" of pronouns; struggling with the circumlocutions necessary to create a future tense in English; and observing conventions of punctuation and capitalization.

For those who would restrict "reading" to a process called "decoding," or "writing " to a graphic skill, the table will go too far. The scheme implies that a child may be hearing a story if he can point to a picture of its hero, Herbie the Bear, but he is not demonstrating a very high level of a skill labeled "listening" unless he can tell you what Herbie might do next in the story; similarly, a very high "oral reading" score would not be given to the scientifically impressive but juncture-less, inflection-less oral sentence output of a computer. The conceptualization here very strongly links the verbal skills to reasoning processes. The "Interpretation" category encompasses language behavior ranging from "transformations" in terms of meaning to evaluation and inference.

Any discussion of programs designed to foster children's verbal development, or assess it, must bring up the possibilities of conflict between school language (usually approaching standard American English or at any rate having it as its model) and the language of the child's home and neighborhood. The longitudinal study has, by the nature of the sample selection, deliberately eliminated the need for concern about English versus a foreign language (in the conventional sense). However, the fact that the study focuses on economically disadvantaged children guarantees that the home language of many of them can be better characterized as "dialect" than as "standard," and a number of different dialects or subdialects are virtually assured by the regional and racial distribution of the study subjects.

Educators, belatedly wearing their badges of concern about this matter, have divided themselves into the usual three camps: liberal, conservative, and moderate. The liberals, identified strongly with the issue of self-concept, would have the teacher

learn the child's dialect and communicate with him exclusively in it; early education programs would focus upon development of the child's ability to express himself and learn in his own dialect (Stern & Keislar, 1968); standard English would be treated much later and then as a "second language." The conservatives, perhaps through lethargy, would stress standard English exclusively in the schools and would take as a measure of success their ability to stamp out nonconforming usages. The moderates would agree with the liberals that self-expression in any idiom is probably important to self-concept, and that it is essential that the schools not contribute, through language or other programs, to the kind of alienation between child and home which characterized some of the early educational efforts with immigrant populations in this country. On the other hand, the moderates who view education as a liberating process would not want to see a person's freedom of choice to leave the ghetto, or farm, or to take up certain careers, thwarted by basic language difficulties. They would, therefore, try to do two things at once: use the language program both to help the child respect his own environment and to enable him to have access to other environments.

The verbal assessment strategy for the longitudinal study is closest to the position of the moderate educator. Referring again to Table C.3, abilities to discriminate between phonemes or to mimic phonemes appear to be important to aural-oral language development in dialect or standard English; and, as long as "nonwords" (nonsense syllables) are used, these abilities can be measured in a relatively unbiased fashion. Visual discrimination and copying abilities too would seem to have relevance regardless of the child's milieu of dialect or standard American English. However, the measurements with respect to recognition and knowledge of word and sentence properties are oriented toward standard English, as are the reading and listening activities I-L. The subject matter and structural properties of the latter are close to what children might read in modern children's books or in newspapers and hear over television; this is not dialect, for dialect is not the stuff of the mass media. In the "labeling" activities, the concern is with perception of meaning and breadth of vocabulary; a labeling response in terms either of the local dialect or a standard English word could be counted correct. Pronunciation would not be scored here or in "retelling." However , conformity to standard pronunciation would be one of the "oral reading" scores, as it might be in the measures of "free" speech. More important, in the latter, as in"free" writing, a separate score (and greater weight) would be assigned to ideas and content.

An important consideration in much of the verbal measurement is the distinction between mechanics and content. In conducting the study, we have to be quite as concerned with the educational as with the research implications of the measures. If a study bearing the prestigious monograms of ETS and OEO

Table C. 4

VERBAL MEASURES

Verbal Skill		3 1/2	4 1/2-5	K	Grade 1	Grade 2	Grade 3
Listening	A	Auditory Examination during "Medical"					
	C,D	Children's Auditory Discrimination Inventory		Wepman Auditory Discrimination			
	G	ETS Matched Pictures Comprehension			Cooperative Primary Word Analysis		
	H	ETS Matched Pictures Comprehension					
	I[1]	Peabody Picture Vocab.		Metropolitan Readiness 1	Cooperative Primary Listening		
	J,K[2]	ETS Story Sequence I		Metrop. R2 ETS V5	Cooperative Primary Listening		
	L			Metrop. R2 ETS V5	Cooperative Primary Listening		
Reading	A	Visual Examination during "Medical"					
	B[3]	Johns Hopkins Perceptual Test					
	C,D			Metrop. R3	Cooperative Primary Word Analysis		
	G				Cooperative Primary Word Analysis	Coop.Pri.Writing Skills	
	H					Coop.Pri.Writing Skills	
	I,J,K,L				Cooperative Primary Reading		
List/Read	E			Metrop. R4			
Read/Speak	E			Harrison-Stroud 6			
	F				Gray Oral Reading		
Speaking	C,D	Massad Mimicry					
	G[4]		ITPA Auditory-Vocal Automatic				
	H[5]	Massad Mimicry, TAMA Tell-a-Story					
	I[6]	Peabody Picture Vocab. (adapt.)					
	J		ETS Story Sequence II				
	K,L		ETS Story Sequence II		Gray Oral Reading		
	M	TAMA Tell-a-Story					
Writing	B[7]	Developmental Test of Visual-Motor Integration					
	C			Metrop. R6	Clymer Sentence Copying		
	D				Clymer Sentence Copying		
	E,F,G					TAMA Sentence Dictation TAMA Write-a-Story	
	H					TAMA Completion A TAMA Write-a-Story	
	J					TAMA Sentence Dictation	
	K,L					TAMA Completion B	
	M					TAMA Write-a-Story	

[1]Also measured by 2 items in the Preschool Inventory, 3 1/2-K.

[2]Also measured by some items in the Preschool Inventory, 3 1/2-K.

[3]Also measured by some items in the Metropolitan Readiness Test 3, K.

[4]Also indicated in responses to TAMA Tell-a-Story, 3 1/2-Gr. 3.

[5]Also indicated in responses to Gray Oral Reading, Gr. 1-Gr. 3; ITPA Auditory-Vocal Automatic 4 1/2-Gr. 1.

[6]Also measured by 3 items in the Preschool Inventory, 3 1/2-K.

[7]Also measured by 4 items in the Preschool Inventory (3 1/2-K) and some items in the Metropolitan Readiness Test 7 (K).

failed to take account of the verbal mechanics-content distinction, or failed to measure some of the important objectives of early educational programs, teachers might be influenced to disregard the same matters. Conversely, by emphasizing through measurement some of the important aspects of intellectual and personal-social development which are now unmeasured in school and preschool programs, the study can serve the useful function of focusing teacher and administrator attention on them.

Returning to Table C.3, it is important to make explicit what has been implied in the preceding paragraphs: the table entries correspond to conceptual distinctions, useful in plotting the measurement strategy for the study; no claim is made that the entries are empirically distinct. In fact, the research summaries of Calfee and Venetzky (1968) and others leave one discouraged about identifying separate skills--or differential development of a child with respect to the skills if they are separate. The problem is confounded by the general lack of reliable instruments sensitive to skills well defined even at the conceptual level. The Table C.4 translation of the Table C.3 scheme into specific measures handles the problem as best it can within the present state of the art.

Each of the measures listed in Table C.4 is described in detail in Appendix C. Some of the considerations guiding decisions as to whether, when, and how to measure items listed in Table C.3 are given below:

1. There are practical limitations on testing time; therefore, only the items judged most important and possibly distinct developmentally and psychologically are included. This study enables us to take a new and different look at the interrelationships and structures of verbal abilities over time.
2. Measurement of a skill is eliminated if it is expected either that 90 percent of the children at a given age level in the study cannot respond validly to an appropriate measure, or would show perfect or near-perfect performance.
3. Preference is given to measures which can appropriately be given in the same form or in vertically equated forms over the age range for which measurement is judged desirable, in order to facilitate longitudinal comparisons.
4. Other things being equal--or nearly equal--preference is given to standardized measures, so that study results can be compared with results obtained by other investigators, characteristics of the study group can be compared to those of other known groups, and interpretable scores can be supplied to the local educational authorities who made the testing possible and thus deserve a reasonable amount of feedback. (Preference is <u>not</u> given to standardized tests where the only reportable scores are IQ's or other types of scores known to be subject to misinterpretation and misuse in school situations--especially, in some cases, with the disadvantaged.)

5. In order to gain efficiency from a testing hour and not confuse children unduly with a multiplicity of testing formats, emphasis is placed on using as few tests as necessary and obtaining information on as many of the Table C.3 items as possible from each.
6. Where possible, for purposes of both practicality and validity, measures are proposed which require minimum training of the administrator.
7. Group measures are not recommended before the last months of kindergarten.
8. Some selection of measures is made in light of the desirability, discussed elsewhere in this report, of obtaining information about cognitive styles and personal-social characteristics manifested during the testing process.
9. The Handbook for the Cooperative Primary Tests (1967) --tests proposed as major measures for grades 1-3 in the study--includes a discussion of some of the decisions the authors made as they attempted to find ways to administer and ask test questions in order to secure valid responses from young children:
   - Suit vocabulary, sentence structure, and content to the developmental levels and backgrounds of the children.
   - Minimize the dependence of one skill area upon another skill in the measure; e.g., do not require reading on a listening test.
   - Use attractive formats and stimulating materials to engage the interest of young children.
   - Offer "practice" experiences before "real" tests.
   - Avoid formal time limits (unless speed of performance is the major variable of interest).
   - Provide for repetitions of instructions at any time when repetition may help children grasp the nature of the task (unless "first-hearing" listening comprehension is the specific measurement objective).
   - Use similar formats and instructions to the extent possible so that children will not be confused by diverse tasks.
   - With multiple-choice formats, ask children to pick the best answer or the one that is correct, not to identify the exception or atypical characteristic.
   - Intersperse "difficult" and "easy" tasks so that some children will not become discouraged by a long successless sequence.
   - Select the particular combination of stimulus and response modes which is integrally suited to each task or question to be posed.

Similar concerns figured prominently in the selection or development of other verbal measures recommended for use with each of the age groups of the longitudinal study.

Table C.5 summarizes the stimulus-response modes characterizing the proposed verbal measures across age levels. It will be noted that the major stimulus for the listening tests is always auditory; in responding, the child does not have to read, write, or speak (other than to make a "same-different" indication for the Wepman test). Similarly, measures under the reading category all present visual stimuli, and the child responds by pointing to or marking associated forms, pictures, letters, words, or sentences; he does not have to speak, write, or listen to anything other than general instructions. The stimuli for the "free" speaking and writing exercises are pictures. At appropriate levels on other speaking and writing tests, however, weight may be placed upon listening or reading skills in order to secure the samples of behavior desired.

Quantitative. Table C.6 summarizes the areas covered by the quantitative measures proposed in this section of the report. Number recognition, number writing, and counting are the first items in the list because of the stress placed on them in preschool programs and because they are important behaviors preliminary to, or useful for demonstrating the presence of, more advanced concepts.

The heading "Number concepts" includes meaning of the positive integers (the child may recognize "3" but have little appreciation of "three-ness"), one-to-one correspondence, ordinality (physical notions of order, ordinal numbers, inclusion, exclusion); and, at upper levels, meaning of zero, meaning of fractions, place value, and number properties (even-odd, conservation, divisibility).

As the child first comes to grips with mathematical symbolism, he learns that the "7" on the page bears some relationship to the number of candles on his birthday cake or the children in a group. Other aspects of "Symbolism," as listed in Table C.6 and measured in the tests proposed for grades 1-3, are special mathematical notations (e.g., signs of operation and equality in grade 1; signs of inequality, greater than, and less than at upper levels), algorisms, and mathematical statements.

"Operation concepts" and "Computation" are listed separately in the table. Ideally, the child would have the first as he did the second; certainly, understanding of what computations mean is essential to eventual progress in mathematics, as opposed to mere number work. However, some children--and adults, for that matter--can add, subtract, multiply, and divide with creditable speed and accuracy without fully understanding what they are doing, and the skills are valued enough in their own right to be separately measured.

Concepts of "Function and relation," as measured by the instruments of Table C.6, range from the "Which is bigger... slower...heavier...?" notions included in the Caldwell Preschool Inventory to a small number of more sophisticated instances such as "How many cars are there for each truck?" in the upper level of the Mathematics test.

Table C.5

STIMULUS-RESPONSE COMBINATIONS FOR VERBAL MEASURES

Skill	Stimulus		Response
Listening	Auditory:	words	Oral (same-diff.) indication
		words + pictures	Point to or mark picture
		sentences + pictures	Point to or mark picture, arrange pictures in order
Reading	Visual:	forms	Point to or mark form
		pictures	Mark letters, words
		letters	Mark letters
		words	Mark pictures, words
		sentences	Mark pictures, words, sentences
Listening/Reading	Auditory:	letters	Mark letters
Reading/Speaking	Visual:	letters	Oral - letter
		sentences	Oral - sentences
Speaking	Auditory:	words	Oral - word
		sentences	Oral - word, sentence
		sentences + pictures	Oral - sentences
	Visual:	pictures	Oral - word, sentences
Writing	Visual:	forms	Copy form
		letters	Copy letters
		sentences	Copy sentences, write word in sentence
		pictures	Write sentences
	Auditory:	sentences	Write sentences

Table C. 6

QUANTITATIVE MEASURES

	Coop. Preschool Inventory (3 1/2-K)	Metropolitan Readiness Test 5 (K)	Coop. Primary Mathematics (Gr. 1)	Coop. Primary Mathematics (Grs. 2-3)
Number recognition	-	x	-	-
Number writing	-	x	-	-
Counting	x	x	x	-
Number concepts	x	x	x	x
Symbolism	-	-	x	x
Operation concepts	-	x	x	x
Computation	-	-	x	x[1]
Function and relation (comparison, simple ratio)	x	x	x	x
Approximation	-	-	x	x
Proof (data sufficiency)	-	-	-	x
Measurement	-	x	x	x
Estimation	-	-	x	x
Geometry[2]	x	Test 3 (6 items)	x	x
Total items	24	26 (Test 5)	55	60

[1]Additional computation exercises will be added at grades 2 and 3.

[2]Form discrimination (included as a component of Geometry in the Mathematics Tests) is also measured by visual discrimination tests in the battery.

Concepts of "Approximation," "Proof," and "Estimation," in their emergent state, are deemed important to treat in the primary grades and are measured by a few items of the Cooperative Primary Mathematics forms by such tasks as these:

- Which of these might be the answer when you add a number a little bit more than three to a number a little bit more than seven? (Approximation)
- Sue said that the dog weighs more than the cat. The dog weighs twenty pounds. What else do we need to know to find out if Sue is right? (Proof)
- About how many more flower pots of the same size can be put on this shelf? (Estimation)

Measurement areas which children can (and frequently need to) become familiar with at an early age include money, time, linear measurement and notions of distance and rate, liquid measurement, dozen, pounds, and degrees Fahrenheit. However, it is important that they learn more than just that there are 12 inches in a foot: Do they have a notion of how long an inch or a foot is? Which one of these is about three feet wide and six feet tall? A tablet...an automobile...a door? It is also important that they develop sound notions of appropriate measuring instruments: If I wanted to measure how deep this swimming pool is, which of these would be the best thing to use? A ruler...a measuring cup...a thermometer? These ideas are included under the "Measurement" category in Table C.6.

The "Geometry" category includes form discrimination (like and unlike shapes in various sizes and orientations), definitions (e.g., square, circle, triangle), and notions of location and distance in a plane.

As the foregoing discussion indicates, many of the quantitative items include a substantial reasoning component, measured more specifically in other instruments proposed for the study. There is also a close relationship between some of the quantitative items and Piaget-related measures in the study.

The considerations guiding decisions about selection of the quantitative measures are very similar to those listed for verbal measures. Table C.7 shows the stimulus-response combinations used in the quantitative questions. It will be noted that the children are not required to read anything other than mathematical symbols.

General knowledge. There are a number of overlapping reasons why the strategy to monitor children's growth in general knowledge is appropriate for the longitudinal study:

1. General knowledge is one of the most prevalent operational definitions of "intelligence." Not only have the most respected authors of intelligence tests featured general knowledge questions in their measures, but also the man on the street (and the teacher in the school) tend to judge people (and pupils) as intelligent or not, mainly on the basis of what they seem to know.

Table C.7

STIMULUS-RESPONSE COMBINATIONS USED IN QUANTITATIVE QUESTIONS

Instrument	Stimulus	Response
Preschool Inventory (Quantitative Items)	Auditory - verbal	Oral - verbal
	Auditory - verbal	Point to object
	Auditory - verbal + visual (form)	Point to picture
Metropolitan Readiness (Test 5)	Auditory - verbal + picture	Mark picture or numeral
	Auditory - verbal	Mark numeral
Coop. Primary Mathematics	Auditory - verbal + visual	Mark picture, numeral, etc.
	Visual (pictures, numerals, etc.)	Mark picture, numeral, etc.
Supplementary computation exercises	Visual - numbers	Perform computations

2. More important, certain kinds of general knowledge are absolutely essential to functioning and surviving in society, and it is one of the major duties of the school and home to see that children acquire these pieces of information. Imagine how difficult life would be if one did not know what cues to use for crossing streets safely, how to send a letter, what weight clothing to wear, what to use to cut paper or bread with, where to go with a toothache, or what one's name was! In certain respects, disadvantaged children may acquire, chiefly through necessity, more of some of these practical kinds of information than their more affluent peers.
3. Other kinds of information enable the kinds of communication, social interaction, and pleasure which are deemed so important in the "good life." One simply cannot understand many things he reads or hears unless he has a broad background of general knowledge, in addition to reading and listening skills. The sports commentator's description is gibberish unless one knows something about the game; a reference to "all the king's men" means almost nothing to one unfamiliar with Humpty Dumpty. It is especially important for preschools and schools to provide disadvantaged children with many varied experiences leading to acquisition of a broad range of general information, since their homes are probably especially deficient in this respect. The child will never "make it" in the middle-class world if he doesn't know what the middle-class world is talking about.
4. Of course, general knowledge is important, too, as a base for acquiring other general knowledge. Schools stress this proposition almost to excess and sometimes with mistaken notions of hierarchy; e.g., it isn't really necessary to learn American history before one tackles European history. However, there are many instances where a person simply cannot become informed about B if he does not have some knowledge of A.
5. Finally, the inclusion of general knowledge measures in the study allows a more comprehensive assessment of explicit school goals than a measurement strategy limited to skills and aspects of personality and social development. The elementary schools do teach science, social studies, art, music, and occasionally some literature, as well as reading, writing, arithmetic, and "sharing." It seems desirable to find out--at least to a limited degree--whether children are learning anything in these areas.

About a third of the items in the Cooperative Preschool Inventory can be looked upon as general knowledge items in the sense meant here. (Another third can be called "quantitative skills" and the rest "verbal skills.") It is proposed that these items be supplemented with additional ETS (TAMA) general

Table C. 8

GENERAL KNOWLEDGE

	Preschool Inventory	TAMA G.K. Supplement			TAMA General Knowledge		
	3 1/2-K	3 1/2	4 1/2	K	Gr. 1	Gr. 2	Gr. 3
Self	x	-	-	-	-	-	-
Social environment (incl. adult roles)	x	x	x	x	x	x	x
Physical environment (incl. animal life)	x	x	x	x	x	x	x
Health and safety (incl. aspects of food, clothing)	x	x	x	x	x	x	x
Practical arts (incl. tools)	-	x	x	x	x	x	x
Consumer behavior	x	x	x	x	x	x	x
Sports and games	-	x	x	x	x	x	x
Art (incl. colors) and music	x	-	x	x	x	x	x
Literature	-	x	x	x	x	x	x
TV and comics	-	x	x	x	x	x	x
Other	x	x	x	x	x	x	x
Total items[1]	21	25	25	50[2]	50	50	50

[1] Overlap of items between successive TAMA forms (for longitudinal comparison purposes): 10 identical items for 3 1/2-4 1/2, 4 1/2-K; 20 for K-Gr. 1, Gr. 1-Gr. 2, Gr. 2-Gr. 3.

[2] Some items in the Metropolitan Readiness Test (K) can also be scored in terms of general knowledge.

knowledge items over the range where the Caldwell is appropriate (3 1/2-K) and that general knowledge instruments be added to the batteries for grades 1-3. Table C.8 provides a general outline of the measures.

The stimuli for the Preschool Inventory general knowledge items are all auditory; responses are usually oral-verbal (exceptions: a motor response indicating movement, or the selection of a colored crayon). The TAMA items always present an auditory stimulus and three pictures. At the two earliest age levels, the child points to the "right" picture; from K through grade 3, he marks the appropriate picture.

Further Considerations Concerning the Measurement of Verbal Behavior

Virginia Shipman and Anne Bussis

There is no need to underscore the importance that language functioning has come to assume in modern society nor our concern with the widespread finding of language deprivation in disadvantaged working-class children. Nearly all of today's early education programs feature activities for fostering language development based on these assumptions. The previous section included a discussion of the assessment of verbal skills as defined implicitly or explicitly by the typical preschool or primary school curriculum. This section emphasizes the opportunity which the present study provides for a more extensive analysis of the child's verbal functioning--its relationship to other behaviors, especially those in the cognitive domain, and delineation of some of the environmental factors affecting the course of its development.

In considering significant aspects of language development within a theoretical context, it is necessary first of all to distinguish the two functions which language serves in actual verbal behavior. As stated by Carroll (1964), the two main categories of language function are:

> (1) as a system of responses by which individuals communicate with each other (inter-individual communication); and, (2) as a system of responses that facilitates thinking and action for the individual (intra-individual communication).

Cazden (1966) refers to both subsystems under the more general term "mode of communication" in order to emphasize that they are somehow intimately related. As yet, however, we know little about the nature of that relationship. As Cazden (1966) puts it:

> Of great importance for the study of subcultural differences in child language, we don't know how variation in the use of language for inter-individual communication affects its use as an intra-individual cognitive tool.

To date, only Bernstein's theory and the research it has stimulated make any explicit attempt to relate the two subsystems in the manner suggested by Cazden.

One approach in studying language development has been to consider the functional nature of language from a linguistic viewpoint; i.e., what function or operation is performed by different word classes included in the grammatical structures of the child's speech? While there is no pretense of doing

justice to the field of linguistics in this discussion, a brief and simplified analysis of function should serve to clarify the ways in which language acts as a tool for thought.

The vocabulary of any natural language may be divided into two broad classes--content words and functor words. The content class consists of nouns, verbs, and adjectives; it comprises over 99% of the language vocabulary; and it is an open, continually changing class (i.e., words may be added, dropped out, or combined to create new words without violating the system). The name "content" is given to this class because its words do carry most of the information load in communication. If a child says "mommy lunch," while mother is preparing lunch, the essential content of his message is communicated. The functor class, on the other hand, is quite small and closed to change. It consists of auxiliaries, prepositions, articles, pronouns, conjunctions, and inflections. In contrast to the content words, functors convey little information in and of themselves, their grammatical functions being more obvious than their semantic content. As Brown and Bellugi (1964) have stated:

> Functors have meaning, but it is meaning that accrues to them in context rather than in isolation. The meanings that are added by functors seem to be nothing less than the basic terms in which we construe reality: [underlining ours] the time of an action; whether it is ongoing or completed; whether it is presently relevant or not; the concept of possession and such relational concepts as are coded by in, on, up, down, and the like; the difference between a particular instance of a class ("Has anybody seen the paper?") and any instance of a class ("Has anybody seen a paper?"); the difference between extended substances given shape and size by an "accidental" container (sand, water, syrup, etc.) and countable "things" having a characteristic fixed shape and size (a cup, a man, a tree, etc.).

To Brown's long list might be added the concept of causality, the concept of negation, and the subtle contrasts between connected statements (messages) that are encoded by such words as although, while, but, and and.

Logical analysis of these two word classes leads to the following hypotheses: (a) Content words (nouns, adjectives, and verbs) allow for distinctions to be made between referents in speech and thought, between qualitative aspects of these referents, and between actions performed in relation to the referents. The preciseness of the distinctions made will depend upon whether global or specific content words are used. Inasmuch as a child lacks or is deficient in the manipulation of content words, it is difficult to conceive of symbolic (verbal) representation of experience, let alone symbolic facilitation

of thought. (b) The functor class of words and the class of comparative adjectives would appear to be prime mediators of symbolic cognitive functioning--at least in the Piagetian sense of placing concrete experience in temporal, spatial, causal, intensive (greater than, or less than), extensive (twice as much), and other relational contexts.*

Developmentally, the first grammatical structures in a child's speech consist entirely of words in the content class (noun-noun, verb-noun, noun-verb, etc., combinations). Only gradually are rules for the functor words grasped (language competence) and these words introduced into speech, making for more grammatically complex sentences (language performance). However, since a person never utters in speech all the sentences he is capable of comprehending, oral language performance cannot be considered a direct measure of language competence. What a person says is obviously within the realm of his understanding, but that realm extends well beyond his utterances. The only way to approximate the measurement of language competence is to sample the child's comprehension of various words and syntactic structures. Thus, it should be remembered that while receptive skills precede productive skills in various developmental sequences (listening-speaking, etc.), the receptive domain is always the much larger of the two, and its contents are at least theoretically available for the facilitation of thought. In this study, therefore, we will broadly sample the child's comprehension of both content and functor words. The former will be accomplished by vocabulary tests, and the latter by measures such as the ETS Matched Pictures Comprehension Test and the Harvard Story Completion Test.

Equally as important as the <u>acquisition</u> (comprehension) of various language structures is their <u>utilization</u> in actual speech. Although overt speech is heavily influenced by situational factors, it might be assumed that what is actually used in inter-individual communication is what is most readily available for the facilitation of thought. To the extent possible in this study we will obtain measures of language use under a variety of conditions--direct request for the utterance, spontaneous use in replying to a request to give reasons, spontaneous use in unstructured conversations with peers, etc. Particular attention will be paid to the complexity of the syntax and to whether content words tend to be global or specific. In addition, we will also watch for the occurrence of egocentric speech, or the child's talking to himself in a work or play situation. According to Vygotsky (1962), this is the most vivid indicator that language actually is being internalized and used to direct thought processes.

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*We realize that in Piaget's theory it is the logical concrete operations which facilitate language complexity and intra-individual communication--not vice versa. This study should provide an opportunity to test some of the rival language hypotheses generated by Piaget's and Vygotsky's theories.

Although current extensive activity in linguistic analysis and development has modified the various reinforcement and imitation theories of language learning, the complex task of acquiring language in the early years is, of course, a part of the response patterns significantly influenced by cultural requirements and conditions. For the infant and young child, the acquisition of symbolic (or cognitive) tools occurs largely through the mediation of the mother. The mother's first words when she shows and names objects for her child have a decisive influence on the formation of the child's cognitive processes by creating new forms of reflection of reality in the child (Luria & Ydovich, 1959). The quality of the feedback from the mother has a powerful influence on the child's acquisition of the cognitive tools which he must begin to master if he is to become educated. The mother's influence, therefore, may facilitate the child's cognitive growth or inhibit it. Following Bernstein (1961), the structure of the social system and the structure of the family are seen to shape communication and language; and language is seen to shape thought and cognitive styles of problem-solving by structuring and conditioning what and how the child learns and by setting limits within which future learning may take place (Bernstein, 1961; Sapir, 1933; Vygotsky, 1962; Whorf, 1956). Bernstein (1961) identifies two kinds of communication which have a direct bearing on how language helps to shape thought: restricted and elaborated codes. Restricted codes are stereotyped, limited, and condensed, lacking in specificity and in the exactness needed for precise conceptualization, differentiation, and discrimination. The individual limited to a restricted code is sharply constricted in range of details and concepts and information-processing. In elaborated codes, communication is individualized and the message is specific to a particular situation, topic, or person. It is more differentiated and more precise, permitting expression of a wider and more complex range of thought. In his dynamic interlacing of social interaction and language, Bernstein points out that the social and family structures of lower-class groups foster the development of restricted codes. A major purpose of restricted codes is to promote solidarity and to ease tensions within a group--not to promote cognitive elaboration. Lower socioeconomic groups tend to be limited in their language styles mainly to restricted codes. Upper socioeconomic groups, on the other hand, have available to them not only restricted codes, but also elaborated codes.

Numerous studies have accumulated evidence on specific limitations in the disadvantaged child's ability to label, discriminate, categorize, and generalize. For example, Hess and Shipman (1965), Sigel and Olmsted (1967), and Melton et al (1968), found that children from lower-class homes perform poorly on a cognitive sorting task requiring verbal classifications. The result of the decreased linguistic interaction between parent and children observed in working-class homes and the restricted language styles employed, as reported by Bernstein (1964) and Olim, Hess, and Shipman (1965), is that these children appear hindered in the

discrimination and labeling processes required for classifying. Although a knowledge of naming does not predict the classificatory behavior used, words encourage us to think in terms of categories and help us to isolate relevant properties of objects and experiences. According to Deutsch (1965) and John (1965), deficiencies based on social class are revealed in measures which reflect abstract and categorical use of language as opposed to denotative and labeling usage.

Although general agreement exists that an adverse and deprived environment will impair children's development in language, there is as yet incomplete information about the nature of such inadequacies. Raph (1965) reported in her review of language studies with socially disadvantaged youngsters that the process of language acquisition for these children is more subject to lack of vocal stimulation during infancy, to paucity of experience in dyadic exchanges with verbally mature adults during the first four years, to severe limitations on opportunities to develop mature cognitive behavior, and to emotional encounters which result in restricting rather than expanding conceptual and verbal skills. The language models to which improverished children are exposed are often not only meager, restricted, and incorrect grammatically, but also punitive according to Bernstein (1961), Gray and Klaus (1965), and Hess and Shipman (1968), thus limiting divergence and elaboration in children's thinking and thereby inhibiting their ability to comprehend. As Minuchin and Biber (1967) have pointed out, life circumstances and family style tend to militate against any elaborate, playful, or attentive interchange between adults and children. This is partly a verbal matter but partly a much more comprehensive matter of models for relationship and communication. Thus the perceived deficits in language and concept formation may have many roots and are probably different from child to child.

Thus, considering both the relational and cognitive aspects of language, the child's verbal functioning in this study will be assessed by a variety of measures in a variety of contexts. Not only do we wish to inquire concerning the child's acquisition of school-familiar labels, but we will assess his ability to use and understand grammatical rules for more explicit communication and his ability to give verbal rationales for classifying. Moreover, it is deemed important to observe the child's relative use and facility with verbal vs. nonverbal modes of communication and to differentiate the contexts and varying functions verbal language plays for a particular child. For example, does the child respond verbally to his peers but nonverbally to the teacher or adult tester? When the child speaks, is it to ask for help, or to express his feelings, or to share information, etc.? When playing or working by himself (as in the classroom or open-field situation) does egocentric speech operate to facilitate his problem-solving behavior? Our observation of the teacher in the classroom and the mother in the structured interaction situations will enable us to determine the relative extent to which the child is exposed to an elaborated language model, and the extent to which he is given opportunity for verbalization

and is encouraged to develop elaborated codes in his own communication. The significance of the teaching environment, however, lies not only in the complexity of the linguistic environment but in the structure of the interaction between teacher and learner. As Hess and Shipman (1965, 1968) have shown, the kind of maternal control and regulation used manifests itself in the communication system between mother and child, and this interaction has decisive consequences for the child's cognitive development.

Other data will allow us to relate the extent to which the child's employment of language as an information-processing tool is related to his performance on the variety of cognitive tasks outlined in other sections of this report. We can compare our findings, for example, with those of Stodolsky (1965), who in testing Vygotsky's hypotheses on the critical role of language in cognitive development with 5-year old advantaged and disadvantaged Negro children found that no child performed at a high level cognitively on an object sorting test who did not also attain a criterion level of adequate language functioning on the Peabody Picture Vocabulary Test. As pointed out in many of the rationales for particular measures, the child's verbal facility is an implicit if not explicit requirement of the task. Pointing, for example, does not help a child who does not know the meaning of "same," "different," and/or is unable to follow directions. In fact, a central problem inherent to the study of the role of language mediation is the difficulty of obtaining a measure of cognitive development which is independent of language mediation. Hopefully, this study will help to clarify the respective domains and boundaries of language and cognition. In addition, the child's verbal facility may be expected to relate to his feeling of competency as he finds joy in manipulating words and thereby assumes more power over things in his environment. Analysis of the speaker-listener relationship also will provide clues on the affective relationship contained therein. The teacher's or mother's giving of a rationale to her child not only requires his longer attending to the message and understanding of syntactical relationships, but may impart to the child the feeling that he is worth a rationale and that there is meaning in the world around him.

Utilizing the contributions of various language theorists, this study will provide data on the acquisition of functional grammar, the use of symbolic (language) encoding for thought and on implications of communicative modes (elaborated and restricted codes) for shaping cognitive styles and elaborative thought. Moreover, we will attempt to assess the extent to which during these early years language has become useful to the child as a vehicle for communication and as a tool for processing experience at levels that become increasingly abstract and generalized without losing personal meaning. Relating these data to our knowledge of the child's environment will contribute further to our understanding of how the structure of the social system and the structure of the family shape communication and language and, consequently, cognitive behavior and the child's potential patterns of relation with the external world.

Measurement of General Intelligence

Samuel Messick

General intelligence is such a venerable concept in both academic psychology and popular usage that the absence of a standardized IQ test in a comprehensive longitudinal study of young children deserves some comment. From a psychometric standpoint, the pros and cons of including such a test revolve around two central questions which should be considered separately--one deals with the incremental value of a standardized IQ test as an addition to the proposed measurement base for studying growth in intellectual performance, and the other deals with its value in providing a normative framework for interpreting the results.

In regard to the first question, the critical issue is the extremely limited coverage provided by most IQ tests, such as the Stanford-Binet and the WISC, for a variety of components of intellectual functioning. It is not only that the number of potential dimensions represented is relatively small, but that the quality of measurement obtained by grouping the available items of a given type into "scales" would in most cases be quite deficient. In the Stanford-Binet, for example, the number of items relevant to particular component dimensions is markedly uneven, as is the representation of the dimensions themselves over different age levels. Thus, "subscales" from such a test would not afford adequate substitutes for proposed measures of specific functions, and the global scores that would be added for verbal, nonverbal, and total IQ would contribute little new variance to the study. Since these global dimensions could be readily derived from combinations of scores in the extensive battery proposed, it is difficult--especially under conditions of limited testing time--to justify the inclusion of such a test on grounds of needed additional coverage.

In view of this, the second question raised above poses a problem, for the addition of a standardized IQ test would indeed provide valuable normative information for comparison purposes. This conflict is easily resolved, however, by making sure that adequate provisions for such normative comparisons have been built into the study on other bases. First of all, it should be noted that standardized achievement measures are proposed for use during the school years and that the Cooperative Preschool Inventory (Caldwell) has extensive norms. In addition, since subtests of the WPPSI and the WISC have been separately standardized, the inclusion of some of those subtests in the battery permits the estimation of prorated IQs for particular dimensions of the total scale, if desired. Furthermore, some of the tests in the battery, such as the Caldwell and the Peabody Picture Vocabulary Test, have been shown to have quite high correlations with general intelligence, so that effective regression estimates of IQ can be obtained from combinations of available tests. Finally, it is hoped that sufficient funds will become available to allow the inclusion of a middle-class sample in the study,

thereby permitting comparisons more appropriate with respect to time and locale than are usually possible using published norms.

In addition to these psychometric considerations, however, the social ramifications of IQ testing must also be taken into account. Tests of general intelligence have been widely misused in such a way as to foster the notion of fixed intellectual endowment. Their prominence in the present battery would reduce the acceptability of this study in the chosen communities, where the consequences of an indelible stamp of IQ are seen in everyday social and economic terms.

D. CHILDREN'S PERSONAL AND SOCIAL DEVELOPMENT

Walter Emmerich

Background and Theory

Background. Recent research on personal-social characteristics presents a dazzling array of variables, hypotheses, and methods. While at an earlier time it was thought that an integration of ideas and research might be mediated by a theory (e.g., psychoanalysis) or by a methodology (e.g., projective tests), the dominant current strategy subordinates theory and method to systematic explorations of delimited classes of phenomena, such as achievement motivation, global vs. analytic style, and so forth. Since many research programs on focal variables have been moderately successful, one can argue persuasively and often convincingly in support of a variety of personal-social variables as good candidates for a longitudinal study of psychological and educational development. Indeed, it is precisely because such a good case can be made for so many variables that we face the difficult task of finding some basis for choosing among them.

How might this be done? One approach is to describe (map) the potentially relevant variables, and then select those which seem especially important and measurable in the context of our particular study. This approach is attempted here, but its limitations should be noted explicitly at the outset. A true mapping of variables is possible only within the context of a theory, or at least a coherent "point of view." Because the field has proliferated in the way described above, any theoretically "tight" mapping at this time would be limited to a relatively narrow range of closely related behavioral phenomena. In this sense, what is called for is a separate map for each focal variable! But since our present aim is to include many such variables, we cannot be truly systematic with respect to any one. Thus, we should recognize that there is no satisfactory solution to the dilemma of wanting to broaden our theoretical base at a time when theories tend to be miniaturized and inelastic.

The approach outlined below therefore represents a "quasi-map," an intellectual middleground between a theory and a mere collection of variables. It should therefore be used as a guide rather than as a justification for variable selection.

A general map. This section deals with a general map, and will be followed by more specific maps of subdomains. A schematic representation of the general map is found in Figure D.1.

Outlined in Figure D.1 is a conceptualization of social-personal variables in terms of levels of abstraction. Levels 3 and 4, at the higher levels of abstraction, represent general substantive dimensions of personality found in factor analytic studies of personality or in theoretical discussions of

Figure D.1

GENERAL MAP OF THE PERSONAL-SOCIAL DOMAIN

Level 4

General personality dimensions determined from interrelations among dimensions found at Level 3; e.g., introversion-extraversion.

Level 3

General dimensions of personality found in multivariate research; e.g., rebellious vs. compliant.

Level 2

Personal-Social Motives	Controlling Mechanisms	Attitudes	Interests
e.g., Dependency Aggression Achievement	e.g., Impulsivity-reflectivity, Field dependence-independence	e.g., Toward parent, teacher	e.g., Manipulative, Cognitive Esthetic

Level 1

A. Who makes the appraisal?
1. Target child
2. Mother
3. Father
4. Teacher
5. Tester
6. Trained observer
7. Female peer
8. Male peer
9. Sibling
10. Group

B. Object of child's response.
1. Self
2. Mother
3. Father
4. Teacher
5. Tester
6. Female peer
7. Male peer
8. Sibling
9. Group
10. Concept (attitude)
11. Others

C. In what setting does the behavior occur?
1. Home
2. Classroom
3. School, non-classroom
4. Test situation
5. Community (other)

D. How structured is the context?
1. Formal, structured
2. Informal, unstructured

E. What is the affective "pull" of the setting?
1. Positive
2. Neutral
3. Threatening

F. Age when assessment occurs.
3 1/2
4 1/2
K
1st grade
2nd grade
3rd grade

generalized response tendencies, such as sex-role identification. At the moment, 22 bipolar characteristics are included at Level 3. Level 4 (and perhaps higher levels) includes the higher-order associations expected to emerge among Level 3 characteristics, perhaps forming a single (Damarin & Cattell, 1968), two-dimensional (Peterson, 1960), or circumplex (Becker & Krug, 1964; Schaefer, 1961) structure at the highest level of abstraction.

Level 2 consists of four distinct but interrelated areas of personality investigation: (1) Social Motives, including social needs (Murray, 1938) and the affects (Tomkins, 1962, 1963); (2) Controlling Mechanisms, including cognitive controls and styles (Gardner & Moriarty, 1968; Messick, 1968a); (3) Attitudes (Green, 1954; Rosenberg & Hovland, 1960); (4) Interests (Gesell, 1946; Witty and associates, 1960). Each of these areas is represented in the more detailed maps that appear later.

It is well known that appraisals of personality vary as a function of a variety of contextual or situational factors (e.g., Emmerich, 1966b; Mischel, 1968; Walker, 1967). This situation has been taken by some as evidence that general traits, especially at Levels 3 and 4, do not "exist" as demonstrable functional entities (Mischel, 1968). However, the present scheme assumes that specificity-generality is a continuum rather than a dichotomy, and that several levels need to be considered in order to understand fully the nature of personality organization (Emmerich, 1968). Level 1 in Figure D.1 is meant to contain criteria for differentiating the contexts in which personality variations occur. However, rather than viewing contextual variation as evidence that general personality traits do not exist, contextual determinants are here taken to be axes of differentiation in the personality itself. If, for example, a child's personality in the classroom differs from that in the home, this fact does not necessarily mean that he has few general personality characteristics, but rather that his personality is differentiated with respect to these two settings. Indeed, if his characteristics within each of these settings are reasonably stable, then we already have evidence for some degree of generalization no matter how disparate his behaviors might be between classroom and home.

A "context" is defined by the intersection of particular choices for each of the six bases for differentiation given in Figure D.1. For example, with respect to the child's aggressive behavior, a critical context in the present study might be an observation of a trained observer (A-6) where the child is behaving toward a male peer (B-7) in the classroom (C-2) during a formal instructional period (D-1) in a positive classroom atmosphere (E-1) in the third grade (F-6).

Obviously many more contexts are generated by this scheme than can be sampled in any study. However, by assessing a variety of Level 2 and 3 attributes within key contexts, it

should be possible to arrive at fuller descriptions of personality. For example, by assessing a variety of social motives, controlling mechanisms, attitudes, and interests directly related to the classroom, it should be possible to provide a series of personality descriptions at different levels of abstraction within the classroom context. Hypotheses relating child personality to environmental variations and educational growth could then be tested at each of the several levels of classroom personality description. Perhaps the higher levels will be found to be least changeable throughout the course of development.

Psychologists interested in describing personality sometimes rely upon factor analytic procedures when moving from lower to higher levels of abstraction (e.g., Coan, 1964; Damarin & Cattell, 1968; Guilford, 1959a). Such a procedure can be followed in the present study, and is especially useful for moving from Level 3 to Level 4. However, this procedure assumes that higher level inferences are in fact reducible to lower level covariation patterns. There is no guarantee that this reductionistic assumption will hold. From a strictly logical point of view, it is not clear that variable definitions at higher levels are merely abstract versions of definitions found at lower levels. Thus, while it may be possible to treat lower-level definitions as necessary components of higher-order descriptions, it is much less likely that the former serve to define the sufficient conditions for inferring the latter. On the empirical side, there is evidence suggesting that in the case of certain social motives, such as dependency, the more refined, molecular, and context-specific measures (Level 1) do not correlate with one another, whereas the same variables assessed at a higher level of inference (Level 2) do form a coherent construct (Emmerich, 1964, 1966b; Maccoby & Masters, in press). It follows that efforts need to be made, whenever possible, to assess similar variables at several levels.

General personality characteristics. Table D.1 lists the 22 bipolar characteristics believed to represent a reasonably comprehensive mapping of general personality characteristics. Listed next to each characteristic is a sampling of studies (or theories) in which the dimension has been found (or posited).

Some of the variables listed in Table D.1 may actually be at Level 4. In any case, as already suggested, Level 4 could consist of one, two, or even more dimensions, and its structure should be revealed by the intercorrelations found at Level 3.

Social motives. Table D.2 lists social motives and affects, with particular reference to those researched in children. The theoretical strategy for analyzing the development of social motives is outlined in Emmerich's working paper, OEO Interim Report, February, 1968.

Controlling mechanisms. Table D.3 includes a variety of controlling mechanisms (cognitive controls, styles, coping strategies, defenses, etc.). Representative studies are listed in Table D.3, and relevant findings are discussed briefly in the appropriate sections of Appendix c.

Table D.1

LEVEL 3: GENERAL DIMENSIONS OF PERSONALITY

1. Withdrawn vs. involved (Becker & Krug, 1964)
2. Masculine vs. feminine (Kagan, 1964; Maccoby, 1966)
3. Tolerates frustration vs. vulnerability (Black, 1965; Digman, 1963, 1965; Murphy, 1964)
4. Rebellious vs. compliant (Becker & Krug, 1964; Bronson, 1966; Damarin & Cattell, 1968; Digman, 1963, 1965)
5. Expressive vs. restrained (Becker & Krug, 1964; Black, 1965; Bronson, 1966; Damarin & Cattell, 1968)
6. Tense vs. relaxed (Digman, 1963, 1965)
7. Oriented toward adults vs. children (Maccoby & Masters, in press)
8. Sensitive to others vs. self-centered (Damarin & Cattell, 1968; Stott, 1962)
9. Submissive vs. dominant (Becker & Krug, 1964; Bronson, 1966; Digman, 1963, 1965)
10. Active vs. passive (Emmerich, 1964)
11. Apathetic vs. energetic (Digman, 1963, 1965; Walker, 1967)
12. Stable vs. unstable (Becker & Krug, 1964; Black, 1965; Digman, 1963, 1965; Schaefer, 1961; Walker, 1967)
13. Solitary vs. social (Becker & Krug, 1964; Black, 1965; Bronson, 1966; Emmerich, 1964; Schaefer, 1961; Walker, 1967)
14. Assertive,bold vs. timid, fearful (Bronson, 1966; Damarin & Cattell, 1968; Digman, 1963, 1965; Stott, 1962; Walker, 1967)
15. Dependent vs. independent (Stott, 1962)
16. Constructive vs. destructive (Becker & Krug, 1964; Digman, 1963, 1965; Emmerich, 1964; Walker, 1967)
17. Aimless vs. purposeful (Digman, 1963, 1965)
18. Academically motivated vs. otherwise motivated (Crandall, 1963)
19. Aggressive vs. affectionate (Becker & Krug, 1964; Digman, 1963, 1965; Emmerich, 1964; Walker, 1967)
20. Socially secure vs. insecure (Damarin & Cattell, 1968; Digman, 1963, 1965; Stott, 1962)
21. Rigid vs. flexible (Damarin & Cattell, 1968; Digman, 1963, 1965)
22. Happy vs. unhappy (Walker, 1967)

Table D.2

SOCIAL MOTIVES

1. Abasement (Aronfreed, 1964)
2. Achievement (Atkinson & Feather, 1966; Crandall, 1963, 1964; Kagan & Moss, 1962; McClelland et al, 1953; Rosen & D'Andrade, 1959)
3. Affiliation (Atkinson et al, 1954; Campbell, 1964; Hartup, 1967; Martin, 1964; Moore, 1967; Schachter, 1959; Sears, 1962)
4. Aggression (Bandura, Ross, & Ross, 1963; Bandura & Walters, 1963a; Emmerich, 1966a; Kagan & Moss, 1962; Martin, 1964; Sears et al, 1957)
5. Anxiety (Endler et al, 1962; Hill & Sarason, 1966; Levitt, 1967; Ruebush, 1963; Walters & Ray, 1960)
6. Autonomy-independence (Beller, 1955; Emmerich, 1966a; Hartup, 1963; Heathers, 1955; Martin, 1964; White, 1959)
7. Curiosity (Berlyne, 1960; Smock & Holt, 1962)
8. Defendance (Murray, 1938; Jackson, 1967)
9. Deference (Murray, 1938; Jackson, 1967)
10. Dependency (attachment) (Caldwell, 1964; Harlow, 1958; Hartup, 1963; Heathers, 1955; Maccoby & Masters, in press; Sears et al, 1957; Yarrow, 1964)
11. Dependency (instrumental) (Bandura & Walters, 1963b; Beller, 1955; Emmerich, 1966a; Hartup, 1963; Kagan & Moss, 1962; Sears, 1963)
12. Dominance (Anderson, 1939; Chittenden, 1942; Martin, 1964)
13. Nurturance (Hartup & Keller, 1960; Lenrow, 1965; Martin, 1964)

Table D.3

LEVEL 2: CONTROLLING MECHANISMS

1. Leveling-sharpening (Gardner et al, 1959; Gardner & Moriarty, 1968; Lutzky & Schmeidler, 1963; Santostefano, 1964)

2. Scanning-focussing (Gardner & Long, 1962; Gardner & Moriarty, 1968; Holzman, 1966; Schlesinger, 1954)

3. Field articulation (Gardner et al, 1959; Gardner, Jackson, & Messick, 1960; Holtzman, 1966; Goodenough & Karp, 1961; Messick & Fritzky, 1963; Pederson & Wender, 1968; Witkin et al, 1962, 1967)

4. Constricted-flexible control (Broverman, 1960b, 1964; Gardner & Moriarty, 1968; Holtzman, 1966; Klein, 1954; Rand et al, 1963)

5. Tolerance for unrealistic experience (Klein, Gardner, & Schlesinger, 1962; Klein & Schlesinger, 1951)

6. Conceptual differentiation (Gardner & Moriarty, 1968; Gardner & Schoen, 1962; Messick & Kogan, 1963; Wallach & Kogan, 1965)

7. Tolerance for delay of reward (Mischel, 1961, 1966)

8. Internal vs. external locus of control (Crandall et al, 1965; Lefcourt, 1966; Lefcourt et al, in press; Lewis & Goldberg, in press; McGhee & Crandall, 1968; Rotter, 1966)

9. Risk-taking strategy (Kogan & Carlson, 1967; Kogan & Wallach, 1964; Pankove & Kogan, 1968)

10. Impulsivity-reflectivity (Kagan, 1965; Kagan, Pearson, & Welch, 1966; Kagan et al, 1964; Lewis et al, 1968; Ward, 1968b)

11. Impulse control (Maccoby et al, 1965)

12. Conceptual style (Kagan, Moss, & Sigel, 1960, 1963; Pederson & Wender, 1968; Wallach & Kogan, 1965)

13. Category breadth (Bruner & Tajfel, 1961; Pettigrew, 1958; Wallach & Caron, 1959; Wallach & Kogan, 1965)

14. Creativity (Crutchfield, 1966; Getzels & Jackson, 1962; Jackson & Messick, 1965; Kogan & Morgan, 1969, in press; Pankove & Kogan, 1968; Wallach & Kogan, 1965; Ward, 1968b, in press)

15. Cognitive complexity (Bieri, 1961; Bieri et al, 1966; Kelly, 1955; Messick & Kogan, 1966; Scott, 1963; Tripodi & Bieri, 1966; Vannoy, 1965)

16. Habituation (Kagan & Lewis, 1965; Lewis & Goldberg, in press a; Lewis, Kagan, & Kalafat, 1966)

(Continued)

Table D.3 (Continued)

17. Distractibility (Broadbent, 1958; Broverman, 1960a; Maccoby & Konrad, 1966)

18. Amount of attention (Kagan & Lewis, 1965; Lewis & Goldberg, in press b; Lewis, Kagan, & Kalafat, 1966)

19. Perception of affect (Feshbach & Roe, 1968; Heider, 1958; Izard & Nunnally, 1965; Tomkins & McCarter, 1964)

20. Perception of conflict (Berlyne, 1960; Festinger, 1957; Tripodi & Bieri, 1966)

21. Planfulness (Guilford & Lacey, 1947)

22. Vulnerability to frustration (Dollard et al, 1939; Endsley, 1967; Murphy, 1964; Zigler & Butterfield, 1968)

23. Defenses (Freud, 1965; Gardner & Moriarty, 1968; Miller & Swanson, 1966; Shapiro, 1965)

24. Coping styles (Freud, 1965; Haan, 1963; Hertzig et al, 1968; Moriarty, 1961; Murphy, 1962)

Attitudes and interests.* An attitude is here defined as an implicit, evaluative, drive and cue producing response made to socially significant elements in the individual's environment. This definition is substantially in accord with definitions presented in general psychology textbooks (Travers, 1967; Kagan & Havemann, 1968) and in technical journal articles (Doob, 1947; Rhine, 1958). A further conceptual elaboration of an attitude is provided by Rosenberg and Hovland (1960). They argue that the implicit (attitudinal) response has both an affective and cognitive component. Given the validity of the definition and of this further elaboration, it can be seen that a number of different indirect measurements of an attitude can be attempted. This point of view is put forward by Green (1954). He argues that the attitude may be observed in one of three ways: elicited verbal behavior, spontaneous verbal behavior, or actual overt behavior.

While the conceptualization and operational definition of attitudes have been relatively well developed, less attention has been paid to mapping and organizing the attitudinal domain. In this respect there is kinship with the area of learning, in which a number of classifications of learning theories and processes have been attempted but where few attempts have been made to provide a taxonomy of learning tasks. Thus, while there are available a number of approaches to the measurement of attitudes there is no available guide, save subjective judgment, as to which attitudes one might attempt to measure. In most research this lack is not important. If one were interested in the effects on students of providing mathematics instruction by television, an important dependent variable would be attitudinal and it would not require great cognitive effort to decide which attitudinal areas one might wish to include in a measuring instrument. However, in a comprehensive longitudinal study it becomes important to specify the major, important attitudinal areas in order to ensure that omissions in the final battery have been intentional and not matters of oversight.

In our attempt to provide a comprehensive mapping of the attitudinal domain a primary concern is to provide a means of categorizing the socially significant elements in an individual's environment. A subsequent concern is to provide each category with sufficient elements as to give it definitional validity. Our attempt is schematically presented as Figure D.2.

Interests may be thought of as the manifestations of an attitude in the context of an individual's activities. Interests may be defined in terms of the activities an individual chooses to engage in or activities for which an individual expresses preference (Travers, 1967a). Presumably underlying an interest is an attitude toward a task or set of tasks. Thus, an interest reflects attitudes in the task area presented in Figure D.2.

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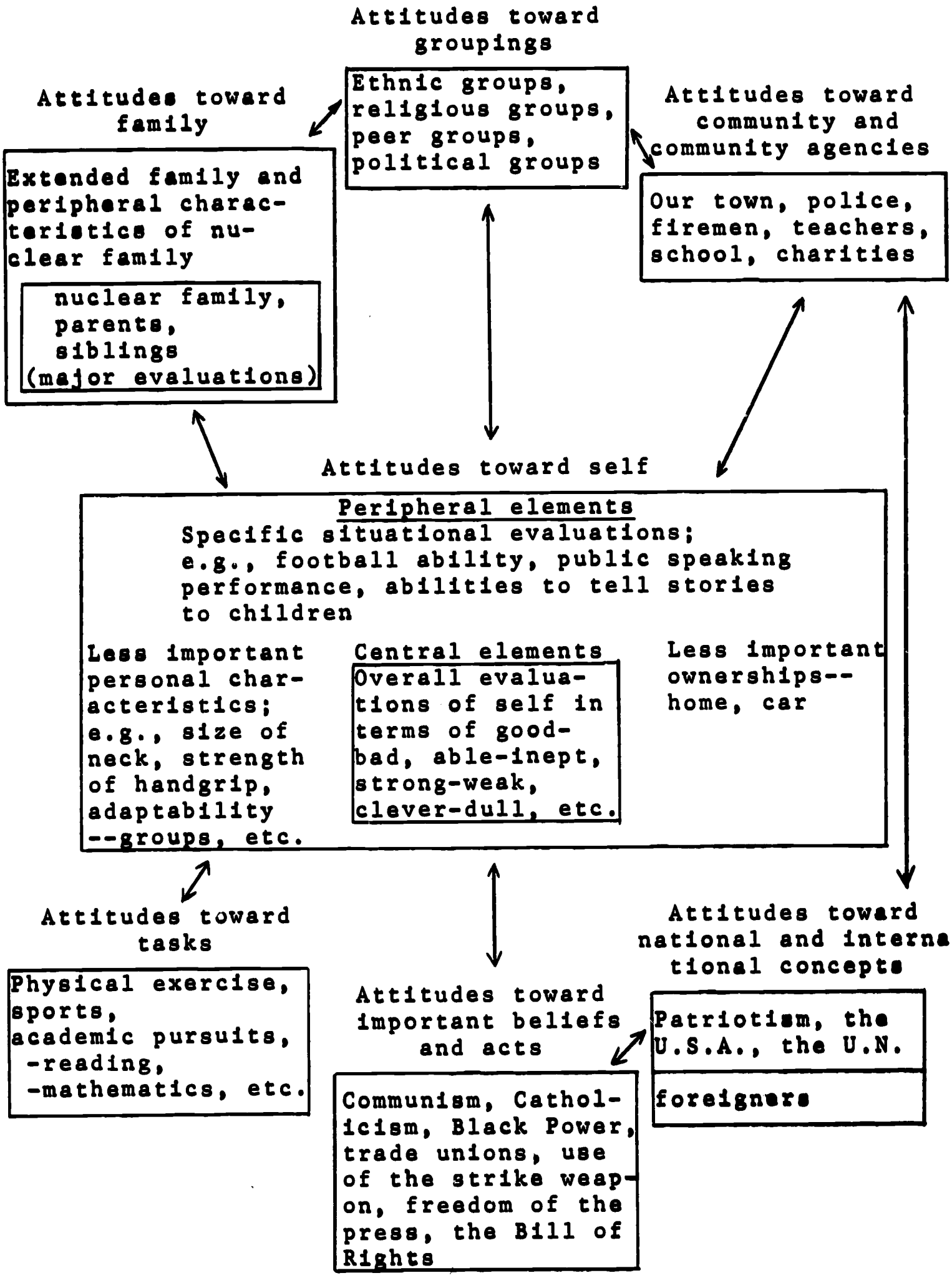
*This section was written by Samuel Ball and Karla Goldman.

Figure D.2

THE ATTITUDINAL DOMAIN

A Categorization of Socially Significant Elements in an Individual's Environment



Children's interest is a much neglected area with only sporadic study. The classic work is probably Lehman and Witty's The Psychology of Play Activities (1927). For utilitarian purposes, research on interests has focused on adolescents and adults to aid in vocational and educational planning.

The only individual inventory designed for children in primary grades is the Northwestern University Interest Inventory developed by Witty and Kopel and modified by Witty (1960). This is a structured interview involving teacher-pupil discussions of hobbies, leisure activities, play preferences, reading interests, radio/movie/television habits, and also questions relating to the child's personal and social problems. Although this method overcomes some of the difficulties for young children involved in questionnaires, logs, and anecdotal records, it still must be remembered that children cannot show interest in things that they do not know. Limited knowledge or experience must not be mistaken for lack of interest (Anastasi, 1968). As noted by Sutton-Smith and Rosenberg (1961), one must also look at the generational changes over time.

The importance of sex differences in children's interests, which seem to increase with age, is discussed by Terman and Tyler (in Carmichael, 1954), and also by Lehman and Witty (1927), Witty (1960), Hughes (1955), and Farwell (1930). Equally important is the developmental process. Piaget indicates that as a child grows older, his play becomes more integrated and goal-directed. Similarly, Russell (1956) explains how the preschool child develops from solitary play to parallel play to a few beginnings of social play. Probably because of school influence, after six years both cooperative and competitive activities enter into play situations.

An area of increasing importance is children's television interests. Witty (1960) found that in 1959 elementary school pupils watched an average of 21 hours of TV per week. Again it must be remembered that there are generational changes in interests and also changes in TV fare. Additional significant work in this area has been done by Maccoby (1954) and Klapper (1960).

Using these sundry pieces of research, an attempt has been made to formulate a taxonomy of children's interests for use with preschool and primary grade pupils. It relies heavily on one designed by Gesell (1946) with modifications based on the literature cited above. This taxonomy is found in Appendix b.2.

Measurement Strategies*

Developmental considerations. For several reasons, the child's developmental status takes on special significance for the measurement of personal-social characteristics. Obviously there are intrinsic limitations in the younger child's capacities, and these limitations place constraints upon the kinds of contextual variations that might be sampled. For example, it is extremely difficult to ask the child to make verbal appraisals (A-1) before he has developed the requisite vocabulary and understanding of the referents of the question. Moreover, child psychologists typically have sampled children at certain ages using the criterion of convenience in measuring the psychological function of interest, rather than attempting to monitor the development of the function itself longitudinally for the purpose of discovering its early manifestations or precursors. Consequently, many gaps exist in instrumentation for important variables, especially at early ages. Finally, while it might be desirable to sample certain contexts at many age periods, it may also be impractical to do so. For example, while some teachers might be able to provide appraisals of children's behavior in their homes, it seems unlikely that most teachers will have had sufficient access to the homes to make such appraisals worthwhile.

In order to explicate some of these contextual variations in relation to child age we have drawn up a tentative listing, found in Appendix b.3.

The strategic problem arising from these developmental considerations is one of maintaining continuity of measurement across age periods so that any empirically found discontinuities in behavior might be attributed to changes in children, rather than to changes in context. This principle leads to the following two guidelines for measurement: (a) whenever possible, personal social variables should be appraised in the same context at each age period; (b) when contextual shifts cannot be avoided, it is desirable to minimize the number of shifting contextual dimensions; e.g., a shift from trained observer to teacher in judging child classroom behavior is preferable to a shift from trained observer in the classroom to parent in the home.

However, there may also be certain contexts in which measurement is both easy and inexpensive, even though such contexts are discontinuous across age periods. Often it is desirable to include these special cases of measurement because multiple assessments of the same variable provides a basis for construct validation, at least with respect to the construct's meaning within a specific developmental period.

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*Samuel Ball assisted in the preparation of this section.

It should also be noted that the behavioral variables themselves are likely to shift developmentally in how they are expressed (e.g., Emmerich, 1966a, 1968; Kagan & Moss, 1962). Thus, a third guideline for measurement is that of selecting multiple measures of the same variable (within a context) across several age periods so that such changing forms might be monitored. Such a strategy is followed explicitly with respect to the assessment of social motives (see Emmerich's working paper, OEO Interim Report, February, 1968).

With respect to the measurement of attitudes and interests, a fine historical account is available in a number of places (Secord & Backman, 1964; Jackson & Messick, 1967). Clearly, attitude and interest measurement was reaching a relatively sophisticated stage forty years ago (Thurstone, 1928), with the Likert model coming soon afterwards (Likert, 1932). While there have been considerable developments since then in terms of overcoming methodological problems, a neglected area has been the measurement of attitudes and interests in preschool children. It needs no documentation to assert confidently that these children have some well established attitudes and interests. Inferences from their observed behavior confirm this. However, the conventional measuring instrument demands a self-report often using the tools of pencil and paper. Such a technique for measuring preschool children's attitudes can hardly be expected to be fruitful.

Measuring instruments for young children can make the simple demand that the respondent make a choice, indicating this choice by a physical response such as pointing (Johnson & Bommarito, undated).

Before proceeding with the presentation of specific attitude and interest measuring techniques to be used with young children, a major question requiring attention is what areas of the attitude domain are relevant to this age level. We know that very young children are basically egocentric and that, as they develop, their sphere of contact widens. Fragmentary self-percepts at the infancy stage are probably the earliest precursors to an adult's attitude and interest domain. During the early years, he develops attitudes toward himself and toward those people, objects, and events that are part of his immediate environment. It would make sense, therefore, to study, initially, aspects of the child's attitudes toward self and family and interests in tasks with which he has had experience. As the child enters a school setting, his attitudes toward school and his teacher and his interests in school activities would also be included in the battery.

An additional criterion in selecting elements to be measured in this domain is overall social relevance. Attitude toward race is an example of an area with high priority in this regard. It is important that we discover, if possible, the

genesis and the course of development of racial attitudes. Therefore, a measure of attitude toward race will be included in the attitude batteries to be administered to the youngest children.

Subdomain x variable x measure x context tables. The above considerations have been used as a guide in this study for selecting from the full array of personal-social variables (Tables D.1-D.3) and measurement contexts (Appendix b). In order to tie these fuller mappings of variables and contexts to the actual measures of the study, there follows a series of subdomain x variable x measure x context tables (D.5-D.11). To recapitulate, the translation of potential variables into actual measures took account of the following: (1) capacity limitations in young children; (2) state-of-the-art in measure development; (3) minimization of developmental shifts in context; (4) age variations in behavorial manifestations of underlying constructs; (5) implementation of multiple measurement of the same construct within age periods when feasible; (6) variable selection on the basis of salience for the population to be studied.

Table D.5

GENERAL PERSONALITY CHARACTERISTICS

Subdomain x Variable x Measure x Context Matrix I

Subdomain	Variable	Measures	Contexts*		
General Personality Characteristics (Level 3)	22 Bipolar Traits (See Table D.1)	Ratings (See Appendix b)	3 1/2	(A4B1,4,6,7C2)	(A6B1,4,6,7C2D2) (A5B5C4)
			4 1/2	↓	↓ ↓
			K	↓	↓ ↓
			1	↓	(A1,7,8,10C2) ↓
			2	↓	↓ ↓
			3	↓	↓ ↓

*In this and subsequent Tables D.6-D.10, context codes are those found in Figure D.1. For convenience, these codes are reproduced here:

A. Who makes the appraisal?
1. Target child
2. Mother
3. Father
4. Teacher
5. Tester
6. Trained observer
7. Female peer
8. Male peer
9. Sibling
10. Group

B. Object of child's response.
1. Self
2. Mother
3. Father
4. Teacher
5. Tester
6. Female peer
7. Male peer
8. Sibling
9. Group
10. Concept (attitude)
11. Others

C. In what setting does the behavior occur?
1. Home
2. Classroom
3. School, non-classroom
4. Test situation
5. Community (other)

D. How structured is the context?
1. Formal, structured
2. Informal, unstructured

E. What is the affective "pull" of the setting?
1. Positive
2. Neutral
3. Threatening

F. Age when assessment occurs.
3 1/2
4 1/2
K
1st grade
2nd grade
3rd grade

Table D.6

SOCIAL MOTIVES ASSESSED BY MEANS OF RATINGS

Subdomain x Variable x Measure x Context Matrix II

Subdomain	Variable	Measures (Number references are to Appendix b: Unipolar Traits)	Contexts		
			3 1/2	(A4B1,4,6,7C2)	(A6B1,4,6,7C2D2)	(A5B5C4)
Social Motives	Abasement	41, 47, 83	4 1/2	↓	↓	↓
	Achievement	7, 8, 9, 19, 20, 26, 41, 52, 53, 54; Head Start Inventory; Modified Hertzig	K	↓	↓	↓
	Affiliation	21, 22, 23, 53	1	↓	(A1,7,8,10C2)	↓
	Aggression	13, 42, 43, 44, 45, 46, 47, 84, 85, 89	2	↓	↓	↓
	Anxiety	70, 71, 72, 73, 74, 81	3	↓	↓	↓
	Autonomy-independence	35, 36, 37, 38, 39, 40				
	Curiosity	18, 48, 49, 50				
	Defendence	80-91				
	Deference	15, 27				
	Dependency (Attachment)	1, 2, 88; Head Start Inventory; Modified Hertzig				
	Dependency (Instrumental)	3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 14, 50				
	Dominance	25				
	Nurturance	18, 19, 24, 54				

Table D.7

SOCIAL MOTIVES ASSESSED BY SPECIALIZED INSTRUMENTS

Subdomain x Variable x Measure x Context Matrix III

Subdomain	Variable	Measures	Context
Social Motives	Abasement	Social Schemata; Open Field; Gumpgookies; Brown IDS; Mother-Child	3 1/2 (A5,6C4D1,2E1,2)
			4 1/2
	Achievement	Open Field; Brown IDS; Gumpgookies; Mother-Child	K
			1
			2
	Affiliation	Social Schemata; Mother-Child; Sociometric; Brown IDS	3
	Aggression	Open Field; Mother-Child	
	Anxiety	Open Field; Mother-Child; Brown IDS	
	Autonomy-independence	Open Field; Mother-Child; Gumpgookies	
	Curiosity	Open Field	
	Defendence		
	Deference	Open Field; Mother-Child	
	Dependency (Attachment)	Open Field; Brown IDS; Mother-Child	
	Dependency (Instrumental)	Open Field; Brown IDS; Mother-Child	
	Dominance	Open Field; Mother-Child	
	Nurturance	Open Field; Mother-Child	

Table D.8

CONTROLLING MECHANISMS ASSESSED BY RATINGS

Subdomain x Variable x Measure x Context Matrix IV

Subdomain	Variable	Measures (Number references are to Appendix b: Unipolar Traits)	Contexts
Controlling Mechanisms	Tolerance for delay of reward	69	3 1/2 (A4C2) (A6C2D2) (A5B5C4) 4 1/2 K 1 2 3
	Distractibility	38; Head Start Inventory; Modified Hertzig	
	Habituation	60	
	Amount of attention	39, 40, 61, 62; Head Start Inventory	
	Planfulness	63, 64, 65, 66, 67	
	Vulnerability to frustration	78, 79; Head Start Inventory	
	Coping styles	80-91	
	Impulse control	Head Start Inventory	

Table D.9

CONTROLLING MECHANISMS ASSESSED BY SPECIALIZED INSTRUMENTS

Subdomain x Variable x Measure x Context Matrix V

Variable	Measure	Contexts (All are A5C4) 3 1/2	4 1/2	K	1	2	3
1. Leveling-sharpening							
2. Scanning-focussing							
3. Field articulation	Preschool Embedded Figure Test	X	X	X			
	Children's Embedded Figures Test				X	X	X
	Portable Rod-and-Frame Test			X	X	X	X
4. Constricted-flexible control	Fruit Distraction Test			X	X	X	
	Stroop Color-Word Interference Task					X	X
5. Tolerance for unrealistic experience							
6. Conceptual differentiation							
7. Tolerance for delay of reward	Mischel Technique	X	X	X	X	X	X
8. Internal-external locus of control	I-E Scale		X	X	X	X	X
9. Risk-taking strategy	Risk-Taking Tasks	X	X	X	X	X	X
10. Impulsivity-reflectivity	Matching Familiar Figures Test	X	X	X	X	X	X
11. Impulse control	Motor Inhibition Test	X	X	X	X	X	X
12. Classificatory style	Sigel Conceptual Style Task	X	X	X	X	X	X
13. Category breadth							
14. Creativity	Open Field Test	X	X	X	X	X	X
	Naming Category Instances		X	X			
	Ideational Fluency Tests			X	X	X	X
	Uses Test	X	X	X	X	X	X
	TAMA Tell-a-Story Task	X	X	X	X	X	X
	Children's Drawings			X	X	X	X

(continued)

Table D.9 (continued)

Variable	Measure	Contexts (All are A5C4) 3 1/2	4 1/2	K	1	2	3
15. Cognitive complexity	Kreitler Cognitive Orientation		X	X	X	X	X
16. Distractibility	Fruit Distraction Test			X	X	X	
	Head Start Inventory	X	X	X	X	X	X
	Open Field Test	X	X	X	X	X	X
	Stroop Color-Word Interference Test					X	X
17. Habituation	Fixation Time	X	X	X	X	X	X
	Open Field Test	X	X	X	X	X	X
18. Amount of attention	Fixation Time	X	X	X	X	X	X
	Open Field Test	X	X	X	X	X	X
	Relevant Redundant Cue Concept Task		X	X	X	X	X
	Mother-Child	X	X	X	X	X	X
19. Perception of affect	Brown IDS	X	X	X	X	X	X
20. Perception of conflict							
21. Planfulness	Open Field Test	X	X	X	X	X	X
22. Vulnerability to frustration	Kreitler Cognitive Orientation		X	X	X	X	X
	Open Field Test	X	X	X	X	X	X
	Mother-Child	X	X	X	X	X	X
23. Defenses							
24. Coping styles	Open Field Test	X	X	X	X	X	X
	Mother-Child	X	X	X	X	X	X

Table D.10

ATTITUDES

Subdomain x Variable x Measure x Context Matrix VI

Subdomain	Variable (Object)	Measure	Contexts (All are A1,B1-10,C1-5) 3 1/2	4 1/2	K	1	2	3
Attitudes	Self esteem	Social Schemata		X	X	X	X	X
		Gumpgookies		X	X	X	X	X
		Brown IDS	X	X	X	X	X	X
	Race	Social Schemata		X	X	X	X	X
	Mother	Social Schemata		X	X	X	X	X
		Gumpgookies (modified)		X	X	X	X	X
	Father	Social Schemata		X	X	X	X	X
		Gumpgookies (modified)		X	X	X	X	X
	Girls	Social Schemata		X	X	X	X	X
		Gumpgookies (modified)		X	X	X	X	X
	Boys	Social Schemata		X	X	X	X	X
		Gumpgookies (modified)		X	X	X	X	X
	Home & family	Social Schemata		X	X	X	X	X
	Teacher	Social Schemata		X	X	X	X	X
		Gumpgookies		X	X	X	X	X
	School	Social Schemata		X	X	X	X	X
		Gumpgookies		X	X	X	X	X
	Community					X	X	X
	Belief systems	Gumpgookies (limited set)		X	X	X	X	X

Table D.11

INTERESTS

Subdomain x Variable x Measure x Context Matrix VI

Subdomain	Variable	Measure		Context	(A6C2D2)
Interests	Gross motor activity	Rating 29	3 1/2	(A4C2)	↓
	Fine manipulative activity	" 30	4 1/2	↓	
	Cognitive activity	" 31	K		
	Fantasy activity	" 32	1		
	Artistic activity	" 33	2		
			3		
	Fantasy materials	PROSE 9-1	3 1/2	(A6 C2D1,2)	
	Divergent materials	" 9-2	4 1/2	↓	
	Convergent materials	" 9-3	K		
	Kinesthetic materials	" 9-4	1		
	Actual materials or topic (Art, Dolls, Science, etc.)	PROSE	2		
			3		
	Free Play Object Preferences	Open Field Test	3 1/2	(A6C4D2)	
			4 1/2	↓	
			K		
			1		
			2		
			3		
	Reading content	Adaptation of Northwestern University Interest Inventory	3 1/2		
			4 1/2		
			K	(A1,4B1C1,2,3,5)	
			1	↓	
			2		
			3		
	Educational/Academic (numerical, social studies, science, writing)	"	3 1/2		
			4 1/2		
			K	(A1,4B1C1,2,3,5)	
			1	↓	
			2		
			3		
	General interests (hobbies, pastimes, sports)	"	3 1/2		
			4 1/2		
			K	(A1,4B1C1,2,3,5)	
			1	↓	
			2		
			3		

E. CHILDREN'S PHYSICAL HEALTH AND NUTRITIONAL STATUS

General Considerations

Edmund W. Gordon

The tendency in educational research to concentrate on the pedagogical, psychological, and social development of children is understandable and appropriate to the primary concerns of educators. There is some indication, however, that these emphases have resulted in the neglect of problems related to health and nutritional status as codeterminants of the quality of intellective and social development in children. The high incidence of suspect conditions referable to health and nutritional status in economically disadvantaged populations requires that educational research conducted on these groups give more sensitive attention to problems and relationships in this area.

Available research provides considerable evidence of a variety of behaviors and conditions which are encountered in children from economically deprived backgrounds with sufficient frequency to justify the conclusion that they are either induced or nurtured by poverty. The studies by Pasamanick and Knobloch (1958) of the relationship between health status and school adjustment in low income Negro children, by Lashof on health status and services in Chicago's southside, by Porter (1965) of the health status of a sample drawn from the Head Start population, and by Cravioto, DeLicardie, and Birch (1966) of health and nutrition in relation to development in a South American population provide mounting evidence in support of the hypothesis that there exists a continuum of reproductive errors and developmental defects significantly influenced by level of income. According to this hypothesis the incidence of reproductive error or developmental defect occurs along a continuum in which the incidence of error or defect is greatest in the population for which medical, nutritional, and child care are poorest, and the incidence least where such care is best.

These studies point clearly to the facts that, for lower class families:

1. nutritional resources for the mother-to-be, the pregnant mother and fetus, and the child she bears are inadequate;
2. medical care--prenatal, obstetrical, and postnatal--is generally poor;
3. the incidence of subtle to more severe neurologic defects is relatively high in low-income children;
4. case finding, lacking systematic procedures, is hit or miss, leaving the child not only handicapped by the disorder, but frequently with no official awareness that the condition exists;
5. family resources and sophistication are insufficient to provide the remedial and/or compensatory supports

which can spell the difference between handicap and competent function.

These health-related conditions are thought to have important implications for school and general social adjustment. We know that impaired health or organic dysfunction influences school attendance, learning efficiency, developmental rate, personality development, etc. Pasamanick and Knobloch (1958) attribute a substantial portion of the behavior disorders noted in this population to the high incidence of subtle neurologic disorders. Silver and Hagin (1967) relate a variety of specific learning disabilities to mild-to-severe neurologic abnormalities in children. Some studies have shown a relationship between frequent or chronic illnesses and poor school achievement. Clearly, adequacy of health status and adequacy of health care are directly related to adequacy of development and adequacy of function. Equally as clearly we see that adequacy of health status and health care in our society is influenced by adequacy of income, leading to the obvious conclusion that poverty results in a number of conditions directly referable to health and indirectly to development in general.

Etiologic relationships between income and intellectual status or intellectual function are not as readily established as those between health status and income. Yet, there is an overwhelming body of correlational data which shows income level to be the best single predictor of group intellectual functioning. The Sexton study (1961) of the relationship of income level to educational opportunity and achievement in a United States metropolis, studies of income and reading level, and to some extent the recently released national study of Equality of Educational Opportunity in the United States by Coleman (1966) call our attention to the fact that regardless of other variables along which the populations may be grouped, poor people in this country do less well than rich people on tests of intelligence and academic achievement. These correlational data may not be used to establish causation; yet shifts in group and individual scores as living standards improve or as stimulational circumstances are enhanced, as well as the overlap in scores between subjects in the extremes of these two groups, lend support to the assumption that biological factors, incidentally associated with income groups or directly associated with ethnic stock, are insufficient to account for the observed differential function. When we look at studies of quality of educational input and the distribution of such inputs along levels of economic status, we begin to find compelling evidence in support of the assumption that differential intellectual function is influenced by quality of educational exposure which in turn is influenced by income level, with poverty being positively associated with low level function, as well as low level quality of education. It is the confounding of income level, physical factors, and quality of educational experience which makes the systematic investigation of health and nutritional factors an essential part of this study.

Table E.1

PHYSICAL STATUS IN RELATION TO INTELLECTUAL AND SOCIAL FUNCTION

Physical Status

1. Gross Physical Status
   a. Age, height, weight, discrepancies determined according to Wetzel (1943)
   b. Estimates of physical intactness
   c. Estimates of nutritional status
   d. Estimates of energy level
2. Family and Personal Health History
   a. Health history of mother during pregnancy
   b. Birth history, including Apgar score
   c. Neonatal and developmental history
   d. Estimates of food intake--amount and kind
   e. Major illnesses
   f. Chronic conditions
   g. Childhood diseases
   h. Episodic critical illnesses
   i. Recurrent debilitating illnesses
3. Present Health Status
   a. Physical disabilities (motor and sensory)
   b. Cardiac function
   c. Hematocrit level
   d. Hemoglobin level
   e. Metabolic disorders
   f. Neurologic disorders
4. Psycho-Social Medical Status
   a. Reactions to typical childhood illnesses: parent, child, teacher
   b. Reactions to major debilitating illnesses, if present: parent, child teacher
      Compensatory measures, supportive environmental factors
      Temporal relationship to social-emotional factors

Intellectual and Social Function

1. Achievement
2. Intelligence Level
3. Personal and Social Development
4. Emotic al Maturity
5. Reaction Tendencies
   a. Reaction time
   b. Attention
   c. Energy level

The rationale for the investigation of health and nutritional factors in this study is multifaceted. We are concerned with the development of baseline data on the physical status of this population of children and with documenting their physical development over the time interval covered by the study. We are concerned with describing the dimensions of health and nutritional problems and needs for this group as a sample of disadvantaged children. We seek to investigate the utilization of health services and nutritional resources. We seek to better understand the relationships between physical function, health and nutritional status on the one hand, and affective and cognitive development on the other.

It is, in a sense, immoral to invest time and resources in the study of these questions rather than in the correction of health problems and the provision of health services. We know without a single investigation that it is better to be healthy and well-fed than to be ill and malnourished. We do not turn to investigate this area in order to justify service; rather, it is to better understand mechanisms and relationships in human development and learning and to gain insights referable to the improvement of health care and educational achievement. Data collection will be directed at the determination of relationships between certain aspects of physical status and certain aspects of intellectual and social functions, as in Table E.1.

Although the major justification for the collection of physical status data derives from the research questions posed, it is considered inappropriate to move into this area without some concern for medical care. A number of the procedures may have relatively low research information pay off, but are standard and considered necessary to the determination of health status and medical service needs. For example, blood analyses will be conducted to determine hematocrit level as an index to anemia. It is not expected that these levels will show any interpretable relationship to intellectual function since there appears to be a high degree of tolerance to iron deficiency before it is reflected in impaired intellectual function. Nonetheless, the determinations will be used to refer anemic children for indicated service. Thus, the medical examination will include procedures productive of more data than the research questions demand. For purposes of research, primary attention will be given to those physical status variables which are considered to have relevance for intellectual or social development. Emphasis will be given to abnormal conditions and dysfunctional states which interfere with sequential development or developmental achievement.

Table E.2

PHYSICAL MEASUREMENT

Data Required	Source of Data			Agent for Collection		
	Child	Parent	Teacher	Medical	Paramedic	Interviewer-Aide
Family medical background: hereditary disorders, chronic disorders, present state of health, nutrition & food habits		X				X
Conditions of birth: prenatal care & health, parturition, medical attendance		X				X*
Child's medical background: health history, nutrition & eating habits		X				X
Child's typical behaviors, including evidence of energy & stamina	X	X	X			X
Reaction to major debilitating diseases: compensatory accommodations, related changes in behavior		X	X			X
Present health status, ancillary information:						
vision screening	X			X		
auditory screening	X				X	
child's statistics--height, weight, pulse, etc.	X				X	
blood analysis--evidence of anemia, latent infection	X				X	
urinalysis--evidence of infection, diabetes, renal disorders	X				X	
Present health status, medical examination: routine physical examination	X			X		
Present health status, overall appraisal: estimate of physical integration, recommendations	X	X	X	X		

*Apgar score if hospital records are available

Examination and Measurement

George Gordon, Charles Allen, Irwin Hyman, Carl Schultheis, and Arthur Terr

In contrast to the other areas of the study, many of the techniques and instruments here are almost universally familiar to the appropriate practitioners, and the same procedures are appropriate for all the ages under study. The procedures are categorized in four major activities: collection of medical history (family and subject), collection of ancillary medical information, physical examination, medical appraisal and recommendations. (See Table E.2.)

Special Notes

Vision screening. The purpose of the vision screening procedure will be to detect those children who have potential or actual vision problems that may affect scholastic or social development. Attempts will be made to detect those vision problems which include poor visual acuity for any working distance, any significant refractive error, and disturbances in binocular vision and/or coordination of the eyes. Examinations will also be made to detect those vision problems which are organic in nature, including pathologies and anomalies of the eye, adnexa, and impaired visual pathway and neuromuscular mechanism. A copy of the examination form is included in Appendix c. The examination permits only gross measurement; suspect cases should be referred to appropriate agencies.

Auditory screening. The audiogical examination will consist of screening by air conduction at 20 decibels (db) or above, depending upon ambient noise conditions. The frequencies tested will be 500, 1000, 2000, 4000, and 6000 cycles per second (Herz). If sufficiently soundproof facilities can be obtained, bone conduction will be tested at 500, 1000, 2000, and 4000 cycles per second (Herz).

The method of conducting the auditory screening involves the use of textile cones as a type of building block. The child is instructed to place another cone on the pile whenever he feels a vibration through a bone conduction oscillator placed in the palm of his hand. After the child consistently responds to felt vibrations, the tones are presented at suprathreshold level until it is evident that the expected responses are obtained. Responses at 20 db are then obtained without any change in instruction.

In a pretest, the method seemed to be appropriate insofar as most children approached the task eagerly and responded consistently. Of a total of 132 Head Start children screened, only seven could not be rapidly conditioned by this procedure.

Physical examination. A routine physical examination will be conducted by a doctor of medicine, preferably after all other pertinent information is available. This will include a neurologic examination.

Medical appraisal and recommendations. Each examination will result in a report of findings, a general estimate of physical integration, and a physical profile.

The primary objective of the measurement of physical status is the identification of variables that are associated with educational development (see Table E.1). Because of the general importance of health and physical well-being, the data to be collected has been expanded somewhat in the interests of providing a service to the study participants. However, this should not be considered a comprehensive medical examination since many otherwise important--and often routine--measures will not be taken; e.g., chest X-ray.

F. THE IMPACT OF THE FAMILY

Virginia C. Shipman and Anne M. Bussis

A. General Rationale

The relationship between family variables and children's development has long been the subject of theoretical speculation --from both hereditary and environmentalist points of view. Regardless of theoretical orientation, however, the existence of such relationships in the social, emotional, and cognitive domains is well documented by empirical evidence. Until very recently, the focus of such research has been upon those aspects of child-rearing that are related to personality development and social adjustment (see Kagan & Moss, 1961; Peck & Richek, 1964; and Sears, Maccoby, & Levin, 1957). More germane to the present study is the question of what kinds of variables are most critically related to emerging developmental patterns in the child, particularly to those intellectual characteristics and styles which will effect the competency of his functioning in school.

In measuring aspects of the environment which correlate with the growth of intelligence and academic achievement, Wolf (1964) and Dave (1963) distinguish between status and process variables. Simply stated, this is the distinction between what parents are (e.g., ethnic membership, occupational-educational level) and what they do (e.g., styles of interaction with the child and aspirations held for him). The usual measures of socioeconomic level constitute a cluster of status characteristics and these typically correlate in the neighborhood of .40 to .50 with measures of intelligence and achievement in heterogeneous populations (Bloom, 1964). In the Wolf and Dave studies which are summarized by Bloom (1964), much higher correlations than the typical level were obtained between process variables and measures of intelligence and achievement (.76 and .80, respectively). While not all investigations have yielded such high coefficients, other studies have clearly confirmed the existence of consistent and significant relationships between family process variables and cognitive characteristics of the child--even in populations that are homogeneous with respect to socioeconomic level (Dyk & Witkin, 1965; Freeberg & Payne, 1967; Hess & Shipman, 1968; Solomon et al, 1967). Such data suggest that there is a great deal of variation in cognitive characteristics among children of the same social status and that there are many notable exceptions to the "low status-low achievement" maxim. The occurrence of this variability is also in accord with Zigler's (1968) general conclusion of greater differences in child rearing practices within social status levels than between levels.

A basic confounding of status and process variables is frequently seen in the synonymous usage of "low socioeconomic" and "culturally disadvantaged"--an indiscriminate interchange

of terms which neglects the wide variations in social atmosphere and personal interaction conducive to a child's progress toward typical middle class behaviors. It is hoped that this study will provide a better operational definition of cultural disadvantage based upon home environment factors directly related to the educational outcomes of deprivation.

Demonstrated correlational significance is not the only factor to consider in deciding what kinds of variables to investigate. Theoretical utility is also important. Although certain status-related variables (e.g., those concerned with the child's physical surroundings) provide an opportunity for theoretical formulation of <u>how</u> the environment mediates experience in critical ways, it is primarily the process variables which are important in this respect (Baldwin, 1967; Bernstein, 1961; Cazden, 1966; Deutsch, 1963; Hess & Shipman, 1965, 1968a; Hunt, 1961). For reasons of empirical <u>and</u> theoretical significance, therefore, top priority will be given to process variables in this study. Information about situational and status characteristics will be obtained only insofar as these either (a) define important aspects of the child's psychological as well as physical environment, or (b) identify sub-populations which should be analyzed separately.

The need for a comprehensive conceptual framework in considering family process variables is both obvious and compelling, since an essential question for any investigation of development is <u>how</u> the environment mediates experience and with <u>what</u> specific consequences for the child. In the long run, the adequacy of a developmental theory must be judged by its potential to systematize the complex interrelationships between training conditions (environment) and level of development. The more generic the theory, the more diverse the developmental phenomena and "training conditions" that can be subsumed under it. For the purpose of maximizing this potential, we have borrowed heavily from the conceptualizations of Harvey, Hunt, and Schroder (1961) as an integrative framework.

Within this framework, development is viewed as progression along a general concrete-abstract dimension, from concrete and absolute concepts to increasingly abstract and relativistic concepts. In other words, it is concerned with a structural dimension which cuts across content lines and is therefore applicable to many areas of development. As stated by Harvey, Hunt, and Schroder (1961)

> We assume that the principles of development described apply to a fairly broad range of developmental phenomena: child development, development of groups, concept development, development of complex skills in education and the like. Thus, although we emphasize child development and speak of the developing organism we assume that the principles

> are fairly generic. As such, the work of Piaget (1954), Gesell (1956), Erikson (1956), Ausubel (1958), Sullivan (1953), Sullivan, Grant, and Grant (1957) in child development; Bennis and Shepard (1956), Martin and Hill (1957) in the development of small groups; .... Parsons (1955) in the development of cultures; and Freud (1938), Rotter (1954) and Rogers (1958) in the development of therapeutic relations are relevant to the present view. In short, the present treatment is seen as relevant to all forms of psychological development, viewed structurally (pp. 92-93).

Any given position along the concrete-abstract dimension is, in turn, determined by the nature of the individual's autonomy-dependence orientation. That is, by his orientation with respect to criteria which direct the interpretation of stimulus events and response patterns. Harvey, Hunt, and Schroder have identified four broad stages of autonomy-dependence orientation which may be applied to the development of any conceptual system--cognitive or social, complex or simple. (The rate of progression through these stages, however, is a function of environmental conditions, the nature and complexity of the system being developed, and the age of the learner.) In brief, these stages may be characterized as follows.

Stage 1 functioning represents greater dependence on the field and less articulation of the world. To the extent that a person is in a new situation--at the beginning of a developmental sequence--there is a lack of structure and minimum of concepts or programs for transforming stimuli into response systems. As such, concepts are undifferentiated and the person will be maximally sensitized to external controls. Rules are absolute and externally imposed, perceptions are concrete, and alternative interpretations are non-existent.

Stage 2 functioning represents the emergence of internal control and a gross differentiation of self from the external field. While alternative orderings of the world are not finely discriminated or based on realistic feedback from the environment, it is in this stage that the potential is developed to utilize conceptual orderings as tools. Functioning at this level is characterized by oppositional tendencies, the questioning of control, avoidance of dependence, and the testing of limits. In the realm of early cognitive development, these tendencies may be seen in the egocentric and animistic reasoning processes of the child. In Piaget's terms, the balance of cognitive activity is given to assimilating reality to existing cognitive structures rather than accomodating the structures to fit reality.

In Stage 3 the possibility of dependence again emerges, since the successful differentiation of self from the external field does not automatically mean a realistic independence from

the environment. It is only after such gross differentiation in Stage 2 occurs, however, that the person can realistically begin to articulate the external world and his relationship to it. Stage 3 functioning is therefore characterized by an "empirical attitude" and the "testing out" of alternate conceptual orderings. The individual begins to reorganize his concepts (internal causation) in order to experience the consequences of different problem solving strategies and alternative courses of action. At this stage, however, the person is still relatively dependent on the reactions of other people in evaluating the consequences of his behavior. Further progression depends upon the development of internal and informationally-based concepts for evaluating feedback from the environment (including the reactions of other people). Whether or not such internal evaluating concepts develop will, in turn, depend largely on the degree to which the environment protects the individual from failure and whether feedback about failure is presented in more direct and personal terms (experienced as loss of support) or in increasingly indirect and impersonal terms.

Stage 4 functioning is maximally abstract and may be described as the individual's maintaining an interdependent relationship with the environment. Not only is the person clearly differentiated from the field, but he is open to discrepant feedback from the environment (including other people) and can reorder and resynthesize articulated concepts as necessary.

It is evident from these brief "stage" descriptions that development is viewed here as a process of successive integration of one form of dependence and one form of independence or autonomy. The integrative process basically involves the following three-phase sequence: (1) clarity of the initial, more-or-less concrete, and non-conflicting concept at the beginning of each stage; (2) emergence of discrepant or conflicting differentiations; and (3) integration of the new and old differentiations into a more abstract conceptual schema. "In its most general form, then, progressive development involves the emergence of more abstract conceptual schemata for mediating these two (dependence-independence) basic orientations" (Harvey, Hunt, & Schroder, 1961).

It is, indeed, the very generality of this view that makes it useful, for it is a conceptualization that can be applied meaningfully to the development of self concept, interpersonal relationships, logical concrete operations, cognitive styles, or communication skills. As pointed out by the authors, however, individuals may vary considerably in their level of functioning in different areas. A child may be at a more abstract level of subject-object linkage to aspects of his physical environment (understanding conversation, for example) than to his social environment (peer acceptance, feelings of self worth, etc.). The observation of uneven development, even within rather closely related areas, has been made by other theorists as well (Piaget, 1950). The present study should permit investigation of the problem of specificity-generality of conceptual functioning across developmental areas.

Paralleling the notion of a general dimension of development is the notion of a general dimension of training or environmental conditions. It is a "general dimension" in the sense that it focuses on methods of training, not the specific content or goal of training. In other words, emphasis is placed on conditions which facilitate or inhibit the differentiation of autonomy-dependence poles at each stage of development. It should be noted that while this paradigm is given a dyadic structure in the following discussion, it is relevant also to general environmental conditions that facilitate or inhibit the development of groups (e.g., the family). This will be elaborated upon in the later discussions concerning the situational and status variables.

The most generic form of ordering training conditions in this manner is along a unilateral-interdependent dimension. The basic characteristics and hypothesized consequences at each end and at the midpoint of this dimension are presented in Table 1.

Further distinction between training conditions is made possible by referring to how control is imposed within the two poles of the general dimension presented in Table 1. Thus, a more specific dimension of reliable-unreliable imposition is relevant to unilateral training methods, while a protective-informational dimension is relevant to the imposition of interdependent training methods. These variations in imposition and their predicted effects may be briefly described as follows.

Reliable Unilateral Training: Under this condition, rewards and punishments are administered in a reliable manner. That is, behaviors outside the range of acceptance by the external source are consistently punished and behaviors inside the range are consistently rewarded. (It should be noted that this condition exists only for training within the ability limits of the person receiving training. If it is outside those limits, it will be experienced as similar to the unreliable unilateral condition.) The effect of such training is to maximize potential for arrested development at Stage 1.

Unreliable Unilateral Training: This condition may be produced by inconsistency of control or criterion specifications, inconsistency (or lack of) rewards and affectionate components in the training, or absolute expectations beyond the ability limits of the subject. In any case, the person is likely to experience frustration and failure, to view the world as directly or indirectly hostile, and to progress no farther than Stage 2 in his development.

Protective Interdependent Training: Variation in the protective-informational dimension can be seen in the way the training agent enters into the person's autonomous and instrumental activity. Under the protective condition, support is utilized both as a reward and as a way of guiding the instrumental activity--in particular to guide it away from a potential failure occurrence. Protection is in the form of subtle suggestion and intrinsic evaluation, embedded in a supportive relationship between training

Table F.1

CHARACTERISTICS AND CONSEQUENCES OF TRAINING CONDITIONS ALONG THE UNILATERAL-INTERDEPENDENT DIMENSION

----------Training Condition----------	Characteristics	Consequences
Unilateral Control (behavior manipulation)	1. External source determines absolute criterion for behavior. 2. Rewards and punishments directed toward these absolute and fixed goals. Rigidity, immediacy, and explicitness in way external source reacts to end product of subject's behavior. 3. Extrinsic evaluation - external source judges S's behavior in terms of how well responses match the criterion. 4. Exploratory or other activity tangential to the goal either ignored or punished.	1. Person learns to look externally for criteria of matching; to fit stimuli into absolute schemata. 2. Conceptual orientation based on external causation; rewards are absolute events over which he has no control. 3. Little differentiation between person and the source, since criteria for thoughts, wishes, and actions are largely synonomous with source who defines them.
Accelerated Autonomy (indifference - neglect)	1. Lack of source determination of criterion or standards. 2. Lack of environmental manipulation aimed at guiding instrumental behavior. 3. Absence of specific referent for defining rewards or punishments. Source's evaluation of person is non-specific and undifferentiated, not based on particular achievements or instrumental effort.	1. Environment is experienced as frustrating and directly hostile. 2. Development may be arrested at extremely primitive stage (autism) or at stage of negative independence.
Interdependent Control (environment manipulation)	1. Reality or relative determination of criteria for behavior. 2. Rewards directed mainly toward means and exploratory acts. 3. Intrinsic evaluation, source values subject as a person somewhat apart from the evaluation of his achievement against the criterion	1. Subject learns to utilize concepts as tools for informational appraisal, the goals of behavior not experienced as fixed and absolute. 2. Conceptual orientation based on internal causation. 3. Maximal differentiation between person and external sources.

agent and the subject. Failure, therefore, is not experienced as an objective, reality-oriented consequence of a particular behavior; it is rather "sensed" as rejection or lack of support. The effect of this condition is to maximize potential for arrested development at Stage 3.

Informational Interdependent Training: In this condition, the training agent explicitly directs approval toward instrumental accomplishments, but progressive barriers (within the child's coping limits) are not removed. Feedback from the source is not personal or indicative of personal evaluation, but maximizes the informational aspects of the environment. That is, the source enters as a reflecting agent to clarify the informational consequences of the subject's behavior. In early development, this type of training is obviously not very feasible until the child has acquired language and established patterns of communication. The effect of this condition is to maximize potential for progression to Stage 4.

Naturally, there are intermediate training methods which lie between the four basic orientations outlined here, but these are more difficult to assess within the Harvey, Hunt, and Schroder framework. (As discussed later, however, other recent investigations do provide specific hypotheses regarding critical variations in training.) What is important about the conceptualization presented here is its explicit assumption that functioning at a given developmental stage or level varies as a consequence of training method and its specific formulations of particular training effects. This framework is additionally significant for the following reasons: (1) it is relevant to both cognitive and social-emotional development; (2) it permits the description of mother and child by the same developmental terms in similar, though obviously not identical, content areas; and thereby (3) it generates specific testable hypotheses relating abstractness of mother's developmental level to mother's training techniques to abstractness of child's developmental level. Finally, the Harvey, Hunt, and Schroder theory is useful because it provides a compatible context for relating the growing volume of research on the pervasive behavioral effects of various cognitive styles and orientations.

While it is impossible to discuss this volume of research in detail, at least some of it should be mentioned. Bernstein (1961, 1964) and Hess and Shipman (1965, 1968a), for example, have formulated a comprehensive theory of maternal influence quite similar in basic ideas to the one presented here. More importantly, they have refined certain concepts and isolated critical variables which further characterize the communication and imposition of controls--e.g., the differentiation of alternative strategies via elaborated versus restricted language codes. Rotter, Seeman, and Liverant (1962) and Rotter (1966) have systematically investigated the antecedents and behavioral consequences of the "locus of control" variable (internal versus external control of reinforcements) and have related this to various

sociological formulations concerning alienation. Rokeach (1960) has explored "open" and "closed" belief systems and found them related to such things as ability to solve problems involving analysis and synthesis, ability to differentiate between contradictory beliefs or opinions, willingness to appreciate new aesthetic experiences, unquestioning acceptance of authority, and belief that the world is basically hostile. Dyk and Witkin (1965) have related the mother's cognitive style to specific training practices and child characteristics of field dependence-independence. In summary, all of this work seems to converge on similar constructs and variables.

B. Process Variables--Rationale and Candidates

In order to obtain information on the family that is most relevant to this set of conceptualizations, the following categories of process variables are proposed for inclusion in the study.

1. Feelings of Control over the Environment: Broadly speaking, this variable concerns the degree to which a person feels he can shape and direct his own future and the events which affect him. At one extreme, it is the conviction that one's actions make the decisive difference in life--and, conversely, that what happens is the result of one's own behavior. These beliefs have generally been referred to in the literature as locus of control (internal versus external) or sense of powerlessness. Whatever the rubic, the variable is of central importance to Harvey, Hunt, and Schroder's conceptualization, to Bernstein's theory, and to the work of Hess and Shipman and Rotter, mentioned above.

The behavioral correlates of such a belief are several. As summarized by Rotter (1966): "A series of studies provides strong support for the hypotheses that the individual who has a strong belief that he can control his own destiny is likely to (a) be more alert to those aspects of the environment which provide useful information for his future behavior; (b) take steps to improve his environmental condition; (c) place greater value on skill or achievement reinforcements and be generally more concerned with his ability, particularly his failures; and (d) be resistive to subtle attempts to influence him." Hess and Shipman (1968b) have found sense of powerlessness related to the greater use of restricted language codes, to the way in which a mother describes school to her child (as a place in which one must obey the teacher and follow the rules rather than as an opportunity for interaction and learning), to poorer teaching techniques, and to various child behaviors (e.g., lower Binet IQ, less initiative in the testing situation and lack of ease in relating to the examiner). In general, feelings of powerlessness are associated with looking externally to the environment for authoritative definitions of concepts and directives for behavior.

It should be pointed out that different investigators have studied this variable at different levels of generality as well as with different kinds of populations. The work of Rotter and his colleagues, for example, has been mainly with middle class

samples and on a very general plane--that is, with beliefs regarding control over a broad spectrum of world events, social conditions, and life achievements. Other investigators have focused on powerlessness with respect to more specific events and institutions (e.g., Shore, 1967, on child rearing; and Hess and Shipman, 1968b, on attitudes toward the school). In their assessment of powerlessness, moreover, the Hess and Shipman research dealt with low income families--many of whom are objectively restricted by environmental conditions in the opportunity to make decisions about how they will live and function. Because of such real life constraints, especially for families of minority status, it is expected that a greater proportion of subjects in this study will show external orientations than is true of typical middle class populations. Variation within our sample is also expected, however, and there may well be differential effects of an internal versus external orientation, depending upon the pervasiveness of the belief. In order to sample the locus of control variable at different levels of generality, the following item clusters are proposed for pretesting.

a. Generalized expectancies of internal versus external control.

   The Rotter scale, together with a more simplified language version of that scale, have been administered to a sample of lower class mothers. Wherever the data justify substitution, the simpler item will be used. Rotter items that have no apparent equivalent in the simplified version will be kept only if they were adequately understood by the mothers.

b. Powerlessness with respect to the school and local community conditions.

   New questions plus items from the Hess and Shipman Educational Attitude Survey are being pretested. Factor analyses of the Educational Attitude Survey based on data from several hundred low income mothers of four-year-olds have consistantly yielded a first factor which includes those items suggesting the uselessness of attempting to change either the educational system or the unruliness of children.

   The importance of this variable in relation to the impact of the community is elaborated upon in chapter J.

c. Child rearing control.

   Shore's Parental Questionnaire regarding perceived responsibility for a child's behavior and future success has been administered to a sample of lower class mothers. Items which prove meaningful will be retained for pretesting.

   Related to this factor is the mother's participation and involvement in activities with the child. Of special interest to the project are those activities

which are school supporting (e.g., reading to the child and helping with homework). The assumption being made is that taking such a role reflects the mother's feelings of competency and ability to effect changes in her child.

d. Aspirations versus actual expectancies for the child.

The discrepancy between aspirations and actual expectancies is conceived here as an indirect measure of the parent's feeling of influence in the child's life. Although it has been found that mothers of varying socioeconomic level differ little in expressed aspirations for their child's schooling--valuing education as an important tool for achieving better status in life--differences between aspirations and expectations tend to increase as social status decreases (Hess & Shipman, 1968b). Items from several questionnaires relating to educational-occupational aspirations and expected achievements are included for pretesting.

This study will provide an opportunity to investigate the mother's feeling of control over reinforcements not only in relation to similar feelings of her child, but also in relation to the community in which she resides. For example, as a ghetto becomes more organized, vocal, and effective in doing something about its problems, to what extent does the individual within that ghetto develop increasing expectancies of control over what happens to him? Similarly, where Head Start has provided the mother an active role in determining policies in the program, one would hypothesize increased feelings of efficacy in dealing with other situations. Miller (1968) has reported on the pervasive effects of the mother's growing self-confidence as a result of her participation in the DARCEE intervention project. Records kept by a home visitor over a two-and-one-half year period indicate changes in home management, changes in relationships within the family, higher aspirations held by parents for themselves and their children, and greater involvement in the community.

2. Attitude toward and Utilization of Community Resources (Participation versus Alienation): Closely related to the concept of internal versus external control is the sociological notion of alienation. While it is possible to distinguish several meanings of the term (e.g., see Rotter, Seeman, & Liverant, 1962), "alienation" is used here to mean a sense of futility, apathy, and general distrust with respect to social participation. It seems reasonable to hypothesize that such alienation would arrest development at a level of negative independence and lead to inconsistency of child rearing practices. At the very least, a mother's alienation from the community would serve to reduce her child's potential opportunities for cognitive stimulation. Support for this hypothesis comes from a study by Slaughter (1968) in which she found degree of social isolation of the mother a significant correlate of the child's level of school achievement. "Social isolation" was defined by Slaughter in terms of the

mother's utilization of available community resources. Similarly, Hess et al (1968) found, both for their total sample and for their lower class subjects alone, that the mother's degree of participation in organizations was significantly related to her four-year-old child's cognitive performance.

In this study we will investigate not only the effect of family participation-alienation on the child but, equally important, the effect of changing community conditions and resources on family involvement. Accordingly, several questions will be included which pertain to the family's (particularly the mother's) participation in community life--political organizations, community improvement projects, recreational and cultural resources, parent-teacher associations, groups concerned with school improvement, etc. Paralleling questions about actual participation will be some questions on the mother's perception of the effectiveness of these various groups and resources.

It is expected that those mothers who are less alienated will be more likely to send their children to Head Start--if for no other reason than that they are more likely to have heard about the program (see Chandler, 1966). Further, it is hypothesized that those families enrolled in a Head Start center where there is an active parent involvement program will become more knowledgable about the resources available in their community and utilize them to a greater extent. As alienation decreases, self-esteem should increase, with its attendant corollaries of more adequate functioning. This, in turn, would be expected to be reflected in the child's feelings of self-worth and his utilization of more effective coping strategies. We recognize, however, that there are many disorganized families, such as those so poignantly described in Families of the Slums (Minuchin et al, 1967), who would not be able to respond to these increased opportunities without appropriate support and more intensive help.

3. Control Techniques: Three types of family or maternal techniques for regulating and controlling the child have been identified and extensively investigated in the work of Hess and Shipman (1965, 1968a). These strategies differ primarily in the type of authority appeals made to the child. Status-normative control is characterized by demands for unquestioning obedience to an absolute authority--either the parents' by virtue of their status, or societal norms by virtue of tradition. The effect of this strategy is to discourage questioning and, indeed, to cut off thought and search for a rationale. The child is asked to attend to an uncomplicated message and to make a conditioned response (to comply); he is not called upon to reflect or to make mental discriminations. Moreover, the child learns to attend to authority figures as enforcers of rules. In the family, as in other social structures, control is exercised in part through status appeals. The feature that distinguishes among families is the extent to which status-based control maneuvers are modified by orientation toward inner states and/or logical consequences. Internal-subjective control strategies take the child's feelings into account and these serve to moderate demands made

on him. In turn, appeal is made to the feelings of other people as a rationale for behavior codes. Attention is directed toward inner states (to feelings, moods, and personal preferences) rather than to rules, and this encourages a more specific and complex mode of communication. Subjective controls encourage the child to take the role of another and to see his own behavior from a different perspective. Cognitive-rational appeals, on the other hand, stress objective informational feedback and direct the child's attention to the logical consequences of behavior rather than to feelings and established rules. They call for a more complex response on the part of the child for he must attend to a sequence of ideas and observe the relationship of events which, though separated in time, are brought together in anticipation of alternative consequences which may be expected to follow different immediate actions.

These regulatory maneuvers are similar to the influence techniques employed by Moustakas et al. (1956) to describe mother-child interactions. As mentioned in the previous discussion, these strategies closely resemble the training conditions outlined by Harvey, Hunt, and Schroder and they have been found to relate to a variety of cognitive behaviors in the child. Moreover, such concepts have proved efficacious in predicting whether a child will take an assertive-exploratory or passive-compliant approach to his environment and whether reflective or impulsive behaviors will occur in problem-solving situations. In light of Dawson's findings (Dyk and Witkin, 1965), we would expect that those mothers placing greater emphasis on authority would have more field-dependent children. Procedures used previously by Hess and Shipman will be included in this study to assess the mother's control techniques. Specifically, these procedures are:

a. Interview questions asking how the mother would handle minor discipline problems--e.g., misbehavior in school, spilling food on clothing.

b. The "First Day Question" which asks the mother to imagine that her child is ready to enter school for the first time and to say how she would prepare her child for this experience. Verbatim responses to this question will be recorded. (Note, only part of coding pertains to control; responses are also coded for attitude toward school and language style.)

c. Structured interaction situations in which the mother is asked to teach her child to sort objects and to copy designs with an Etch-A-Sketch.

4. Teaching Techniques: These refer to how the mother organizes and gives meaning to the information that reaches her child and to how she helps him make sense of new information. In the Hess and Shipman study (1965, 1968a) of the cognitive environments of urban preschool children, these techniques appeared most clearly in the structured interaction situations described above under

"control technique" procedures. Those teaching strategies which were found to be more effective included: use of specific language in labelling the task relevant variables; orientation of the child to the task; presentation of concepts and information in properly organized sequences so that the child gained some experience in following a chain of ideas; attempts to elicit feedback from the child to discover how much he understands and replies to his feedback; encouragement of the child's verbalization of the task; and greater use of positive reinforcement. In general, the data suggested that the differences observed among the mothers were not differences between two or more specific, identifiable teaching "styles", but instead may be conceptualized as differences in complex, multidimensional behavior which ranges from the restricted, repetitive, and reactive to the more elaborated, varied, and proactive.

The variation among mothers may be seen as differences in the amount and specificity of meaning which they were able to impart to their child in response to his behavior. Furthermore, these teaching techniques--which predicted the child's relative success in the teaching situation as well as his performance on other cognitive tasks--tended to promote certain attitudes towards the learning experience. The net result of maternal inability to initiate and maintain the child's interest in the task and to present task information in a manner that could be understood, was not only the child's failure to learn but his manifestation of self defeating attitudes and habits. It seems possible that for many children such experiences occur frequently enough to lead to a negative valence for all learning situations.

These maternal teaching techniques will be assessed by observing the mother and child in three structured interaction sessions:

a. Teaching a simple school relevant task (at ages 3 1/2 and 4 1/2, color and function sorts of familiar objects).

b. Teaching a more difficult block sorting problem of less practical relevance.

c. Teaching the copying of designs with an Etch-A-Sketch.

The first task, being simple and somewhat more familiar, will serve as a warm-up task. It also will allow comparison of the mother's teaching techniques in a more or less "natural" situation. The Etch-A-Sketch differs in requiring less verbal instruction and eliciting more control responses.

Of additional interest in this study will be how the degree of congruence between home and school teaching techniques affects the child's functioning in a learning situation. It is hoped that for a small subsample of children who attend Head Start, the teacher may be observed in the same structured interaction sessions to enable more direct comparison of the techniques used by the child's mother and teacher.

5. Language Process Variables: The environmental antecedents and behavioral consequences (for both mother and child) of elaborated versus restricted codes constitute the central theme of Bernstein's theory and the Hess and Shipman research. Since they have been described extensively in another section of this report ("Further considerations in the measurement of verbal behavior"), they will not be discussed at length here. Suffice it to say that these codes are important mediators of the environment--that real environmental restrictions on behavior become translated via language into restricted modes of information processing and problem solving. The relationship of these codes to the control techniques utilized by the mother and the resulting consequences for the child's cognitive behavior have been discussed in previous papers (Hess & Shipman, 1968b; Olim, Hess, & Shipman, 1967). Assessment of the mother's language code will be obtained through the following procedures:

a. Structured mother-child interaction situations, described above, in which the mother is asked to teach her child a new task.

b. Ratings by the interviewer of the mother's speech and language patterns during the interview.

c. Response to the "First Day" question.

Ratings and verbatim analyses will be based on the degree of restriction or elaboration of syntactic structure in the mother's speech, since complexity of language structure is more clearly indicative of quality of verbal thought and intelligence than is vocabulary.

In addition to these data on the nature of the language model presented to the child, information will be obtained on the variety of contexts in which the child can learn language--e.g., types of books, magazines and newspapers read in the household, reading materials specifically for the child, use of radio and TV, and time spent by an older member of the household reading to the child. Particular attention will be paid to amount and correctness of verbal usage when the mother is observed with the child, and the interviewer's rating of signal-to-noise ratio in the household.

6. Differentiation of the Environment--Knowledge, Attitudes, Beliefs: All theories of development, whether cognitive or social, revolve around the individual's progressive differentiation of self and environment. To paraphrase Piaget on the subject, each stage of development begins at the boundary of self and external world and proceeds to differentiate in both directions at once (Flavell, 1963).

The importance of such progressive discriminations is made obvious and explicit not only in Harvey, Hunt and Schroder's conceptualization, but in many other theories as well--from Lewin's field theory to socialization theories based on Freud (see Baldwin, 1967). It is the more cognitively oriented theories, however, which have gone farthest in specifying the characteristics of open and differentiated versus closed and

undifferentiated belief systems (Rokeach, 1960; Rotter, 1966). Likewise, it is the more cognitively oriented theories which have made the most specific linkage between available differentiations in the environment and the child's developing belief systems and ability to make discriminations (Harvey, Hunt and Schroder, 1961; Bernstein, 1964). Finally, it is the more cognitively oriented theories that have studied variables most amenable to direct observation (e.g., maternal language code and knowledge versus maternal "warmth"). For all of these reasons, major emphasis in this study will be on cognitive variables, broadly speaking,*which influence the child's perceived differentiation of the environment. In particular, we will be concerned with the mother's objective differentiation of the world (her knowledge of it) as well as her subjective differentiation (her attitudes and beliefs about it). The range of the mother's environment we will focus on are: child, school, local community, and the larger educational system. Schematically, the sampling of mother's knowledge, attitudes, and beliefs we will obtain may be represented as follows:

Available Differentiating Schema	Aspects of the Environment			
	Child	School	Community	Educational System
Knowledge 1. Objective information amount; validity; differentiation (global-specific)				
Attitudes 1. Evaluation along a positive-negative dimension 2. Differentiation (specificity)				
Beliefs 1. Degree of uniqueness 2. Potential for achieving goals 3. Feelings of control over (powerlessness)				

*It is understood that cognitive behavior is an expression of the integration of intellective and non-intellective behaviors.

Implicit in this schema is the hypothesis that one can distinguish meaningfully between knowledge, attitudes and beliefs as available psychological avenues for differentiating the environment. While they may be highly correlated (particularly in certain types of individuals), they are not viewed here as necessarily the same. For example, a person may have little specific knowledge about the local school and may hold a generally pessimistic attitude about its present functioning--yet he may believe that it is capable of fulfilling certain specific potentials. A corollary of this hypothesis is the notion that obtained data should be viewed as a function of both rows and columns. That is, a person may be relatively open and differentiated with respect to one aspect of his environment but not to another. Similarly, he may have specific and differentiated knowledge across a fairly wide spectrum of the environment which does not penetrate to the level of his attitudes and beliefs.

It is recognized that the realm of attitudes has a history of investigation in and of itself which is too long for documentation here. In general, however, such studies have been concerned with the degree or direction of attitudes along a positive-negative dimension. Attention in this study will be given both to direction of attitude and its differentiation. In other words, initial direction of an attitude (positive or negative) and any subsequent changes will be of primary importance. Of equal importance, will be the initial differentiation (degree of specificity) of an attitude and any subsequent changes therein. As hypothesized at this time, direction of an attitude (positive or negative) will not necessarily correlate with differentiation of attitudes, knowledge, or beliefs.

In discussing specific items for inclusion in the study we will follow the format of columns--i.e., aspects of the environment--simply because this is the most conventional way of describing measures (attitudes toward schools, etc.). It should also be noted that while "differentiation" is a term applied to inanimate aspects of the environment, we have followed the Dyk and Witkin (1965) notion of "individuation" with respect to the child. "Individuation" is a form of differentiation as it applies to another person.

The following item clusters are proposed as candidates for inclusion in the family interview:

a. Individuation of the child: One of the functions of the family is to provide a context in which the child interacts with other people and thereby develops a sense of self (Hawkes, 1957). Of critical importance in this process is the mother's perception of the child, which is reflected to him in innumerable ways and serves as a powerful model for his developing self concept. While it would be impossible to tap all aspects of the mother's perception in this study, we will at least want to know the degree to which she sees

the target child as a distinct individual. Does she differentiate him from other children in the family or is he distinct in name only?

To assess the mother's individuation of her child, we will administer some of Slaughter's (1968) questions plus new questions now being piloted. These questions are designed to elicit specific knowledge of the child in various cognitive and social-personal areas as well as general expectancies regarding his future behavior and abilities. For some questions, validity of the mother's report will be assessed by observation of the child in the classroom and the individual testing situation. For example, can the mother predict the kind of tasks her child will enjoy most, those with which he will have the most and least difficulty, his reaction to strange adults, to other children, etc.? It is hypothesized that those mothers lacking a feeling of self-realization and ability to implement their goals will be less likely to differentiate their children.

b. Differentiation of school: How a mother defines the school indicates which aspects of the new situation (i.e., new to the child) are most important to her. Until he has entered and actually experienced this new realm, the preschool child's notions about school are likely to be hazy and inaccurate. He can, however, anticipate it, especially if his mother prepares him by drawing attention to those aspects she deems most important. If she does not tell her child what she thinks of school nor describe the daily round of a classroom, she will often express her attitudes and expectations indirectly. Such indirect expression, however, has a direct effect on the child in developing attitudes and behaviors he believes will be necessary for coping with school. Hess and Shipman (1968b) have asserted that the lack of preparation frequently observed for children from the lower working class sections of our society is not merely a matter of knowledge, but represents orientations to authority, the school and the learning process that have been learned in the child's preschool experience and that are constantly reinforced by his home and community environment. The mother is thus seen as socializing the child into the role of pupil--a role which includes expectations and learned responses which structure the child's interaction with his teacher, with the tasks and materials of the classroom, with the rules of the institution, and with his classmates/peers.

To obtain the mother's definitions and perception of school, responses to the "First Day" question will be taped and coded according to the Hess and Shipman system. In this open-ended technique, the mother is asked: "Imagine that your child is going to school for the first time, what will you do, what will you tell him?" The coding system enables one to assess the relative proportion of message units pertaining to need for obedience, opportunity for learning, recognition of emotional experiences connected with starting school, and description of preparatory activities. The fact that many low-income mothers regard the school as a distant and formidable institution with which they have had very little interaction and over which they exercise very little control tends to lead to responses which present the school as a place in which one must obey the teacher and follow the rules rather than as an opportunity for interaction and learning. One would hope that as a result of Head Start, low income parents would feel less alienated from the educational system and would come to define the school not only in a more positive way but also in a more differentiated fashion, thereby providing their child with more adequate and useful images of the school, of the teacher, and of the role of pupil. Prior research (Clarizio, 1968), however, suggests that the school-home aspect of Head Start programs has not modified the educational attitudes of lower-class mothers.

In addition to the "First Day" question (which will be asked at the testing center), certain items from the Educational Attitude Survey will be included in the family questionnaire. At a future date in the study--i.e., when the target child actually is in a school setting--the Clarizio (1968) Maternal Attitude Scale or similar items will be included in the questionnaire.

c. Differentiation of community: Mostly new questions regarding knowledge about the community--"where do you go to vote"--as well as attitudes and beliefs about the community have been developed and are being pretested as part of the home interview. These have been described in detail in chapter J of this report.

d. Differentiation of larger educational system: Included here are new plus tried questions regarding knowledge of what steps are necessary to achieve certain educational goals (e.g., a doctor), attitudes toward present functioning of educational system with respect to low income families, beliefs about the potential of the system to fulfill goals of low income families, and the mother's differentiation of what makes a good and bad teacher.

7. Cognitive Styles: Whether or not knowledge, attitudes, and beliefs are likely to be highly correlated within a person may be considered a matter of cognitive style. Style variables proposed for assessment in this study are as follows:

a. Analytic functioning. The WAIS subtests of block design and picture completion will be administered to the mother the second year of the study in conjunction with other general ability testing.

b. Reflectivity-impulsivity. To assess this variable, an appropriate version of the Kagan Matching Familiar Figures test will be administered during the second year testing period. Relatively short latency times on this measure are indicative of less reflection and evaluation of alternative responses. Such responses also indicate relatively little attention to stimulus details.

Following the work of Witkin and his associates (1962), we will investigate the relationship between the mother's performance on the suggested tests of analytic functioning and the child's performance on similar measures, as well as on measures of field dependence--independence. According to the Dyk and Witkin (1965) findings, we would expect less differentiated (less analytic) mothers to have less differentiated and more field dependent children. We would also hypothesize that this lack of differentiation would be reflected in the greater use of restricted language codes and non-specific teaching in the interaction sessions.

With respect to the reflectivity-impulsivity variable, one would predict that those mothers with shorter latencies on the Kagan measures would demonstrate less efficient information-processing strategies, as shown by inability to plan and control the Etch-A-Sketch situation and poorer teaching of the sorting tasks. Impulsivity in the mother might also be expected to relate to tendencies for non-verbal rather than verbal teaching, domination of the child in the interaction setting,

and limited sequencing and discrimination. Such behaviors on the part of the mother should be predictive of limited categorizing ability and impaired verbal skills in the child.

Finally, we would hypothesize both style variables to be a consequence of the mother's relative degree of felt control over her environment. Shorter latencies on the impulsivity measures, for example, should be correlated with the belief that "correct" responses on a task are due more to chance factors than to a person's skill.

It should be noted that although we are not listing achievement press separately as a process variable, this is because, as commonly defined, it is already subsumed under the previously listed process variables. Measures relevant to achievement press include: parental aspirations for the educational and vocational development of their children; parents' self-aspirations and expectations; interest in academic achievement; parental guidance in the attainment of educational goals (e.g., helping with homework and mode of teaching in the structured interaction sessions); use of reinforcement to shape children's behavior; and knowledge of both the educational system in which the child participates and the educational progress of the child within (and outside) the system (e.g., knowledge of and reaction to the child's test performance and, later, to his school grades). In accordance with the findings of Crandall, Preston, and Rabson (1960) emphasis is being placed on the mothers' direct reaction to their children's achievement efforts. In addition to indices such as these, we will specifically note whether there are models in the house exemplifying the results of advanced education. Enrollment of children in the family in Head Start or other preschool settings will also be used as an indication of the parents' academic achievement orientation.

These data will be analyzed according to a model employing expectancy of outcomes and value of outcomes (see Chance, 1968), in order to predict the child's achievement behavior. In accordance with Rotter's social learning theory, the potential for any behavior to occur under a given situation is seen as a function of the expectation that the given behavior will be effective in securing the available reinforcement, and the value of that reinforcement for the person.

Affective aspects of the parent-child relationship have likewise not been singled out as a broad category of process variables to be investigated in this study. In the past, the exchange between mother and child has been conceptualized and studied primarily in terms of affective and disciplinary behavior, with autonomy-control and affection-rejection appearing frequently in factor analytic examinations of mother and

child (Schaefer, 1959). We accept these as critical dimensions but choose to focus upon another feature--the cognitive aspects of exchange and the cognitive consequences to the child of the affective and control strategies employed by the mother. This change in emphasis is similar to Yarrow's (1961) reevaluation of the maternal deprivation concept in terms of amount and variety of environmental stimulation provided the child.

As noted in the previous pages, one of the consequences of the control technique employed by the mother is the child's attitudinal approach to problem-solving situations. Similarly, in describing the mother's mode of information-processing, the possible effects upon the child's attitude towards future learning situations as well as upon his success in learning the task was discussed. Various research studies have reported on the lower-class family's predominant use of punishment, both verbal and physical, in controlling the behavior of the child (Bernstein, 1964; Hess & Shipman, 1968a; Klaus & Gray, 1968; Waters & Crandall, 1964). For Rainwater (1966) such behavior is the outcome of the victimization process which works to prepare the family members to operate in the ghetto. Whatever the cause, one might account for a difference in cognitive behavior by referring to the child's reinforcement history leading to differential expectancies of success. As noted in the research literature, high motivation to achieve is generally associated with high expectancy of success. Moreover, as Lewis and Goldberg (in press b) have pointed out, the extent to which the mother gives the child feedback affects the child's development of a generalized expectancy about his effectiveness in obtaining rewards or punishments in the world. Consequently, one of the maternal teaching strategies to be noted is the extent to which feedback is employed differentially--that is, when giving feedback does the mother focus on the child's errors or successes? In the interview we will inquire about the mother's preception of her child's competence in relation to other children his age.

Although the research literature on the relationship of parental affect and achievement press variables on the child's achievement behavior and motivation is somewhat confusing and contradictory, several studies have found parental pressure for achievement to relate to the child's achievement only when done in the context of family warmth (Baumrind, 1963; Milner, 1951). Similarly, parental antecedents of affection and approval have been found to correlate significantly with the child's belief that he can affect his environment (Katkovsky et al, 1967). In this study, indices of maternal warmth will be obtained in the structured interaction sessions by tallying the incidence of positive and negative evaluations of the child and by rating the mother immediately following the interaction sessions on the range and modal level of affection

displayed. As pointed out by Hess (in press), such global variables as control, strictness, and warmth are no longer seen as useful mediating variables. Instead, the specifics of behavior concealed by these terms are beginning to be identified with observable patterns of behavior (such as degree of monitoring) which will perhaps prove more useful. Specific type of control, for example, and the cognitive appeal on which it is based are now of more concern than a gross measure of parental control. In summary, the process variables of major interest in this study reflect the shift in areas of research interest over the past decade.

C. Situational and Status Variables: Rationale and Proposed Measures.

The process variables described above are relevant mainly within the context of a dyadic (mother-child) relationship. We have given priority to these variables for reasons of their empirical and theoretical significance, as outlined in the section on General Rationale. Implicit in that rationale are also assumptions that the mother is the most important socializing agent for the preschool child and that the nature of the mother-child interaction has critical consequences in shaping the child's resources for cognitive, social, and emotional functioning. As emphasized throughout this paper, however, the Harvey, Hunt, and Schroder conceptualization is a generic one. In relating training conditions to developmental level, it pertains not only to dyadic structures (mother-child; teacher-child) but also to the broader and more static aspects of environment which affect both individuals and groups (e.g., families). We turn now to a consideration of these broader aspects of environment.

Two general criteria for selecting situational and status variables were given in the opening statements of this paper --i.e., significance in (a) defining important aspects of the child's psychological as well as physical environment, and (b) identifying subpopulations which should be analyzed separately. To these general criteria we would add the common sense standards of taste with respect to invasion of privacy and the probable accuracy or usefulness of the obtained information. By virtue of these latter criteria, questions concerning annual income and detailed marital history will be omitted. Not only is income and marital history viewed here as a private matter, but questions regarding these aspects are likely to be answered in such vague terms as to constitute unreliable and/or uncodable information.

Within the framework of these general criteria, then, the study will seek information which relates to the degree of environmental stimulation available to the child and which more clearly defines his poverty in terms of material things and conditions which are taken for granted by the dominant

culture. As pointed out by Archibald (1967), the culture of the urban Negro child (or any disadvantaged population) is a matter of "Poor and what else?"--and it is the "what else" which is generally critical. The following specific variables are proposed in an attempt to shed further light on "what else."

1. Information for identifying subpopulations: Such information will consist of age, sex, and race of child; age, race, and occupation of parents; language spoken in the home; locale (urban-rural); and type of dwelling place. Information regarding welfare status of family will be obtained later in the study from the relevant welfare agency.

2. Educational level of parents.

3. Family Structure (i.e., presence of father in the home).

4. Number of adults in the household, particularly adult availability as defined by adult to child ratio.

5. Number of other children in the household.

6. Home resources: Availability of books, toys, records, radio, TV.

Included among these variables are those that have been traditionally used to assign social status to subjects. Although we recognize the divergencies in conceptions of the relative importance of various aspects of social stratification, there is sufficient agreement among the many indices of social status position to serve most research purposes. Hess (in press) in reporting on a factor analytic study of 19 stratification indices, found variables closely related to occupational level, education, and residence to account for most of the variance. It is of interest that income was the least effective of the 19 variables in indicating socioeconomic status, as evaluated by agreement with other well-known measures.

As summarized in a review by Green, Hofmann, and Morgan (1967), the kinds of variables listed above (2 - 6) have been found consistently related to the intelligence and achievement level of children. The results of the national evaluation of 1966-67 Full Year Head Start programs indicated these same variables as significant predictors of initial Binet performance and, in some cases, of gains made during the year (IED, 1968). In addition, they are all seen as having a logical relevance to the cognitive stimulation and/or emotional support available for the child and might

be expected to differentiate those families who do and do not participate in Head Start. It should be recognized, however, that although stimulation level is considered an important factor in intellectual growth, the relevance of variables 4-6 suggests that it is not amount of stimulation, but the patterning and nonrandomness of such stimulation which is crucial for cognitive development. Finally, it should be noted that changes in variables one through six may be relevant to assessing the upward or downward mobility of the family during the period of the study.

7. Ordinal position of the target child. While the relevance of this variable is not immediately obvious, support for its inclusion comes from several studies. Freeberg and Payne (1967) found that sibling rank (as well as family size) correlated with several dimensions of childrearing practice. They concluded that both of these factors influence the extent to which a parent can engage in a variety of activities that inherently require sustained participation. In a recent review of subcultural differences in child language, Cazden (1966) refers to Vera John's finding of a birth-order effect on language development within a sample of lower-class Negro children. Similarly, Hess et al (1968) report that lower class mothers who had larger families were more likely to appeal to power and punishment in controlling their 4-year-old child. It is recognized, however, that the age and sex of other children in relation to the target child will interact in determining specific effects. For example, father's absence may be expected to be a more interfering factor when the target child is an only boy with older female siblings.

8. Behavior patterns of older siblings. Assuming that older siblings are important potential models for the child, questions will be included which relate to the older children's school achievement, attitude toward school, membership in peer groups, etc. These data will be collected in later years as the target child is ready to move into his siblings' world. It has been pointed out that in many poverty families it is an older sibling who often assumes the role of the "parental child." He teaches others the manipulations, often faulty and asocial, that he has learned, usually from his peers on the street (see Brown, 1965, Manchild in the Promised Land).

9. Conditions constituting "stress" for the child. It is hypothesized that a number of family conditions (not infrequent within the ghetto culture) serve to constrict the child's psychological environment and create a stressful situation.

These include:

a. Instability or frequent mobility of the family

b. Severe or recurrent illness in the family

c. Erratic versus a relatively steady employment history

d. Physical and psychological "depression" of the home residence--e.g., repair of the home inside and out, lighting conditions inside the home, potential hazards (broken glass, location near a bar) in the neighborhood, etc. Ratings on these variables would be made by the interviewer following each interview. In addition, each interview would include a rough index of crowding (i.e., ratio of rooms, excluding bathroom, to people in the household.)

Similar to our need to assess the ecology of the classroom for better understanding of the behavior that takes place there, the physical aspects of the home environment are seen as factors determining many relevant child behaviors as well as the emotional tone of family members (e.g., despair and apathy).

10. Child's possessions - material objects and space. Insofar as possible, information will be obtained on the number of things (books, toys, etc.) the child possesses; whether his clothes are his own or hand-me-downs; whether he has a designated space in the household for his things (a closet or drawer space); and whether he has places (a room, a bed) that are his own or which are available for his private use. Not only is this variable considered an aspect of individuation, but it is a particularly important need for the ghetto child who often has nothing to call his own nor any place to which he may escape for peace and solitude. As expressed by the Negro poet Gwendolyn Brooks in The Beaneaters (1960):

> "Somehow to find a still spot in the noise
> Was the frayed inner want, the winding, the
> frayed hope
> Whose tatters he kept hunting through the
> din.
> A satin peace somewhere.
> A room of wily hush somewhere within."

11. Child's range of mobility. Relevant to amount of stimulation in the environment is contextual variety of the environment. Where is the child allowed to play inside and outside the house? Where is he allowed to go in the neighborhood? On what excursions outside the house is he taken (supermarket, visiting relatives, etc.)? It is only logical to expect that the number of different places a child goes and different encounters he has will largely determine the variety of stimulation available to him.

D. An Overview of Measurement Strategy for Assessing Family Characteristics

In the preceeding sections of this report we have presented: a general rationale for the family measures; a conceptual framework for directing the selection of variables, interpreting obtained data and generating hypotheses; and specific rationale and candidates for the process, situational and status variables. We turn now to considerations of measurement strategy. What are the relative strengths and weaknesses of the proposed research from a methodological standpoint? The issues inherent in such a question concern (1) the adequacy of the interview as a research tool and (2) the adequacy of observational procedures.

1. The Interview as a Research Tool. Many studies dealing with the presumed antecedent conditions of child development have relied heavily on retrospective reports of the mother. Such "recall" procedures have been subject to rather obvious criticism in terms of the reliability and validity of parental report (Bell, 1958; Mednick and Shaffer, 1963; Robbins, 1963). An alternative strategy is to interview parents (primarily the mother) regarding current child-rearing practices and child behavior. Such questionnaires are frequently factor analyzed and the resulting factors regarded as underlying dimensions of parental practices and child behavior. The pitfalls of this approach are also legion, however, as summarized in the recent critique by Yarrow, Campbell and Burton (1968). The most serious problem of the interview, whether it focuses on past or current practice and behavior, is that of validity--the questionable assumption that impressionistic data is adequate support for hypotheses regarding actual behavior. Yarrow, Campbell and Burton identify at least three factors which affect the accuracy of reporting in interviews.

a. Social desirability: Many interview questions are couched in blatantly undisguised terms of what society generally considers "good" and "bad" parental practice. While we have little specific or systematic information on child-rearing mores of lower class populations, such things as provision for the child's basic needs, warmth, and extreme punitiveness are likely to be evaluated by similar standards at all levels of society. In any case, whether or not the investigator holds preconceived standards for parental behavior, direct questions that are perceived as threatening (i.e., that the respondent feels are subject to "good"--"bad" interpretations) usually produce defensive reactions and distort the accuracy of reporting.

b. Generality of questions and the problem of sampling: Failure to specify the situational context for behavior is another serious drawback to accurate reporting. Many interviews approach the behavior of mother and child from a "general trait" framework and request descriptive accounts of behavior in which the situational setting is defined only in very gross terms (behavior at home: behavior at school) or not at all.

Under such conditions: "The investigator does not know the sampling of behavior that is the basis of a mother's responses. He proceeds, therefore, with unknown and probably different samples from each respondent. For example, when mothers describe their reactions to their children's demands for attention, or their attempts to control child behavior, are they smoothing a curve of responses in many different situations, are they recalling the most vivid or recent ones, or are they describing situations in which they have had the most satisfactory experiences? ...Are different mothers sampling differently? It seems likely that they are. Certainly, one anticipated effect is an instability in responses from the same mother from one measurement to the next." (Yarrow, Campbell & Burton, 1968).

c. Accessibility to observation: It is only common sense that greater accuracy of reporting is likely to occur with respect to behaviors that the mother is most likely to observe. Information regarding internal states of the child (e.g., guilt) or behavior she cannot readily observe is prone to distortion. Such questions should be avoided entirely or else interpreted with extreme caution.

To summarize, factors of social desirability, generality, and inaccessibility to observation are common faults of interview questions which affect the validity of reporting. When one evaluates the proposed interview in terms of these validity considerations, several conclusions become apparent. First--and most important--it is obvious that the whole question of accurate reporting is not as relevant for many parts of our interview as for the typical instruments surveyed by Yarrow, Campbell and Burton. This is true because our conceptualization and interpretive framework do not rely heavily on assumptions about the actual occurrence of specific, independent instances of behavior. Manifest behavior is obviously important, but only insofar as it reflects underlying consistencies in information processing and response strategies. Our conceptual framework depends mainly on the assumption that a mother's perception of the environment (beliefs and attitudes) and characteristic styles of interacting have pervasive effects on her behavior which critically influence the child's development.

Although interaction with other people is important (increasingly so in later years), the mother is viewed here as the major socializing agent for the child in his early preschool years. [1] That is, she assumes a critical role as major interpreter and

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[1] We recognize, however, the dearth of research concerning the father's influence on the development of the child in the early years--a paucity resulting primarily from practical problems of doing such research. Plans, however, are in process to expand our data on the structured interaction sessions with a small subsample of fathers. Previous research would lead us to expect that mothers and fathers would differ in their teaching styles, particularly with regard to interaction with same or opposite sexed child, and that the same behavior would be differentially effective depending on sex of parent and child

reflector of "reality" during a time when the child is busy constructing reality for himself and developing information processing strategies and response styles appropriate for dealing with it. If the child's strategies and styles inhibit progressive differentiations of self and environment, then his development will be arrested. In her role of socializing agent, it is the mother's own perceptions and styles which largely determine the constriction or openness of the environment she structures. It is essential to understand this conceptualization, because it puts the notion of "validity" in a somewhat different light. For the most part, correspondence between verbal report of parental practices and actual behavior is not a primary concern in interpreting the proposed interview data. Rather, attitudes and beliefs about meaningful aspects of the mother's environment are the focus of interest for a substantial portion of the interview questions.

Since requests for such information (attitudes and beliefs) are less likely to be threatening than direct questions about behavior, they are less subject to a social desirability response bias. Nevertheless, we will pay careful attention to the possibility of such bias in piloting and pretesting the interview. One of the candidate scales proposed for inclusion in the study (Rotter's I-E scale) has been intensively investigated for bias effects and has repeatedly demonstrated low relationships with social desirability scales. With respect to the sampling problem caused by vague or very general questions, our greatest emphasis is on attitudes, beliefs and expectancies that are <u>specific</u> to objects of central importance in this study--i.e., child, school, and community. The modified Rotter scale, however, will attempt to get at a highly generalized attitude.

Some interview questions do not pertain to attitudes or beliefs, but to the mother's knowledge about her child, school, and community. Although checks will be made on the accuracy of various responses to these questions, particularly those regarding the child's abilities and social behavior, it is not the absolute validity of the information which is of primary concern. Rather, response interpretation is largely in terms

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1 (continued)
(Bayley and Schaefer, 1964; Kagan and Moss, 1961; Katovsky et al, 1967, Solomon et al, 1967). Still in the majority of families, the mother or mother surrogate is the one most available to the child, and research has indicated the relatively less frequent and uninvolved interaction of the father with the young child (Freeberg and Payne, 1967). This is particularly true of the Negro low-income family, in which there is a relatively much higher incidence of father absence reported (Rainwater, 1966). It is recognized, however, that in intact homes, the mother's behavior in relation to her child is likely to reflect, in varying degrees, procedures worked out jointly by the parents as well as being in part a product of her own adaptation to her husband's needs and her relationship with him.

of the degree to which the mother's knowledge reflects differentiation of the environment and individuation of the child. We would expect mothers who have global and diffuse perceptions to be less accurate in their verbal reports than mothers with highly differentiated perceptions.

A final subset of questions does involve the inference of actual behavior from verbal report. These questions relate to the mother's participation in activities, her utilization of community and home resources, her description of sibling's behavior, and various factual information about home and personal history. While grossly distorted responses are not anticipated to such questions, they will be checked for accuracy wherever feasible. In some instances, however, it is recognized that systematic validity checking will be virtually impossible (e.g., time spent reading to the child).

So far, we have discussed validity of the interview only in terms of accurate or veridical reporting. There are at least two other factors affecting the validity of interview data which should be noted, however--adequate item sampling and problems of coding.

d. Adequate item sampling: All too often, a particular dimension or conceptual domain will be represented by only one or two items within an interview. The temptation to err in this direction is great indeed, since time is always limited and there are a multitude of potentially significant family factors which the investigator might study. Inadequate coverage of a domain, however, is hardly better than no coverage at all--and, in some cases, may lead to more erroneous conclusions. Adequacy of item sampling has therefore been given careful consideration in the construction of the family questionnaire.

e. Problems of coding: The effects of halo and of low reliabilities in coding open ended questions are well known. To the extent that it is possible, the scoring of the family questionnaire has been made entirely objective. For those questions and situational tasks where response coding is necessary, ETS will maintain high standards of coder reliability.

2. Observational Procedures

A quite different approach to obtaining information about family characteristics is the direct observation of behavior--either in laboratory or naturalistic settings. In the former case, criticism has been directed at the artificial nature of the experimental setting when contrasted to parental behavior at home (Yarrow, 1963). In the case of naturalistic observations, practical considerations have generally precluded its use, except under very special research conditions such as those that exist at the Fels Institute. As underscored by Yarrow, Campbell and Burton (1968), however, all observational procedures involve many of the same problems inherent in the interview--i.e., behavior sampling, coding reliability and observer bias. Nonetheless, direct observation has unique advantages and may be considered a necessary procedure for establishing interview validity in those instances where correspondence between verbal report and actual behavior is of importance.

In the present study, observational techniques are proposed to obtain the following information:

a. Observation of the mother's teaching styles, language codes and control techniques in a laboratory interaction situation.

b. Observation of mother's language code in the home setting (interviewer rating).

c. Observation of physical characteristics of the home and neighborhood and of available community resources.

d. Observation of the child's behavior outside the home setting (at school and the testing center).

The laboratory observations will provide primary sources of information and thus are subject to criticisms inherent in the method. Again, however, the particular variables under study (stylistic variables) have been shown to be stable characteristics which have pervasive effects on behavior in a variety of situations. Furthermore, they have been shown to relate to the child's behavior in a variety of contexts. In the Hess and Shipman research (1965), for example, mother's stylistic behavior in an interaction task was not only predictive of the child's performance at the time, but was predictive of performance on several cognitive tasks one and two years later (Hess et al, 1968; Stodolsky, 1965). Because of the particular variables under study, therefore, the typical problems of artificiality and representative behavior sampling in a laboratory setting are considerably reduced. It must be noted moreover, that the use of a structured situation allows a comparison of mother-child pairs that would be confounded by the effect of uncontrolled variation in the natural settings. Problems of observer bias and coding reliability can only be handled by thorough training procedures and exhaustive coding systems. Although the elaborate techniques used in the Hess and Shipman research will have to be modified for this study, their previous work does provide a background of experience for handling the development of training and coding procedures.

Observations of the physical conditions in the home and neighborhood will also be used as primary sources of data, but methodological criticisms are not considered particularly relevant here. There are a definite number of such physical characteristics, and these can be identified and rated with a relatively high degree of objectivity.

Ratings of the mother's language in the home setting will be used mainly as confirming data for the laboratory observations. Other observations for the purpose of confirming interview data will be mainly centered on the child--although notations regarding utilization of community resources, mother's participation in extra-family activities, etc. will also be made and used for this purpose whenever possible. As indicated previously, such confirming data on the child will be confined to the mother's reported knowledge of his abilities and social behavior (not her attitudes and beliefs about him). Because

the required observations will be quite specific in the realm of abilities (e.g., does the child know his colors, can he tie his shoes), problems of sampling, bias, and reliability are not likely to occur. Such problems are anticipated to a much greater extent in observing the child's social behavior. As is true for the laboratory observations, however, considerable attention will be given to adequate training of observers who will rate the child in a social setting.

In summary, most of the direct observations will be for the purpose of obtaining unique information. Only a small portion of the interview data will be confirmed or validated by observational procedures. As pointed out, however, such confirmation becomes crucial in the construction of interviews only when one is relying on accurate accounts of behavior in interpreting the obtained data.

E. Further Practical and Theoretical Considerations

Aside from questions of measurement strategy (interview and observational techniques), other considerations are relevant in determining procedures for obtaining information about the family. These considerations are of both a practical and theoretical nature and have been eluded to in the preceeding discussions. Specifically, however, they may be summarized as follows.

1. Appropriateness of the measure or procedure. Many mothers in the target population may be expected to have limited reading skills and verbal comprehension. Similarly, their background experience is likely to be constricted with respect to the main stream of social, political and cultural life in American society. Existing measures which have been developed on middle class populations are therefore likely to be inappropriate for use in their present form. If such measures are considered, they should be pilot tested to determine if the wording is too complex or the ideas too abstract for comprehension. Where necessary, the wording should be simplified and the ideas made more meaningful in terms of concrete life experiences of the intended population. Just such a pilot testing and revision project is now underway for the Rotter I-E scale. Final checks on the suitability of all items will be made by ETS staff in conjunction with personnel from Audits and Survey Corporation during a trial administration of the Family Questionnaire to similar subjects in the four sample locales.

2. Sensitivity of the information. The initial screening of variables and status characteristics for inclusion in the study has and should be made on theoretical grounds. However, prime consideration must also be given to the sensitivity of requested information in terms of current and anticipated political-social conditions of the country. The logic of including certain status variables (e.g., father's income) just because they have traditionally been used and have a long history in the literature will not be acceptable in this study. Where there is a definite need to obtain information that might be sensitive, steps will be taken to maximize rapport between interviewer and respondent by the timing, wording and contextual surrounding of the particular question.

3. Timing of the information and changes over time. Quite apart from the question of sensitivity, careful consideration must be given to the sequencing of information throughout the duration of the study. What information is absolutely essential to obtain at the first interview and what may be picked up later? What questions need to be asked only once and which should be repeated? If repeated, is the same wording appropriate for all the administrations over time or should there be changes? While all of these considerations cannot be resolved on an "a priori" basis, their eventual resolution depends not only upon future events in each community, but upon present identification of those variables which are most likely to undergo developmental changes and/or which would be most sensitive to environmental modification. The family measures proposed for administration this year reflect our consideration of these various concerns.

With respect to variables which might be expected to undergo developmental change, the mother's teaching and control techniques represent good examples. Does the mother modify her style and strategy as a function of the child's developing abilities, or does she remain static in her approach and (presumably) unperceptive to his growing capacities? Similarly, we will want to know if the mother's perception of her child (as picked up by the individuation and expectancy items) changes over time and is related to developmental changes in the child. With respect to variables that might be sensitive to environmental modification, such things as feelings of powerlessness, knowledge of the community, utilization of community resources, and attitudes about the school and community are obvious candidates.

4. Validation of the interview. The distinction between a mother's perception of reality and reality itself has been carefully drawn for each variable. Where reality is of crucial importance, it will be necessary to obtain external checks on the information provided by the mother. Depending upon the particular type of information involved, validation could be done by the interviewer, the study coordinator, the examiner at the testing center, school personnel, or others. In most cases such checks are unlikely to be viewed as "spying" or invasion of privacy--e.g., validating the mother's statement that her child knows color names. Where there is any question about invasion of privacy, however, permission will have to be obtained from the parent before the information is sought.

It cannot be overemphasized, however, that the validity of the information obtained is primarily a function of the adequacy of the interviewer. Particular care, therefore, will be taken in the training of interviewers and in monitoring their interactions with families.

5. Interpretation of the data. Most studies involving correlational data between family and child characteristics have received unidirectional interpretation--i.e., family characteristics are always seen as the casual agents. As Bell (1958) so aptly points out, however, such an interpretation may be open to question. In an earlier paper, Hawkes (1957)

made the point that clinicians, unlike researchers, recognize the child is a member of a primary group and that he "acts upon", as well as is "acted upon". The recently reported research on behavioral style by Thomas, Chess & Birch (1968) is a systematic attempt to study the child's own contribution to his development. Following Wolf's (1964) similar conceptualization, we would hope to distinguish between characteristics of the home that are pervasive and act unilaterally upon all family members (e.g., language standards and availability of certain resources) and those that result from the interaction of specific family members with unique personal traits. As Wolf (1964) demonstrated, the latter characteristics are specific to particular interactions within the home and cannot be generalized to the family as a whole. While initial results should be interpreted with caution, the longitudinal nature of the study provides an excellent opportunity to untangle some of the cause-effect uncertainties. Although cross-sectional studies may help prepare for longitudinal studies by suggesting specific hypotheses to be tested, only longitudinal studies can elucidate the issues of process. This factor is also a prime consideration in selecting variables and characteristics for inclusion in the initial interview.

F. Summary "Family Characteristics"

In this chapter of the report we have concerned ourselves with the origins and antecedents of educability in young children whose families live in economically and socially depressed areas. Educability, as we use the term, refers to a blend of orientations, skills and motivations that prepare the child to learn in a formal school situation. Although we are interested in various influences on the development of educability, we have focused upon the role of the mother in the emergence of this complex set of orientations and response patterns.

The general problem to which we have addressed ourselves is the understanding of how cultural experience is translated into cognitive behavior and academic achievement. In focussing on the input features of the socializing process, we hope to conceptualize social class as a discrete array of experiences and patterns of experience which can be examined in relation to the effects they have upon the child's modes of cognitive and interpersonal functioning. Consequently, our emphasis has been upon process variables, the socioeconomic status indices used in the past being considered too gross for our purposes. As Hess & Shipman (1968a) have pointed out, social class is a statement of probability that certain experiences have occurred or will occur; it is these more specific experiences that we hope to identify and study in this project.

The above considerations lead to four related arguments which constitute the conceptual context of the study: first, that strategies for processing information and for dealing with the environment are learned; second, that a significant part of this learning (and teaching) typically takes place in the early interaction between mother or mother figure and child;

third, that the growth of cognitive processes conducive to success in formal educational settings is fostered in family control systems which offer a wide range of alternatives for action and thought, and it is constricted in systems which offer predetermined solutions and few alternatives for consideration of choice; and fourth, that the nature of the dyadic exchange between mother and child is related to the social structure in which the exchange takes place. With respect to this last point, a family with few opportunities to make choices among events that affect it is not likely to encourage the children to think of life as consisting of a wide range of behavioral options among which they must learn to discriminate.

It appears that the learning styles and information processing strategies that the child obtains in these early encounters with his cognitive and regulatory environment may set limits upon his potential mental growth, unless an intervention program is instituted which resocializes and redirects him toward more effective modes of functioning. Similarly, the child who has learned to be compliant and submissive, to regard himself as ineffective in dealing with authority and inadequate in problem solving, comes to school unready to meet the demands made upon him. Such an orientation needs to be modified through experience with teachers who interact on a basis other than demanding obedience to absolute authority. This study will enable us to determine to what extent such resocialization takes place.

G. THE IMPACT OF THE CLASSROOM

Overview

Virginia Shipman

This chapter will discuss our attempt to describe the nature of the child's first school experience as defined by his experience in his particular classroom. Our strategy, as with the other areas of concern in this study, is to utilize multiple sources and foci. The classroom can, and indeed must, be defined in multiple ways.

The focus of the chapter on the classroom will be a description of PROSE, a complex attempt to define the class for each child in terms of the particular teacher-child, child-child, and child-material contacts that occur in a given time period. Such an analysis is essential when attempting to predict particular consequences of such experiences for a given child. It is recognized, however, that the summation of these particular definitions may not be sufficient for defining the "classroom as a whole." Consequently, more traditional classroom atmosphere variables such as degree of warmth, structure, and teacher directiveness will be assessed through global ratings made after repeated observation of the teacher throughout the day. These appraisals of classroom social-emotional climate and cognitive-perceptual stimulation by trained raters should add significatly to the usefulness of the study. We will be able to determine the relative presence or absence of a structured curriculum, the types of cognitive and social-personal behaviors being encouraged by the teacher, and the role of pupil she thereby is reinforcing.

As pointed out in the preceding chapter on the impact of the family, it is essential that interaction be viewed in a broad context. Teacher-child (or children) interaction, like parent-child interaction, must not be viewed as unidirectional. Just as we will feed in information about the teacher (e.g., age, sex, race, experience with preschool children, especially disadvantaged ones, and certain attitudes that would seem particularly relevant to her teaching behavior), we will be able to feed in parental report and test data previously and concurrently obtained on the children. As age, sex, and race of pupil have been found repeatedly to interact significantly with teacher behavior, these demographic descriptions of the class will be obtained also.

Following our analogy of the analysis of family and classroom variables, attention will be paid also to a physical description of the classroom. As ecologists have pointed out, the physical environment influences significantly the behavior that takes place therein. Classrooms will differ in what is

available for use by the teachers and the pupils, as well as how these materials are utilized. At various intervals throughout the year the ETS field coordinator will visit each sample classroom, draw a map of it, and record the materials available for use. Among those data obtained will be the relative amount of open space, presence of specified activity areas, adequacy of lighting, general repair condition of room and materials, and appropriateness of size of chairs and tables. Not only will such variables affect the nature of the activities in which the children will engage, but they will be interrelated with the size of the group involved.

It should not be necessary to point out that it is only for convenience that the impact of the classroom is considered as a separate chapter. This in no way implies that we consider what happens in a particular classroom isolated from the multiple and diverse environmental factors impinging upon it. Included therein are the administrative policies controlling that class and the nature of the interaction between the teacher and other members of the administration. For example, the degree to which the teacher may encourage independence in her pupils reflects, in part, the autonomy she perceives in the management of her classroom. Similarly, we do not restrict the study of program variation to analysis of what occurs in the classroom. Head Start may be best defined by the unique aspects that it has added to its definition of "program." The Head Start program is not merely the interaction between teacher and child and teacher and Director, but is also the interaction between such important factors as the teacher and teacher aide, functioning of the parent program, the role of the nutrition consultant, and the social worker aide. Next year, therefore, when our longitudinal sample is eligible for Head Start, we will be able to describe the process of Head Start, as defined by depicting the year-round operation of the Head Start Centers in our sample.

Measurement Rationale

Donald M. Medley

The primary role of the classroom task force has been assumed to be that of describing the early school experiences of the sample of disadvantaged children chosen for the project. In order to meet the requirements of the project fully, these descriptions must be quantitative, must be relatable to each individual child (i.e., must describe his experience), and must be expressed in terms of psychologically and educationally meaningful scales or dimensions, rather than in terms of frequencies of occurrence of individual items of behavior.

There seem to be three basic strategies available for securing such descriptions: (a) rating classroom behavior, (b) analyzing classroom behavior, and (c) measuring classroom behavior through structured observational techniques.

Rating classroom behavior is a procedure in which the rater observes a sample of the behavior in question and then attempts to estimate directly the location of the observed behavior on each dimension being studied. A well-constructed rating system will specify at least some of the behavior on which the ratings should be based, but it is impossible to tell from the rating itself which behaviors were observed in any given sample, or how they were weighted by the rater. The only rating system sufficiently comprehensive to be considered as a tool for studying classroom behavior is that developed by Ryans for the Teacher Characteristics Study (Ryans, 1960).

Analyzing classroom behavior is a process in which a behavior sample is broken down into very small units, and the meaning of each one is then determined as accurately as possible. When the analysis is complete it is possible to describe in great detail the kinds of behaviors exhibited, and the frequency of each. Although it is not usually done, it is possible to dimensionalize such data. Because so careful an inspection takes time, the behavior sample must be recorded and then analyzed later. Among the systems which have been used in analyzing classroom behavior in the past, perhaps the most exhaustive are the ones developed at Illinois (Smith & Meux, 1962; Smith, Meux, Coombs, Nuthall, & Precians, 1967) and at Teachers College, Columbia University (Bellack, Kliebard, Hyman, & Smith, 1966).

Measuring classroom behavior is a process in which a classroom visitor records teacher behaviors as they occur by coding them into a form which is later scored along dimensions of behavior, best exemplified by the series of instruments based on the "OScAR technique" (Medley, Impelletteri, & Smith, 1966; Medley & Mitzel, 1958; Medley, Schluck & Ames, 1968; Schueler, Gold, & Mitzel, 1962). The items which are

the basis for measuring a dimension do not, as a rule, constitute a complete definition of the dimension; rather, they are regarded as symptomatic of other behaviors not actually recorded. Thus, it is possible from a behavior record to find out what behaviors were actually exhibited by the person observed, although it is not usually possible to equate his score on the items used with his actual place on the dimensions, any more than a pupil's score on an IQ test can be equated to his actual intelligence. On the other hand, it is possible to lay bare the nature of the behaviors on which the behavior score is based by examining the record itself.

The technique referred to as analysis of classroom behavior is quite impractical for a study of any magnitude, because of the fantastic expense involved. Not only is the process of securing sufficiently detailed records (in the form of videotape recordings) of the behavior of each of a large number of children costly, but the painstaking analysis needed to produce the behavior scores needed for the study involves an amount of time that could be prohibitive. Neither of the studies cited which used these techniques involved more than 15 classrooms.

At their worst, rating instruments require judgments on too many variables, based on cues not defined distinctly or explicitly enough, with the result that a general impression (the "halo effect") becomes the major source of variation in the ratings on any dimension, so the names assigned to the various dimensions become meaningless.

At their best, as in the case of Ryan s' rating scale (already mentioned), the task of the rater becomes extremely difficult, and the validity of the results obtained become so dependent upon the training, experience, and other less clearly defined traits of the rater as to limit their value severely. The crucial characteristic a rater must possess is lack of involvement of any kind in the phenomena being rated.

The present study is to be conducted with large numbers of children in several different areas, so that the number of raters needed would be quite large. The difficulty of recruiting and training a sufficient number of raters would be formidable for these reasons alone. But the real problem arises from the practical importance of recruiting them from the local communities. To expect a member of a ghetto community to make disinterested ratings of what happens in the community schools does not seem to be a reasonable request to make, nor does it seem a task that even the best-intentioned person could perform successfully.

By process of elimination we arrive at the third approach, the use of a structured observational technique for measuring classroom behaviors. We have stated the general arguments for the use of such procedures elsewhere (Medley & Mitzel, 1963); it is not necessary to repeat these arguments but only to bring them up-to-date, particularly as they relate to this project.

Among the earliest successful techniques for measuring classroom behavior (in the sense used here) are the verbal category systems of Withall (1949) and Flanders (1960). The fact that reliable differences between teachers are routinely found, both with respect to frequencies of behaviors in certain categories and to more elaborate measures derived from these frequencies, is evidence that this approach can and does yield dependable descriptions of classroom behavior.

In the work already cited in the OScAR technique, we sought to move to a level which was perceived as more primitive than this earlier work. The observer using OScAR classifies events in the classroom into categories which in themselves are less reliable, in the sense of discriminating between classes, than those used by Withall and Flanders, and which are not of sufficient psychological interest to constitute useful dimensions of behavior in themselves. The one requirement the categories or items must meet is that it be easy to obtain good agreement between observers as to the category into which any single event should be classified. A record of frequencies of occurrences of events in each of a set of such categories is an accurate one; moreover, if the variety of categories is sufficient, it is usually possible to devise composites (with or without varying weights) which are more reliable and more meaningful and these composite "scores" can discriminate classrooms reliably along dimensions which are of psychological or pedagogical interest.

An important principle learned from these experiences is that the observer does not have to make his observations in terms of a given dimension--or even be aware of its existence--in order to produce reliable measures of that dimension. Once this point is grasped, it is possible in constructing a schedule to look for items that are easy to observe--categories that are easily and accurately discriminable by psychologically and pedagogically naive observers--and are minimally related (on the surface, at least) to dimensions related to the value systems the observers may possess. This makes it possible to secure objective records of behavior, in other words.

A record obtained in this fashion may be thought of as a matrix of coordinates describing the location of a particular phenomenon in a multi-dimensional behavior space; a set of records should locate different phenomena in different parts of the space.

The purpose of the scoring or dimensionalizing process may be thought of as to fit the space with a set of axes (dimensions) which make sense to us. Scoring a set of records is tantamount to rotating the original axes (the raw observations) into a new set (the scores) which describe the phenomena in terms of more interesting or meaningful dimensions.

The key to success in this enterprise lies, of course, in concocting a set of items sufficiently varied so that measures (scores) may be obtained on as many important dimensions as possible. The set of items used by the observer effectively

determines, by specifying the behavior domain or space, which dimensions can be measured with the instrument and which cannot.

Originally it was the somewhat immodest goal for the OScAR project ultimately to produce a taxonomy of behavior items sufficiently varied so that a measure could be defined in the taxonomy along any important dimension on which classrooms differ. It did not take very much experience to convince us that this scheme was impractical. A project carried out with a similar objective at the Stanford Center for Research and Development in Teaching (Baral, Snow, & Allen, 1968) has not reached this goal either. The very size and nature of the taxonomy they have produced without succeeding, reinforce us in our conclusion that the idea is impractical.

Since we cannot exhaust the domain of classroom behaviors, we must resign ourselves to sampling it--not in a random fashion but in a way chosen to achieve a particular purpose, leading, therefore, to a biased sample. The sample is biased (hopefully) to yield maximal information about those dimensions in which the constructor of the instrument is most interested and to neglect all others.

In a project like the present one in which the need is for a comprehensive measure of a child's school experience, however, it becomes important to include almost any item anyone has ever suggested might be important.

These, somewhat sketchily stated, are the considerations which led us to specify for this study an instrument which would contain the widest possible variety of items related to young children's experiences in their first years in the classroom, items which in themselves might be of low discriminating power, and which might appear to be of limited intrinsic interest or importance, but which can be combined into composites which do discriminate reliably along scales or dimensions which are interesting and important. Before turning to a description of the nature and genesis of the instrument developed for the project, it ought to be mentioned, perhaps, that other information relevant to the impact of the classroom on the pupil is to be collected by other members of the project staff and will be incorporated into whatever interpretations are made of the observational data proper. Reference here is to such things as the physical, ethnic, and SES characteristics of the pupil and the peer group, and to classroom characteristics such as facilities, space, curricular content and the like.

Observation Strategies

The title we have assigned to the instrument constructed for this project--the Personal Record of School Experience (PROSE)--suggests what it is designed to do: to yield a record of the experiences the individual child has in school, a record which can be scored on as many different dimensions as possible, which can be factor analyzed and item analyzed; in other words,

one which can be used in whatever way the demands of the study dictate.

In presenting a brief account of the development of the instrument, and some of the rationale underlying it, it is convenient (if not logical) to begin by discussing its format.

In planning the observational procedure we took as a model the procedure used in most educational and psychological measuring devices--in particular,in objective tests. The steps in this procedure are seen to be as follows:

1. obtaining a behavior sample;
2. making an objective record of the behaviors; and
3. scoring the record in such a way as to describe the behavior in terms of one or more behavior dimensions.

In the case of an objective test, the sample of behaviors is obtained by administering the test--that is, by getting the examinee to answer the questions. The record of behavior is normally obtained by having the examinee make marks in certain places on an answer sheet. Scoring is accomplished by a clerical or mechanical comparison of the record with a key which ascertains the number of points of agreement between record and key.

When we construct an objective test, we arrange things so that the behaviors the test elicits produce a record pre-coded in such a way that scoring is an objective process. This requirement imposes some rather stringent restrictions on the range of behaviors that we are able to measure directly; but the gain in objectivity and in convenience in processing the information obtained have resulted in very wide use of such instruments.

In the case of the Personal Record of School Experience, the behavior sample will be obtained by observing a random sample of the actual behaviors of the pupil in school. The record of the behavior will be made, not by the pupil but by a trained observer who will make marks in certain places on a PROSE form similar to an answer sheet. Scoring will be accomplished by a mechanical comparison between the record and keys to be constructed later.

From the foregoing it should be apparent that the role of the observer is to make a record of behavior; i.e., to classify the phenomena he sees into the categories specified on the schedule and record the category into which each event falls. At the end of a period of observation, the record will show the relative frequency of events which have occurred which were classifiable in each category.

The observer will and should play no part in the interpretation of the record as a whole or of the significance of any event on it as far as the study goes. For this reason, we prefer to recruit observers who are naive in areas related to the purpose of the study. An observer trained in pedagogy or

psychology is likely to have more difficulty avoiding the temptation to guess at the meaning of what he sees than a relatively unsophisticated recorder would have, and might therefore find it more difficult to learn to use the PROSE form and be comfortable with his restricted role.

At one point in our analysis of the needs of the longitudinal study in this area, we considered briefly the possibility of using an ecological approach; i.e., sending in an observer who would dictate into a tape recorder a detailed narrative account of what he saw happening to the pupil being observed. The idea had its attractions--such records generally are rich in detail and interesting to read. But before they could be used in the kind of analysis this study calls for, these records would have to be coded into quantifiable form. And the amount and quality of usable information that can be extracted from even a very good ecological record is surprisingly restricted. Most of the rich and interesting details turn out to be irrelevant to the coder's task, and the one minor detail not included may turn out to be crucial.

We decided, instead, to try to send the coder into the classroom so he could have direct access to the behaviors to be coded, and to ask him to produce for us a document which would simulate an ecological record but be precoded into quantifiable form. The information in a PROSE record bears much the same relationship to an ecological record that an objective test paper bears to an essay examination. The former is not as rich or detailed as the latter, but the relevance of the data it contains is under much better control, and the greater detail the latter may contain is often irrelevant, or at best somewhat difficult to quantify reliably.

We may view the PROSE recorder's task as that of observing what happens to a certain pupil at a certain point in time, and then writing down a "statement" describing that event. The statement consists of 11 "words"--each word being one of the alternatives to a single item on the PROSE form. The recorder decides which of the four alternatives to Item 1 (if any) best describes the event in question, and marks that alternative (or leaves all four blank). He repeats this process on items 2 to 11 for each event to be recorded.

Let me illustrate the process by describing how an interaction between two pupils would be recorded. (It will be helpful to refer to the accompanying copy of the answer sheet.)

When the PROSE recorder sees the pupil he is observing interact with another pupil, he must decide which of the five terms listed in Item 4 best describes the behavior of the pupil: Aggressive, Initiating, Cooperating, Withdrawing, or Resisting. If the pupil in question approaches the other pupil (whom we shall call the peer), speaks to him, or in some other way establishes contact, the last three alternatives may be rejected as inappropriate. If the approach is hostile or unfriendly, the contact is described as Aggressive and the observer checks AGR. Otherwise, it is described as Initiating, and he marks INIT.

PERSONAL RECORD OF SCHOOL EXPERIENCE

Statement side

Be sure each mark is *dark* and *completely fills* the answer space.
Do not make any stray marks on either side of this sheet.

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
SSID															

		CYCLE A	CYCLE B	CYCLE C	
1.	INIT				INIT
	STAR				STAR
	PART				PART
	LSWT				LSWT
2.	TCHR				TCHR
	AA				AA
	TAA				TAA
	OBS				OBS
	OTH				OTH
3.	POS				POS
	PRM				PRM
	SHTL				SHTL
	LSQU				LSQU
	DO4				DO4
	CNTR				CNTR
	NEG				NEG
4.	AGR				AGR
	INIT				INIT
	COOP				COOP
	WTHD				WTHD
	RST				RST
5.	AGR				AGR
	INIT				INIT
	COOP				COOP
	WTHD				WTHD
	RST				RST

		CYCLE A	CYCLE B	CYCLE C	
6.	CNTC				CNTC
	MTL				MTL
	VBS				VBS
7.	OSOG				OSOG
	OSSG				OSSG
	SSOG				SSOG
	SSSG				SSSG
8.	COOP				COOP
	DSTR				DSTR
	RIS				RIS
	WOA				WOA
	DSRP				DSRP
9.	HIWL				HIWL
	MDWL				MDWL
	HINL				HINL
	MDNL				MDNL
	LOW				LOW
10.	PAINT				PAINT
	DVG				DVG
	CVG				CVG
	WRK				WRK
	KIN				KIN
11.	POS				POS
	NEG				NEG

REMARKS

DO NOT WRITE BELOW THIS LINE

Educational Testing Service
Princeton, N. J. 08540

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Content side

PERSONAL RECORD OF SCHOOL EXPERIENCE

1. ARITH
ARTCRF
EXGM
FRPL
HLTHYG
LANG
MUSRTH
RSTSNK
RTNTRN
SCI
SENS
SOSK
SOST

3. NEXT
NEAR
MID
FRNG
OUT

5 ATT EXC
ATT INS
NSY EXC
NSY BSY
QU BSY
QU IDL

2.		A	B	C
	SHOW			
	TELL			
	LEAD			
	DSCS			
	PEER			
	MNG			
	SPVS			
	RSRCE			
	HSKP			
	INDATT			
	LSWT			
	NCNT			

4.		A	B	C
	ONE			
	TWO			
	3-5			
	6+			
	ALL			

6. USED NUMBERS
USED WORDS
SNG, TKD TO SLF
HELPED OTHER P
COMFORTED P
SHAFF P
ASKED P FOR HELP
REC'D HLP, AFF
REJECTED BY GRP
ACCIDENT, HURT
SHOWED FEAR
CRIED
LOST TEMPER
TATTLED
LED OTHER P
BOSSED OTHER P
WRECKED SOMETHING
REFUSED HELP
RESISTED AD
DISOBEYED
SHOST TO AD
RID
BAD EX
GOOD EX
CHORE, ERRAND
SHAFF AD
WAITED

7.		A	B	C
	CLD4OT			
	THRT			
	LSTMP			
	LFTW			
	PHRSTR			

8.		A	B	C
	ART (PAINT, CLAY)			
	CRAFT			
	MUSICAL INSTR			
	BOOKS, WRITING			
	PUZZLES, QU GAMES			
	BLOCKS			
	WHEEL TOYS			
	TOOLS, WK BENCH			
	SAND			
	GYM, EXERCISE			
	PET			
	CLOTHES, JEWELRY			
	FOOD, WATER			
	DOLLS			
	HOMEMAKING			
	CLEANUP TOOLS			
	AUDIO-VISUAL DEV			
	SP INSTRC DEV			
	SCIENCE EQUIP			
	ASSIGNED SEAT			
	TEACHER'S DESK			
	OPEN AREA			
	TOILET			
	PLAYGROUND			
	OUT OF ROOM			

The same rules would apply if the peer had approached the pupil being observed, but the mark would be made on Item 5 instead of Item 4. All the observer needs to do is to decide which pupil starts things, and whether he did so in an aggressive fashion or not.

To complete the picture, the behavior of the other pupil is recorded by checking one of the remaining three alternatives on the other item. Resisting is used when the pupil's response is hostile, unfriendly, or rejecting. Withdrawing is used when he attempts to avoid or evade interaction or gives in. Cooperating is used when the second pupil does none of these, but responds positively.

The observer then goes to Item 6 and records more information about the interaction. If either pupil touched the other, CNTC is checked. If no physical contact was involved, but the interaction involved the manipulation of materials of some kind--if one pupil handed the other something (or took something away from him), MTL is checked. If neither of these two applies, but one pupil speaks to the other, VRB is marked.

Three additional items may be used for further describing pupil-pupil interactions. Item 7 is used to indicate the sex and ethnic group of the peer; Item 9 to indicate whether and how much the pupil moves; and Item 11 is used if the child laughs, cries, or shows feeling in some other way.

We may think of the six marks an observer makes on these six items as comprising a six-word statement about the interaction which can be represented by a six-digit number. The statement 141211, for example, reads AGR, WTHD, CNTC, OSSG, HIWL, POS. Assuming that we are observing a boy, this could mean that he had run over to a little girl, struck her, and laughed when she ran away. If the recorder saw two boys talking together quietly, he would write 333450. And so on.

For the sake of simplicity, I have described only six of the eleven items actually used in making statements; the other items either add further details about peer interaction or make provisions for describing other kinds of behavior.

Using only these six items, and marking one alternative to each, an observer can record six characteristics of an interaction. While six characteristics do not seem like very many, the fact is that over 3000 different kinds of interactions can be discriminated with these six items alone.

In addition, after he has recorded five statements about a child's behavior during a brief period of time, the observer turns the form over and records background or contextual information, such as the type of lesson being taught, materials used, location, relationship of child to other persons in the class, etc. This makes it possible to interpret most PROSE statements in sufficient detail to reconstruct what happened almost completely. In any case, enough detail is retained for the purposes of the present study.

The conceptualization of the nature and the purpose of the longitudinal study, we have stated, also has implications related to the interpretation of PROSE data.

Although it may be obvious, it is worth emphasizing that analyses of such data should and will lead to results that are directly intelligible to Head Start and nursery school personnel without having to be paraphrased and interpreted for them. The behaviors recorded on the schedule are behaviors a teacher might conceivably observe himself, if their importance were demonstrated to him. Results which recommend courses of action will, by the very nature of the instrument, be expressed in a language very similar to the one teachers themselves use in discussing behavior. There is scarcely a word in the PROSE language that does not occur in the everyday language of the teacher, with almost exactly the meaning it has on the schedule. Results of the various statistical analyses made of the PROSE records should come out of the computer in terms directly related to what pupils, teachers, and teacher aides do (or should do).

One other point related to the uses of PROSE records should be underscored. Although, as we have seen, the individual PROSE statement will often describe an individual event in sufficient detail so that the reader knows almost exactly what happened, this is not the purpose of the observations or the use to which the records will be put.

To the extent to which a pupil's fate is determined by individual traumatic experiences, sudden, once-in-a-lifetime moments of insight, conversion experiences, and the like, his fate will escape prediction from observational records of any sort, PROSE or others.

With any reasonable investment of time and money in observation of pupils, the total percentage of the time any one pupil will be under observation will be miniscule indeed. Consequently, if a pupil has one experience (or two or three) which changes his life drastically, the chances that an observer from the project will be watching at the time are almost zero. To attempt to design an instrument which would recognize and record such events would be a mistake.

What we do have a chance of detecting in our observations are individual events, or sets of similar ones, that recur in the pupil's experience several times, and which have some kind of cumulative effect on him because of this recurrence. The more frequently one event, or one type of event, occurs during a pupil's school experience, the more likely it is that an observer will see and record it at least once. Moreover, the expected value of the proportion of observations during which an event is observed is directly related to the number of times it happens.

However, it is not anticipated that much interpretive use will be made of frequencies of individual items or statements in the pupil's record. In accordance with the discussion of our theoretical position on behavior measurement outlined above, the basic approaches to PROSE interpretation will be in terms of composite

sets of items developed in two ways--a priori and empirical.

By the a priori approach we mean one in which an hypothesized construct or variable is operationally defined by specifying PROSE statements which should occur with different frequencies in the records of pupils who differ on the variable in question. On the basis of such an operational definition a measure of that variable can be constructed a priori and each record may then be scored to obtain from it a measure of that variable.

Table G. 1 shows some examples of a priori keys constructed (rather hastily) for a preliminary form of PROSE and used in a pilot study. In each instance, a group of statements has been chosen which would be made frequently about a pupil possessing a certain trait hypothesized by the builder of the key. Names have been given to the "dimensions," but the best way to figure out what any one of them means is to read the statements which describe how the pupil behaves. Some of these dimensions were found to exist in the sample, some were not. If the data were extensive enough to be dependable, inferences could be drawn from this fact, and those found to exist could be used as variables to be related to other variables of the study.

The seventh scale, Indirect-Direct Influence, exemplifies an attempt to define a dimension of teacher behavior or classroom climate rather than a characteristic of the individual pupil's experience. Such variables would be obtained by scoring all records made of pupils in one classroom as a group to obtain a teacher total.

Empirical scales, as the name suggests, would be developed a posteriori by identifying groups of pupils differing in some respect determined independently of PROSE, such as level of achievement, SES, or perhaps sex; and doing an item analysis. A list of statements which discriminate among the groups would, in effect, be a description of behaviors correlated with the variable originally used in identifying the groups. If the set of statements met certain criteria of internal consistency and stability, it could be regarded as a behavior dimension empirically obtained.

During the summer of 1968 a small pilot study of a preliminary form of the Personal Record of School Experience was conducted to test the feasibility of this kind of instrument.

Two staff members previously unacquainted with the instrument were given a few hours of training in its use. Three or four hours were spent with them viewing videotape recordings made in a Head Start class, and practicing the recording task. One recorder was a graduate research assistant, the other, an undergraduate on a summer appointment.

The two recorders together visited four Head Start classes, once a week for each of four weeks. During each visit each recorder completed one PROSE record.

A reliability coefficient was calculated for each alternative to each item by correlating the total number of times that alternative was checked on the four visits by one recorder with the

Table G.1

SEVEN PRELIMINARY SCALES FOR THE PERSONAL RECORD OF SCHOOL EXPERIENCE, WITH RELIABILITY ESTIMATES

	Items	Weights
1.	Pupil-pupil cooperation (r= .82)*	
	10-3 Pupil cooperates with peer	+1
	11-3 Peer cooperates with pupil	+1
2.	Dominance (r= .00)	
	10-5 Pupil resists peer	+1
	11-4 Peer submits to pupil	+1
	10-4 Pupil submits to peer	-1
	11-5 Peer resists pupil	-1
3.	Misbehavior (r= .82)*	
	3-8 and 4-1 Pupil is criticized by adult	+1
	4-9 Pupil exhibits negative attention getting	+1
4.	Level of participation (r= .79)*	
	4-1 Pupil is star	+1
	4-2 Pupil is cooperating	+1
	4-3 Pupil is paying rapt attention	+1
	4-4 Pupil is listening and watching	+1
	4-5 Pupil is responding to internal stimuli	-1
	4-6 Pupil is watching outside activity	-1
	4-7 Pupil is working on outside activity	-1
	4-8 Pupil is interacting with peer	-1
	4-9 Pupil is exhibiting negative attention getting behavior	-1
5.	Wandered (r= .48)	
	6-1 and 4-5 Pupil is responding to internal stimuli with high activity level and locomotion	+1
	6-3 and 4-5 Pupil is responding to internal stimuli with moderate activity level and locomotion	+1
	8-5 Pupil is outside of group	+1
6.	Divergence (r= .10)	
	1-8 and 9-2 Pupil is working on divergent activity during free play	+1
	1-8 and 9-3 Pupil is working on convergent activity during free play	-1
7.	Indirect-direct influence (r= .00)	
	3-4 Adult is leading discussion	+1
	3-6 Adult is questioning	+1
	3-9 Adult is responding positively	+1
	5-1 Child initiates interaction with adult	+1
	3-1 Adult is demonstrating	-1
	3-2 Adult is informing	-1
	3-3 Adult is leading	-1
	3-7 Adult is directing	-1
	3-8 Adult is responding negatively	-1

*$p < .01$ (one-tailed test)

Table G.2

PERSONAL RECORD OF SCHOOL EXPERIENCE

Item Reliabilities

Category	Item	Reliability
1. Objectives	1. Science	.00
	2. Arithmetic	.00
	3. Social	.18
	4. Language	.73**
	5. Physical	.73**
	6. Process	.00
	7. Rest, snack	.77**
	8. Free play	.83**
	9. Other	.84**
2. Structure	1. Large group with teacher	.86**
	2. Large group without teacher	.82**
	3. Small group with teacher	.00
	4. Small group without teacher	.57*
	5. No adult	.43*
3. Adult role	1. Demonstrating	.73**
	2. Informing	.15**
	3. Leading	.61*
	4. Discussing	.00
	5. Helping	.64**
	6. Questioning	.65**
	7. Directing	.15
	8. Negative	.50*
	9. Positive	.00
4. Participation	1. Star	.44
	2. Cooperating	.57*
	3. Paying rapt attention	.06
	4. Listening and watching	.82*
	5. Responding to internal stimuli	.60*
	6. Watching outside activity	.54*
	7. Working on other activity	.65**
	8. Peer interaction	.77**
	9. Negative attention getting behavior	.77**
5. Adult Interaction	1. Initiation	.71**
	2. Substantive response, positive evaluation	.89**
	3. Substantive response, negative evaluation	.00
	4. Cooperating	.28
	5. Resisting	.00
6. Activity Level	1. High activity with locomotion	.35
	2. High activity without locomotion	.17

(Continued)

Table G.2 (Continued)

Category	Item	Reliability
	3. Moderate activity with locomotion	.47*
	4. Moderate activity without locomotion	.54*
	5. No activity	.92**
7. Manifest affect	1. High positive	.55*
	2. Low positive	.72**
	3. None	.74**
	4. Low negative	.65**
	5. High negative	.00
8. Psychological distance	1. Nearest	.00
	2. Near	.55*
	3. Middle	.85**
	4. Fringe	.15
	5. Outside	.51*
9. Materials	1. Fantasy	.78**
	2. Divergent	.62**
	3. Convergent	.53*
	4. Kinesthetic	.40
	5. Destructive	.00
10. Peer interaction (pupil)	1. Aggression	.54*
	2. Initiation	.46*
	3. Cooperation	.85**
	4. Submission	.00
	5. Resistance	.04
11. Peer interaction (peer)	1. Aggression	.57*
	2. Initiation	.00
	3. Cooperation	.85**
	4. Submission	.00
	5. Resistance	.69**

*$.01 < p < .05$

**$p < .01$ (one-tailed test)

total number of times it was checked by the other, and then stepping the correlation up by the Spearman-Brown formula (except when the correlation was zero). The total number of pupils was 27.

Such a reliability coefficient is analogous to an equivalent-forms reliability: it is attenuated by errors due to instability in behavior of one pupil at different times during the same day or between different days; it is also attenuated by errors due to observer disagreement.

Table G. 2 shows the reliability coefficients of all 67 alternatives. Many of them are high, yet 16 are at or near zero. It seems reasonable that reliable individual differences were found in such things as no activity (6-5) and negative attention-getting behavior (4-9), indicating that such behaviors are stable. Low reliabilities on such items as high negative affect (7-5) and submissive responses to peer (10-4) reflect the fact that these behaviors were observed very rarely.

High reliabilities on items such as time spent in language instruction are somewhat puzzling, since these are teacher behaviors and should not vary from pupil to pupil within classes. The reliability of .73 reported on this item is a mixture of differences between pupils in the same class (within teachers) and differences between pupils in different classes (between teachers). A more elaborate analysis revealed that the reliability with which differences between pupils in the same class were detected was only .61 ($.01 < p < .05$), while the reliability with which differences between teachers were measured was .83 ($p < .01$).

One thing that these results taken as a whole clearly indicate is that PROSE records made by different recorders at different times do detect stable differences between pupils and teachers.

In actual use of PROSE results, it is not anticipated that use will be made of responses on individual alternatives to single items. Rather, it is expected that combinations or patterns of responses to several items will be interpreted as units--that "scales" will be constructed either empirically or a priori to test specific hypotheses about classroom behavior.

To get some notion of the usefulness of the instrument for such applications, seven a priori keys were designed, scored, and their reliabilities estimated in the same fashion, with the results shown in Table G. 1.

The first four scales consisted of clusters of from 2 to 9 items, each of which we expected would be highly intercorrelated because of a common factor we hypothesized in each set. Three of them turned out to be reliable; one did not (presumably because it was based on rarely observed behaviors).

Scales 5 and 6 were based on frequencies of statements of

certain types, rather than individual items. One of these had a reliability which approached significance; one did not.

The seventh scale was designed to measure teacher differences; the reliability coefficient reported does not indicate whether or not it detects teacher differences; further analysis is needed.

To summarize briefly, in this chapter we have presented some of the considerations which led to the development of the Personal Record of School Experience, the instrument designed for the classroom observations in the longitudinal study. We have briefly described the instrument and the way it is to be used, and presented some pilot data which indicate that when used in this way it can yield reliable information about the classroom behaviors of pupils and teachers.

Some Notes on the Relevance of PROSE to the Description of Early Childhood Education Programs

Ruth B. Ekstrom

In his paper on the impact of the classroom, Medley has described the Personal Record of School Experience (PROSE). This instrument is applicable to the description of early childhood education classes, as was demonstrated by its use with Head Start classes in a pilot study. It can be anticipated that some of the types of behavior observed from class to class will vary according to the teacher's particular objectives and techniques, especially as they may have been influenced by her training, her teaching experience, or her participation in an experimental educational program. PROSE is designed to provide quantitative data describing these behavioral differences.

This paper will discuss the types of behavioral differences that might be observed in classes in which the teacher adheres rather rigidly to a particular system of early childhood education. The four systems that have been selected for illustrative purposes are those associated with Carl Bereiter, Susan Gray, Maria Montessori, or Glen Nimnicht. At the same time, it should be stressed that most early childhood education classes do not follow any one approach and tend, instead, to be eclectic in their nature.

The differences among these different curricula will be revealed through both sections of PROSE: (a) the statement section which considers the dynamic aspects of the situation and (b) the context section which considers the more structural elements. A recording cycle of five events involving one child at intervals 25 seconds apart is completed on the statement section before the observer goes to the context section on the back of the record form. Thus, the observer will have been watching the child for more than two minutes before completing the context portion of PROSE.

Academic Emphases

One of the major differences that one observes from one classroom to another is the proportion of time allotted to and the emphasis placed on various areas of instruction. Daily schedules vary widely from one group to another according to the goals and objectives of the teacher. These, in turn, are frequently affected by the philosophy of those by whom she has been trained or those who influenced her through their writings.

PROSE reveals the academic aspects of an early childhood education program through the instruction content and the materials portions of the context section and through the child-material contacts on the statement section. The instructional content item records the instructional objective of the teacher or teacher surrogate who has been interacting with the child. The materials section records the classroom equipment used by

the child during the observation cycle; the child-material contacts section records the manner in which the child utilizes these materials.

In a classroom which shows influences of the philosophy of Bereiter and Engelmann, the observer may find the "target child" in one of the small work groups devoted to intensive academic training in language, arithmetic, and reading. One would expect the PROSE record to show much of the instructional content to be in LANG (language), since reading must be recorded as a language activity, with ARITH (arithmetic) also well represented. Bereiter and Engelmann feel that there is a tendency for preschools to have too many toys. Only a very limited amount of time is allotted to free play within their suggested daily schedule. Even then they state, "Toys should be limited to form boards, jigsaw puzzles, drawing and tracing materials, Cuisenaire rods, and a miniature house, barn, and set of farm animals. Paper, crayons, and chalk (but no paint) should be available for expressive play. Motor toys, such as tricycles and wagons, and climbing equipment are not necessary for the program, but may be required by the sponsoring or licensing agency." (Bereiter & Engelmann, 1966). This would be likely to restrict the materials recorded on PROSE to BOOKS, WRITING (books and writing materials), PUZZLES, QU GAMES (puzzles and quiet games), ART (visual arts materials), and SP INSTRC DEV (special instructional devices). On the child-materials contacts section, one would expect the PROSE record to show many instances of COOP (cooperating), with the pupil doing what he is supposed to do. This section of the record form differentiates between convergent use of material (toward a goal either teacher-set or material bound) and divergent use of material (toward a goal defined by the pupil). The rule-oriented Bereiter classroom would likely yield more instances of CVG (convergent use).

In a classroom which reflects the work of Susan Gray, one would expect to find the instructional objectives, or "aptitudes for achievement" as she calls them, to emphasize perceptual development, concept formation, and language development. The PROSE record would reveal time spent on SENS (sensation) as the teacher tired to teach students to discriminate and differentiate among such stimuli as colors, shapes, and textures. Time spent on language activity would also be significant. The range of materials would be considerably wider than in the Bereiter-oriented class. Gray has described a large variety of materials and activities which are used to implement the Early Training Program. These include:

For language, concepts, and percepts: picture file, picture puzzles, picture sequences, picture sorting, jigsaw puzzles, pegboards, color cones and beads, cubes, flannel boards, counting frame and dominoes, and magnifying glass.

For music and rhythms: group singing, nursery rhymes, rhythmic activities, rhythm instruments, and listening to records and tapes.

For arts and crafts: finger painting, object painting, prints, easel painting, crayons and coloring books, cutting and pasting, construction paper animals, carpentry, and clay.

For large muscle activities: punching bag, jungle gym, ball and basket, relay racing, swimming, small locomotor toys, rocking boat, and rice table (substitute for sand table).

For special activities: housekeeping equipment, grocery store, walks and rides, science activities, field trips, and seasonal activities.

Thus, the observer in a classroom similarily equipped will probably use nearly every material category on PROSE.

The instructional emphases in a Montessori class are motor education, sensory education and music, language, and arithmetic. The PROSE record does not provide an isolated category for motor activities within the description of instructional content, but many of them could be indicated under EXGA (exercise, game) or MUSRTH (music, rhythm). The other instructional content categories marked would probably be SENS (sensation), with less time spent on LANG (language) and ARITH (arithmetic). However, a major differentation between a Montessori class and other classes may slow up in terms of PROSE markings of SP INSTRC DEV (special instructional devices) whenever the target child has been using any of the many special devices seen in Montessori classrooms. Because the children are taught to use these devices in a certain way, this classroom would also be relatively high on the number of instances of CVG (convergent usage) in the child-materials contact section of PROSE.

The instructional content in a classroom which has been influenced by the work of Nimnicht will place emphasis on senses and perceptions, problem solving and concept information, and on verbal skills. Thus, the PROSE categories most frequently checked would likely be SENS (sensation) and LANG (language). Here, again, the use of special equipment, in this case a form of Omar Moore's talking typewriter, may be one of the most conspicuous signs of different instructional orientation. Since Nimnicht stresses self-directed behavior, the child-materials contacts will probably yield more instances of DVG (divergent) usage) than in the classroom where pupil activities are fairly explicitly specified by the teacher.

Attitudinal and Motivational Goals

In addition to the academic-type goals discussed above, most programs of early childhood education also encourage the development of certain kinds of attitudes and motivation. These goals may not be as readily observable as the academic goals but it should be possible to infer them from such PROSE variables as child-adult contacts, pupil-pupil contacts, adult roles, psychological distance, climate, and the behavior signs for both child and adult.

Bereiter and Engelmann stress the development of work motives rather than play motives. They feel, also, that the child should be provided with a realistic definition of success and failure. The motivators which they discuss first are extrinsic rewards, such as cookies, which serve as a bridge to teach the child the meaning of verbal praise and castigation. The nature of the child-adult contacts on PROSE will probably be material or verbal in such a classroom. The behavioral signs, GOOD EX and BAD EX, will be found when the child's work is called to the attention of his peers. Physical punishment and isolation are both used. The Bereiter classroom is highly structured with emphasis being placed on situational rules. The child-adult contacts may often show CNTR (control). The PROSE climate is used to indicate the motivational state of the class as a whole. In the Bereiter classroom, we would expect the record to show a climate of ATT EXC (attentive, excited) or NSY BSY (noisy, busy). The children are often instructed to yell or sing loudly during the periods of academic instruction. "The axiom for the preschool classroom," state Bereiter and Engelmann, "should be: A quiet classroom is an ineffective classroom." (Bereiter & Engelmann, 1966).

Susan Gray describes several "attitudes for achievement" which she stresses in the Early Training Program. These include the development of achievement motivation, delay of gratification, persistence toward a goal, interest in school-type activities, and identification with achieving role models. Like Bereiter, she feels that when first working with youngsters from culturally deprived homes, the best approaches are "nonverbal social reinforcement--patting, hugging, carrying around, letting child sit in his lap--and concrete reward--such as small pieces of candy, cookies, lollipops, balloons, and little plastic toys." (Gray, Klaus, Miller, & Forrester, 1966). However, she feels that the teacher should work toward more verbal rewards, more delayed rewards, greater reward value of "bookish" objects and activities, more specific reinforcement in terms of the child's performance, and increasing selectivity in reinforcement. The PROSE record will likely show all three types of child-adult contact: physical contact, material, and verbal. Because the classroom using the Gray approach is less structured than any of the others discussed here, the occurrence of many more PROSE behavior signs might be expected. The classroom climate will probably be either NSY BSY (noisy, busy) or QU BSY (quiet, busy). The techniques used in working toward internalizing of standards, such as saying "Aren't you proud you can do so-and-so?", might be recorded as POS (positive) child-adult contact on the PROSE record.

The Montessori program stresses the nurture of self-concept, the development of self-discipline, and the cultivation of curiosity. Because the child is expected to work relatively independently, there will probably be fewer instances of pupil-pupil contacts on the PROSE record than in some other preschool programs. The child-adult contacts will be likely to show more instances of STAR, since the teacher will be responding to

children individually rather than in a group. There should be relatively few instances of DO 4 (the teacher doing for the child something that he has been trying or may wish to do for himself) in the statement portion of PROSE recording child-adult interaction. The Montessori program states that self-development replaces the gold star. Thus, the teacher will be more likely to be found in the adult role SPVS (supervising) on the PROSE record. Since the Montessori classroom climate stresses structure combined with freedom, one would expect that QU BSY (quiet, busy) might be the most frequently observed climate on the PROSE record.

Nimnicht stresses the development of a positive self-image on the part of the child as a major objective of his New Nursery. The use of the Responsive Environment types of equipment is intended to develop self-directed and self-rewarding behavior. Thus, the PROSE record for classes using this approach would likely have fewer instances of pupils asking for or receiving help in the behavior signs section. As was mentioned above, in classes which stress the child's independence, relatively few instances of DO 4 should be recorded. Nimnicht feels that there should be no gushing approval, warm pats on the back, or little gold stars. The emphasis is on internal rather than external rewards for learning in the classroom using this philosophy. Thus, the record would probably show the pupil behavior to be more self-directed with relatively few instances of MNG (manage) in the adult role or CNTR (control) in the child-adult interaction section of the PROSE record.

Teaching Methods

In addition to the different goals espoused by these four preschool programs, each of them utilizes widely differing methods to reach its particular ends. These methods will be revealed chiefly through child-adult contacts, adult roles, grouping, and the behavior signs for adult behaviors.

Bereiter and Engelmann list eighteen specific techniques or teaching strategies. A number of these can be closely related to the PROSE record. For example:

"Adhere to a rigid, repetitive presentation pattern."

The PROSE record in the statement cycles should show several instances of the same verbal behavior from the child in a group responding to the teacher.

"Never work with a child individually in a study group for more than about 30 seconds."

The PROSE statement cycles should not show two successive cycles of the child being STAR while he is also indicated in the context section as being part of a group.

"Use questions liberally."

The PROSE record should contain more examples of LSQU (listening to pupils or asking a question) than would be found in other classes.

"Use short explanations."

There should be fewer cycles of SHTL (showing and telling) within the child-adult interactions than in other classes and also fewer instances of TELL under adult rolls.

The adult-child contacts will likely show the child in the Bereiter classroom to be PART of a group with the teacher reacting to him by LSQU (listening and questioning). The most frequently found adult role will probably be LEAD. The largest portion of time spent by the child in the Bereiter classroom is in the small groups of about five children for specific instruction in language, reading, or arithmetic.

In a classroom using the methods discussed by Susan Gray, the child-adult contacts on PROSE may show more instances of INIT (pupil initiated contacts) or STAR (teacher giving individual attention to the child). These contacts will likely contain more examples POS (positive expression of feeling), PRM (permissive), and DO 4 than will the other preschools discussed here. This type of class is the only one discussed here where the observer might expect to find the teacher working with all of the children at one time. Because of the less structured natured of this program, there may be more instances of any or all of the adult behavior signs described in the context section of PROSE, than would occur in programs which are more highly structured.

In the Montessori program, the teacher functions as a programmer of pupil behavior. Her adult role on the PROSE record would probably be either MNG (manage) or SPVS (supervise). The children are encouraged to work independently in the Montessori classroom, so that the group size indicated on PROSE will often be ONE. It might be expected that, because of the structured nature of this program, few of the adult behavior signs on the PROSE context section might be observed. Because the Montessori method stresses the "lesson of silence", the classroom climate recorded should be QU BSY (quiet, busy).

Nimnicht also emphasizes self-directed pupil behavior but because the methodology stresses child-machine interaction, the teacher's role, as indicated on the PROSE record, should be RSRCE (resource) where the pupils are working and the adult is available for help when asked, but does not go to the pupil and offer it. The teacher role may also include MNG. There will likely be few instances of DSCS (discuss) when there is a pupil-teacher dialogue. Children should be found working in groups of ONE in a QU BSY classroom climate.

Conclusions

In conclusion, it appears as if many of the types of behavior identified and recorded on the PROSE form can be found in preschool programs and that discriminations among programs can be made. The examples given here are probably not typical of most classes in early childhood education but, instead, represent rather widely divergent approaches. In most preschool programs the teacher will probably use a much more eclectic philosophy. However, the types of behaviors recorded on PROSE can be expected to show some variation according to the academic goals, the attitudes and motivations, and the teaching methods employed by the particular teacher.

H. THE IMPACT OF THE TEACHER

General Considerations

Samuel Ball

> You make a great, a very great mistake, if you think that psychology, being the science of mind's laws, is something from which you can deduce ... methods of instruction .... Teaching is an art; and sciences never generate arts directly out of themselves. An intermediary inventive mind must make the application, by using its originality.
>
> (William James, 1899)

Whether teaching is indeed an art or whether it is a science is a moot point (Skinner, 1968). Certainly the teacher--be he scientist, artist, or some combination of the two--is an important element in the educational process. Indeed, with characteristic rhetoric, Bruner (1960) claims: "The teacher is ... an immediately personal symbol of the educational process ... ."

In this longitudinal study it is important to consider at the outset the domain of variables that can be abstracted from the role of the teacher. We need to know what constitutes the "immediately personal symbol" and what characteristics other than an "inventive mind" a teacher needs to have; i.e., we need to be able to describe comprehensively the important parameters of the teacher. With this knowledge we will be able to make educationally-useful comparisons; e.g., the preschool teacher as compared with the elementary school teacher; the teacher in the rural south as compared with the teacher in the urban north. We will also be able to investigate, perhaps more thoroughly than in a cross-sectional study, aspects of teacher background, belief, and behavior which are related to certain sorts of progress in certain children.

A quick perusal of the index of almost any introductory textbook in educational psychology provides crude evidence of the wide range of the teacher domain, e.g.,

> Teacher Characteristics Study
> teacher, characteristics of the,
> as a clinician,
> and effectiveness of teacher method,
> creativity in the,
> and effectiveness of pupil-centered curriculum,
> identification with the,
> mental health of the,
> patterns of classroom behavior,

relation with others,
selection of,
effectiveness of,
see also teacher, role of
teacher, role of the, in attitude and character development
in classroom effectiveness,
in concept formation,
in developmental tasks,
in emotional and social maturity,
in guidance of learning activities,
in individual differences ...
[and so on for 15 more lines]
teacher-made tests,
teacher-centered curriculum,
teaching as an art and a science,
theories of,
teaching machines, basic issues
hardware of,
psychology of,
teaching profession, (Mouly, 1968)

In order to conceptualize the teacher domain in a more meaningful manner than mere alphabetical indexing by subtopic, it is initially necessary to make some relatively arbitrary decisions--that is to say, the teacher domain "pie" can be "cut" into "slices" in a number of different ways. It is hoped that the way selected here is for our purposes a fruitful one, to carry the metaphor, perhaps, further than it ought to be carried.

In the rest of this paper it will be argued that the teacher domain can be divided into two major sections. First, the teacher can be thought of as a person in her own right and therefore with personal characteristics (e.g., age, size, sex, race, and economic status). As a person, she also has knowledge and skills in varying degrees, and values and attitudes of varying strengths. Her knowledge can be thought of both in terms of its width and depth. It has specific content in the areas she teaches and in the areas of the foundations of education. An examination of teacher education programs suggests that we value both general knowledge and specific subject area and foundational knowledge in our teachers (Trow, 1960). Her skills include cognitive skills (e.g., problem-solving, reasoning, conceptualizing), social skills (e.g., getting along with others, flexibility in role playing, leadership qualities), and psychomotor skills (e.g., grace of movement, writing ability, ability to put objects together). Her values and attitudes are in general as wide-ranging as any other adult person in her society, but especially important are her attitudes towards children and her profession and her values in the area of education and its major goals and functions.

Second, the teacher, as well as being a person in her own right with her own set of knowledge, skills, values, and attitudes, can be thought of in terms of how she plays the various roles our society calls on her as a teacher to perform. Being able to play the role is a partial indicator of her ability to define it accurately in terms of the society's conceptualization of it (Waller, 1932).

Sawrey and Telford (1964) present a list of teacher roles under the non-comprehensive headings:

> Negative roles (e.g., scapegoat, detective, disciplinarian)
> Authoritarian roles (e.g., parental surrogate, dispenser of knowledge, model citizen)
> Supporting roles (e.g., therapist, friend, confidant)

The roles a teacher chooses to emphasize and the manner and flexibility with which she plays them are what we mean by teaching style. Specifically, we would be interested in such questions as these: Does the teacher give indiscriminate praise? Does the teacher structure the lesson rigidly? Does the teacher lead groups in such a way as to develop common purposes?

The domain of the teacher as conceptualized in this chapter is outlined in summary form in Table H.1.

An objection might be legitimately raised that these factors constituting the teacher domain have already been the subject of research and that this research has provided few useful conclusions. One reason for this lack of useful research findings concerning the teacher is that the approach has been too global (e.g., are deductive teaching methods "better" than inductive teaching methods?). As was pointed out at the beginning of this chapter, what is important is to discover the interactions among the goals of the curriculum (purpose of the teaching), teaching styles, and pupil characteristics with a view towards identifying the most efficient interactions. A second reason is that until the last decade means of describing classroom interactions have been unavailable. Finally there is reasonable doubt as to whether in fact the teacher has been the subject of such intensive empirical investigation as is sometimes claimed. As Jackson (1966) optimistically laments:

> Indeed, someday teachers may even become as popular, as objects of study, as birds. Surely anyone who has tried to watch both kinds of creatures knows that the antics of the red-tufted woodpecker and his offspring are often dull in comparison with those of the low-heeled pencil-tapper and her brood of second graders.

Table H.1

A SUMMARY OF THE CONCEPTUALIZATION OF THE TEACHER DOMAIN

The teacher	
I. The person	II. The role
(a) personal characteristics (age, sex, race, years of teaching, etc.)	(a) negative roles (scapegoat, detective, etc.)
(b) general knowledge, specific competence in areas of teaching, understanding of foundational areas	(b) authoritarian roles (parental surrogate, model citizen, etc.)
(c) skills in reasoning, problem solving, conceptualization, in social areas and psychomotor tasks	(c) supporting roles (therapist, friend, confidant, etc.)
(d) values concerning education and its purposes, attitudes toward children, race, etc.	(d) flexibility of role playing
	(e) roles emphasized

Measurement Strategies

George Temp and Samuel Ball

The measurement of the impact of the teacher is not solely the province of this task force. The school, the classroom, and the personal-social task forces will be providing data of considerable value to our understanding of the teacher variable. For example, the personal-social task force will obtain attitudinal data from the children about the teacher, the classroom task force will obtain evidence about what is occurring in the classroom, and the school task force will obtain data about the emotional and social climate in which the teacher is operating.

What specifically delimits the measurement strategy of the teacher task force is that the data collected are obtained directly from the teacher. In the later analyses, when the problem arises of relating teacher variables to student variables or contrasting one group of teachers with another group of teachers, data will be used regardless of which task force was responsible for the instrument.

The specific instruments proposed have been grouped into five parts. The major teacher domain which each instrument taps is indicated in parentheses, and the numeric-alphabetic notation refers to Table H.1 in the previous section of this chapter.

Part I
Background Information and Description Survey [I(a) and (d)]

Part II
Classroom Dimensions of Teaching Style [II(e)]
Approach to Teaching [I(a) and II(a), (b), (c)]
Teacher Individuation of Pupils [II(d)]
This I Believe [I(c) and (d)] or The Conceptual Systems Test [I(c) and (d)]

Part III
Estimate of Time Spent on Certain Instructional Activities [II(e)]

Part IV
Intelligence Estimate [I(b) and (c)]

Part V
Perception of Disadvantaged Students [I(d)]
Polarity Scale [I(d)]

It may be noted by reference to Table H.1 that each area within the teacher domain has been sampled by the proposed measuring instruments. It is no coincidence that the most intensive sampling occurs in I(d)--values concerning education and its purposes; attitudes toward children, race, etc. The reason is that at the present time considerable stress is being placed on this area by authorities on effective teaching of disadvantaged children.

Again, however, it should be stressed that the proposed measures outlined here are not the only means whereby the teacher will be investigated. Classroom and school task forces, specifically, will also be obtaining data on the teacher. In fact, a useful by-product of this study will be to investigate discrepancies among a teacher's stated views, her classroom behavior, and the opinions about her held by the school administration.

I. THE IMPACT OF THE SCHOOL

General Considerations

Samuel Ball and Marshall Smith

One of the major factors operating in the educational process is the school. In order to study the school's effects on the educational process, adequate measuring instruments for the independent variable (the school) have to be developed. At this point, however, a conceptual problem occurs. While the school can be thought of in molar terms, it also has such connotative and denotative richness as to enable it to be viewed molecularly. The purpose of this section is to develop a theoretical structure of the school domain within which molecular components important to the educational process can be identified. With this product the researcher will be able to see what aspects of the school can be measured with available measuring instruments. He may then decide what new instruments need to be developed to obtain measures of the additional school components he wishes to study. In addition, a theoretical mapping of the school domain will enable him to make more informed decisions about the research he wishes to conduct.

The school is a complex social system which institutionalizes the desire of the society to perpetuate itself in some form (Goslin, 1965). This is carried forward by the formal education of its children in the relatively stereotyped environment of the school building. While this building may be large or small, old or new, internally flexible or rigid as to function, well-equipped or relatively bare of needed equipment, the fact remains that the school's purpose and its function are the perpetuation of the society in which it exists. In fact, one method of examining the knowledge, values, skills, attitudes, and goals of a society--indeed of examining the cultural heritage and status of a society--would simply be to study what happens in that society's schools. The resultant picture, however, would not be a clear one since the school is rarely a true mirror of its society. Some schools tend to reflect the society as it was, rather than as it is. Others tend to reflect the society as some members think it ought to be (Russell, 1965).

Society is a relatively abstract concept. It is not the society per se which decides on the processes occurring in the school. Rather, society operates indirectly through the citizens in the community via both formal institutionalized channels such as Boards of Education, and informal channels such as neighborly contacts with school personnel. And each person in the school--the administrator, the teacher, the custodian, the student--brings to the enterprise his own perceptions of the society.

While the three major groupings within a school--administrators, teachers, students--interrelate in many ways which are common to most schools, individuals possess characteristics which exist independently. For example, one administrator may be warm and friendly; another may be cold and impersonal. One teacher may be well-trained and knowledgeable; another may be lacking in training and relatively ignorant of the substance of his subject matter. Some children are obedient and eager to learn; others are negativistic and apathetic towards school learning (Woodring, 1953). At least some of these independent qualities may be of vital importance in determining the impact of the school on the child.

Again, however, administrators, teachers, and students do not normally interact in the school directly. Rather, there are mediating factors operating; for example, the curriculum, the teaching methods, the extracurricular activities, and the testing sessions. Some schools emphasize sports, others emphasize testing of formal knowledge, and still others emphasize processes such as inquiry and data gathering. Schools having such differences in emphasis are identifiable, and it has been shown that they have differential impact on their students (Aikin, 1942).

While this discussion has indicated certain major variables operating upon and within the school, there remains a further means of differentiating among schools. Within each school there are identifiable additional variables which may operate to influence a student's growth. They are not necessarily distinct from the variables already mentioned. In fact, it is axiomatic that all of these variables mutually interact. This additional set of variables might be regarded as the milieu in which the educative process proceeds. Milieu variables include such factors and processes as school spirit, teacher morale, classroom emotional climate, degree of environmental structure, modes of governance and surveillance, reinforcement systems, acceptable hero types, and tolerance of member deviancies (Mayer, 1961). While these milieu variables are probably the most difficult to assess, they constitute a hidden curriculum whose impact is increasingly being thought of as critical to the progress of the child. A special difficulty in assessing the milieu variables is that they are likely to be perceived differently by different members of the school. For example, what some children see as being positive reinforcement may be seen as negative by other children or the teacher. Then not only the institutionalized reward system must be assessed but also the perception of it. Similarly, with acceptable hero types, governance systems, and so forth. One of the most interesting background concerns of this study is the investigation of the preschool as a learning environment. There are a number of obvious surface differences between preschool and public elementary school; e.g., source of funding, location and type of building, training and background of teachers, teacher-pupil ratio, and curriculum. The

Figure I.1

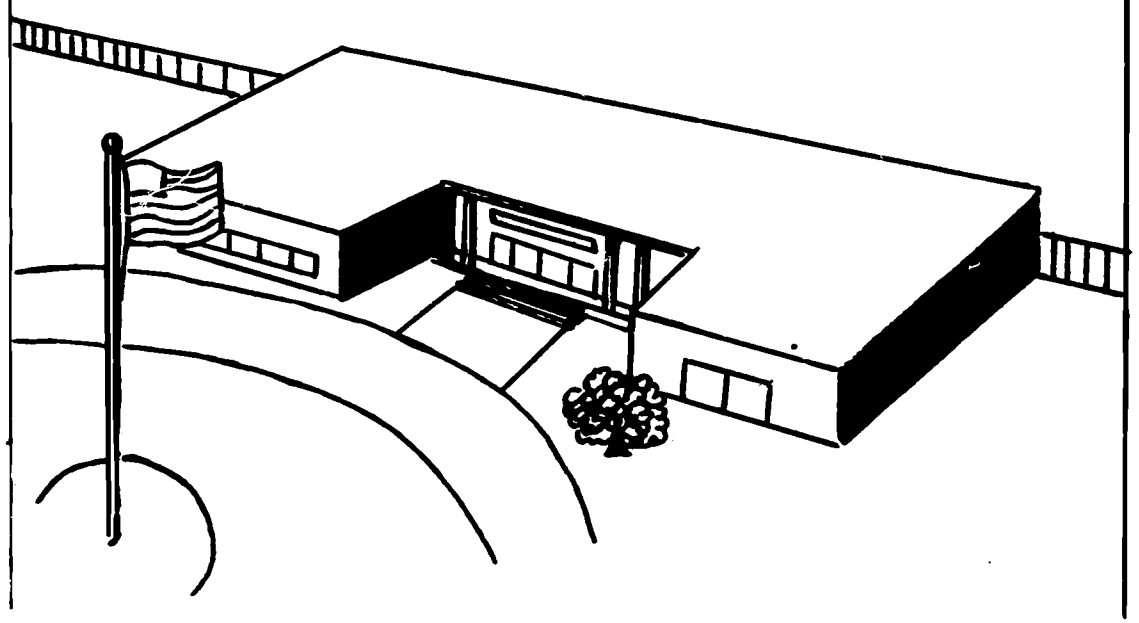
THE SCHOOL DOMAIN

I. Society: how it is represented by the school's aims, functions, curriculum (overall), the school's portrayal of the values of the society.

II. Community: its political and a-political structures as they relate to the school
(a) formally institutionalized; e.g., school boards, P.T.A., accrediting agencies, etc.
(b) informally; e.g., local citizens, store owners, etc.

Relations with supra-agencies

III. The Physical Plant of the School (size, style, adequacy, age, state of repair, space/pupil, equipment, play area, library facilities, etc.). Maintenance services and personnel.



IV. Personnel of the School

(a) Administrative: training and relations with other personnel and community.
Personal qualities.

(b) Teaching: training background, relations with other personnel and community.
Personal qualities.

(c) Student Body: background, SES, relations with other personnel.
Personal qualities.

V. The Operation of the School

(a) Curriculums and methods in the formal classrooms--testing and evaluating procedures.

(b) Extra curricular activities --methods of procedure outside formal classroom.

(c) Special services and classes--adult classes, classes for handicapped, etc.

VI. Factors within the School (The Milieu of the Educational Process)

(a) Morale of teachers and administrators (school spirit at the student's level). Feeling of progress, of fate-control, of positive affect toward the school.	(b) Climate: the social and emotional quality of the school life of its constituents--integrative, positive vs. disintegrative, negative.	(c) Reward Structure --what is good or bad student, teacher, administrator? How are they rewarded and punished?	(d) Governance and surveillance relationships between superordinate and subordinate roles. How do members higher in the hierarchical system supervise the work of those in subordinate positions?	(e) Hero type--who is the idealized student, teacher, administrator hero?	(f) Tolerance of deviancy--is the allowed variance from the norm large or small?

The school diagrammatically presented in terms of its molecular components. (Note that position of these components on the diagram is not meant to imply degree of importance or centrality of the component.)

extent to which the milieu variables also differ from preschool to public elementary school is not as clear. In a longitudinal study there is considerable opportunity to investigate this possible disparity and to relate it to student development in both the cognitive and personal-social domains.

This overall analysis of the school has been graphically presented in Figure I.1. The figure, in attempting to show the major molecular components of the school domain, suffers, of course, from over-simplification. It would be incredible if the complexities of the concept of school could indeed be reduced in this fashion. Nonetheless, it is argued that by the use of this conceptual analysis, research approaches to the school may be sharpened. In the following section the actual measures of the school for the longitudinal study are presented. Their relationship to this conceptual analysis is examined and the rationale for the inclusion and exclusion of measuring instruments is discussed.

Measurement Strategies

Michael Rosenfeld

Anyone who visits more than a few schools, quickly notes how they differ from each other. The major purpose of this task force is to describe the sample of schools and Head Start Centers selected for inclusion in the longitudinal study. This will allow us to identify and document the differences that exist within the study schools and centers. Particular emphasis will be placed on differences between preschool and elementary school as well as on differences among schools by geographic area. The description will focus on the following general variables:

- Physical Facilities
- School Personnel
- Student Information
- Pupil Services
- Special Equipment
- Extra Curricular Activities
- School Expenditures
- School-Community Relations
- Teacher Descriptions of Students, Teachers, and Principals
- Principal Descriptions of Students and Teachers
- Principal Performance Ratings
- Head Start Facilities and Resources

In the past, the gross descriptions of school characteristics (primarily physical aspects of schools) have not shown striking relationship to children's achievement; e.g., the results of Project Talent (Shaycoft, 1967) and the Coleman Study (1966). However, previous studies have not afforded the opportunity to

relate school characteristics to educational process variables or to as wide a variety of pupil variables as the present study encompasses. It is felt that these unique study aspects justify another look at the relationship of school characteristics to student performance.

In addition to describing the physical aspects of schools, attempts will be made to assess the schools' general "tone" or feeling. The inclusion of a school climate variable is based on the assumption that in order to understand the behavior within a school more fully, one needs to be cognizant of more than just what occurs in the classroom. It is felt that an awareness of the "psychological state" of the teachers and principals should be quite useful in understanding and predicting student performance. Recent studies by Halpin (1966) indicate that differences do exist in the organizational climate of elementary schools. Few attempts, however, have been made to relate these differences to student achievement. This study provides an excellent opportunity not only for describing the organizational climate of schools populated by "disadvantaged children" but also for investigating the relationship of climate to student performance.

Thus, the school variables in Table I.1 are classified as descriptive or evaluative. The former refers to the function of describing the schools; the latter to assessing their climates.

In summary then, it is anticipated that the data collected and analyzed by this task force will serve the following functions:

(a) provide a simple description of the sample which will delimit those types of schools to which study results are most likely to generalize.
(b) provide data useful in answering the following questions about study schools (both pre- and elementary schools):
    1. Do study schools differ within each site?
    2. Do study schools differ between sites?
    3. Are differences in schools (both between and within sites) related to pupil performance, characteristics of communities, and other variables of the study?
(c) provide inputs for a satellite study designed to answer the following question: Within each city, are study schools different from schools in non-disadvantaged neighborhoods?

Table I.1

SCHOOL VARIABLES

Variable	Classification		Respondents							
	Narrative Descriptions	Evaluative Perceptions	Principal	Teacher	Records	Superintendent	Parent	Community	ETS Observer	Head Start Director
A. PHYSICAL FACILITIES										
1. Buildings and grounds	X	X	X	X			X	X	X	
a. Age of school buildings										
b. Condition of school buildings										
c. Size of school grounds, district										
d. Student transportation										
2. School facilities	X	X	X				X	X	X	
a. Type of facilities available (cafeteria, auditorium, science laboratory, etc.)										
b. Adequacy of facilities available										
c. Facilities needed										
d. Decision makers concerning facilities										
e. Checklist on classroom facilities										
B. SCHOOL PERSONNEL										
1. Faculty	X	X	X		X					
a. Total number and type of teachers										
b. Racial mix of teaching staff										
c. Teacher employment needs										
d. Teacher turnover										

2. Other school personnel	X		X		X		X					
a. Total number and type												
b. Personnel employment needs												
C. STUDENT INFORMATION												
1. Student characteristics	X						X					
a. Total number of students per grade												
b. Racial mix of student population												
c. Pupil turnover												
d. Rate of absenteeism												
e. Percent of grade repeats												
f. Determinants for school attendance												
D. PUPIL SERVICES												
1. "Special" services	X		X		X	X	X		X			
a. Medical care and treatment												
b. Handling of special groups (retarded, handicapped, etc.)												
2. "Special" personnel	X		X		X		X				X	
a. Types of curriculum specialists available												
b. Availability of special personnel (social workers, medical, etc.) in the school and community												
3. Pupil placement	X						X					
a. Types of school testing programs												
b. Guidelines for pupil placement in special groups												

Continued

Table I.1 (Continued)

SCHOOL VARIABLES

Variable	Classification		Respondents							
	Narrative Descriptions	Evaluative Perceptions	Principal	Teacher	Records	Superintendent	Parent	Community	ETS Observer	Head Start Director
E. SPECIAL EQUIPMENT										
1. Availability of school-owned supplies (books, play materials, art and music materials)	X		X	X						
2. Adequacy of school-owned supplies		X	X	X						
F. EXTRACURRICULAR ACTIVITIES										
1. School sponsored activities (competitive sports, musical performances, etc.)	X		X							
2. Community sponsored activities (boy scouts, girl scouts, etc.)	X		X							
3. Activities sponsored by both the school and the community	X		X							
G. SCHOOL EXPENDITURES										
1. School income	X		X		X					
a. Amount of federal, state, and local support										
b. Type of federal, state, and local support										

2. Salary expenditures	X		X		X								
a. Determinants of faculty and staff salaries													
b. Total expenditures for faculty salaries													
c. Total expenditures for administrative salaries													
d. Total expenditures for staff salaries													
3. Pupil expenditures	X				X								
a. Expenditures per pupil													
H. SCHOOL-COMMUNITY RELATIONS													
1. School-parent interaction	X		X		X	X				X	X		
a. Type													
b. Frequency													
c. Participants (parent-teacher-principal)													
2. School-community interaction	X		X		X	X					X	X	
a. Type													
b. Frequency													
c. Participants													
3. Community perceptions of the school	X		X							X	X	X	
a. Buildings, grounds, and facilities													
b. Effectiveness of administration, faculty, and staff													
c. Service to pupils													
d. Service to parents and community													

Continued

Table I.1 (Continued)

SCHOOL VARIABLES

Variable	Classification		Respondents							
	Narrative Descrip-tions	Evaluative Percep-tions	Principal	Teacher	Records	Super-intendent	Parent	Community	ETS Observer	Head Start Director
4. School perception of the community	X	X	X	X						
a. Interest in pupils and school										
b. Socioeconomic level										
c. Educational level										
d. Physical community characteristics										
I. TEACHER CHARACTERISTICS										
1. Personal (age, sex, marital status, etc.)	X			X	X					
2. Education	X			X	X					
3. Experience	X			X	X					
J. TEACHER DESCRIPTIONS										
1. Of students	X	X		X						
a. Definition of a "good student"										
b. Classroom estimate--"good student"										
c. Definition of a "bad student"										
d. Classroom estimate--"bad student"										
2. Of teachers	X	X		X						
a. Definition of a "good teacher"										
b. School estimate--"good teacher"										
c. Teaching problems										
d. Grading factors										

3. Of principals	X	X		X						
a. Principal's problems										
K. PRINCIPAL'S CHARACTERISTICS										
1. Personal (age, sex, marital status, location of home)	X		X							
2. Education (undergraduate, graduate)	X		X							
3. Experience	X		X							
L. PRINCIPAL'S DESCRIPTIONS										
1. Of teachers	X	X	X							
a. Definition of a "good teacher"										
b. School estimate--"good teacher"										
c. Definition of a "bad teacher"										
d. School estimate--"bad teacher"										
e. Teaching problems										
2. Of students	X	X	X							
a. Definition of a "good student"										
b. School estimate--"good student"										
c. Definition of a "bad student"										
d. School estimate--"bad student"										
3. Of principals	X	X	X							
a. Principal's problems										
b. <u>Principal's Job Description Inventory</u>										
M. PERFORMANCE OF PRINCIPALS										
1. Performance Ratings for School Principals		X	X			X				

Continued

Table I.1 (Continued)

SCHOOL VARIABLES

Variable	Classification		Respondents							
	Narrative Descrip-tions	Evaluative Percep-tions	Principal	Teacher	Records	Super-intendent	Parent	Community	ETS Observer	Head Start Director
2. Principal Behavior Description Questionnaire		X		X						
3. Teacher Reaction Form		X		X						
N. HEAD START CENTER FACILITIES AND RESOURCES										
1. Program personnel	X									X
a. Total number and type of teachers										
b. Basis of teacher selection										
c. Other numbers and type of personnel										
2. Physical facilities	X									X
a. Type of quarters										
b. Type of spaces used in program										
c. Outdoor play area										
d. Type of surface on outdoor play area										
e. Outdoor equipment										
f. Indoor and other play equipment										
3. Student characteristics	X									X
a. Age										
b. Type of home area										
c. Race										
d. Major language spoken										

4. Resources		X											X
a. Teachers													
b. Teacher-aides													
c. Parents													
d. Volunteers													
e. Community resources													
f. Recruitment procedures													
g. School cooperation													
h. Library facilities													
i. Materials and supplies													
j. Transportation													
k. Services													
l. Cultural and recreational trips													

J. THE IMPACT OF THE COMMUNITY

Robert Althauser and Esther Ann Ryan

General Considerations

The domain of the community. The constituent topics, approaches, conceptualizations, and occasional theory which comprise the domain of community studies pose something of a threat to the norm of intellectual coherence. In terms of sociological theory, the issue of community concerns the origins and decline, functional significance and personal meaning of "intermediate associations"--guilds, classes, local communities, churches, unions, voluntary associations, families (Nisbet, 1962). Such associations are necessary as a protective buffer between individuals and overarching centralized organizations like large private bureaucracies and the State, according to the views of mass society theorists (Durkheim, 1949; Kornhauser, 1960).

The more conceptually-oriented Websters among community sociologists have been aroused by the problem of delimiting what constitutes "community phenomenon." Definitions of the essential elements of community (Hiller, 1941; Hillery, 1955; Kaufman, 1959; Sutton & Kolaja, 1960) differentially include aspects of family life, social stratification, and local government. Yet another sociologist pleads the conceptual separation among social rankings based on "local community standing" and two other types of rankings based on family status and social class position (Barber, 1961).

Perhaps the most useful example of these definitions is Reiss's (1959):

> ...a community arises through sharing a limited territorial space for residence and for sustenance, and functions to meet common needs generated in sharing this space by establishing (local) characteristic forms of social action.

As Reiss himself notes, this definition is broad enough to encompass two of the predominant approaches to community study: human ecology and social organization.

Thus, the "limited territorial space for residence" has such ecological features as competition, cooperation, and interdependence. Within this space, ecological processes of concentration, centralization, segregation, invasion, and succession occur (McKenzie, 1926; Park, 1936). Yet this same residential space, and the larger rural or urban population unit (county, metropolis) to which it belongs, has its own particular role in the macro ecological system of this country. Cities have occupational distributions and migration potentials reflecting their particular speciality in this system, such as manufacturing, government, commerce, transportation of goods and people (Duncan, Scott, Lieberson, Duncan, & Winsborough, 1960).

Students of sociologically interesting aspects of residential space have concentrated much of their effort in exploring the relationship between spatial and social characteristics. Part of classical ecology attempted to define "natural areas" in urban settings ("...spatial units limited by natural boundaries enclosing a homogeneous population with a characteristic moral order." Hatt, 1946) in some systematic way. This attempt bred two intellectual offsprings: a second generation of ecologically-oriented sociologists tried in "social area analysis" to define such areas using factor analyses of census data (Bell, 1959; Bell & Greer, 1962; Van Arsdol, Camilleri, & Schmid, 1958); and some rural sociologists (Sanderson, 1939) and sociocultural ecologists (Ross, 1962) have attempted to delineate the physical boundaries of rural and urban communities. Various city planning experts, prominent among them Jacobs (1961), have shared similar concerns for the effects of spatial and social characteristics of residential areas on the quality of social interaction among residents.

Other sociologists have concentrated on the symbolic and cultural values associated with spatial areas (Firey, 1945, 1947), the residential segregation of occupational groups (Duncan & Duncan, 1955), racial and ethnic segregation (Beshers, 1962; Lieberson, 1963), and the relative impact of income and education on grade of residence (Tilley, 1961).

Returning to Reiss's definition, the social organization approach to community emerges in the concepts of characteristic local forms of social action and identification, with institutions, and formal and informal organizations being established to meet common needs. The collection of studies within this approach is considerably more variegated than within the ecological stance.

Here, the notion of community as a small locality is researched in terms of individual interaction among neighbors and relatives (Greer & Kube, 1959; Litwak, 1960; Smith, Form, & Stone, 1954) and of "social participation" within small voluntary associations and clubs (Greer, 1962). Larger numbers of studies cluster about three large topics:

(a) social stratification within and between communities (Form & Stone, 1957; Hollingshead, 1961; Lynd & Lynd, 1929; Pfautz & Duncan, 1950; Warner, 1941);
(b) community power structures and modes of decision making (Hawley, 1963; Hunter, 1953; Pellegrin & Coates, 1956; Rossi, 1957);
(c) racial and ethnic relations and processes of acculturation and assimiliation within communities (Gans, 1962; Rosenthal, 1960; Spire, 1955).

All three of these basic concerns delineate numerous social forces within and external to the residents of small territorial spaces which profoundly structure their lives.

There are other approaches and concerns (delinquency and deviance; community conflict; urbanism as a "way of life") that could be mentioned. It seems more important, however, to keep in mind the diversity and multitude of factors which differentiate

and operate in communities. Broadly speaking, there are those external to and impinging on small local communities (urban or rural): The ecological role of the larger population unit as mentioned; the national, state, and metropolitan governmental organizations (concerned with welfare, health, urban renewal, etc.) which service the local community with their programs; and non-local (often absentee-owned) business and industry organizations, unions, philanthropic foundations (e.g., Ford Foundation activities in Ocean Hill-Brownsville), and religious hierarchies.

There are other micro factors internal to such communities and impinging on their members: the existing physical layout and structural arrangement of streets, parks, schools, and playgrounds; the administration of local urban services--welfare, sanitation, public safety, education--which materially and psychologically support the residents of an area; the local demographic characteristics of the population, the existing local rates of crime and vice, gambling, disease, migration, employment, welfare; the operation and vitality of numerous local formal and informal organizations: voluntary, political, religious, work or leisure oriented groups, honorary societies, fraternities and sororities; numerous family characteristics like ethnic and class and religious identifications; the geographic and ethnic origins and migration behavior of local residents.

The community and the criterion variables of this study. In the following section ("Measurement Strategies") a selection of these and other factors (from the ecological and social organizational approaches) is made in terms of the criterion variables of this study. We pose two basic questions in the meantime: what relationships between these variables and community variables have been illuminated in the sociological or psychological literature; and why, in view of the literature of past studies, should we study community variables? The answer to the first question, we shall see, only partly answers the second.

It must be observed that the preponderance of existing literature has apparently seriously neglected, if not ignored, the effects of such community variables as we discuss below on children's growth and education. To cite a famous study as a typical example, the closest the Coleman study (1966) comes to including such variables is in the characterization of school environment (in particular, the individual child's home background, and the social-educational characteristics of parents) and in the characterization of schools as located in metropolitan and non-metropolitan regions of the country.

Further, in the summary report of this study, we learn that

> A pupil attitude factor, which appears to have a stronger relationship to achievement than do all the "school factors" together, is the extent to which an individual feels that he has some control over his own destiny....The responses of pupils...show that the minority pupils, except for Orientals, have far less conviction than whites that they can affect their own environments and futures.

But what do we also learn about the community environment in which the pupil or his parents affect their "destiny"? What kind of variation in community variables affects variation in control over environment within minority or majority pupil groups?

Similarly, a host of other studies (Almy, 1966; Hess & Shipman, 1968; Keller, 1963; Milner, 1951) characterize their subjects--school children--as middle or lower class, without examining the extra-familial community environment in which these class members or their parents reside, and from which both pupils and parents derive what measure of dignity and support they can. As noted in more than one of the broader theoretical concerns below, it may be seriously misleading to interpret the relationships between such individual characteristics and the usual cognitive and psychological dependent variables without considering the direct and interactive impact of aggregative community characteristics.

In addition, there are at least two other basic reasons for studying community variables in this study. This task force has been given the responsibility of including measures which will permit the characterization and description of the different communities within the study sites. Beyond the use of our data for descriptive purposes, however, lies an equally important task engendered by the study's interest in the effects of Head Start programs. Some of the previous Head Start studies, prominent among them the one reported by Coleman (1966), have encountered the problem of selection which overshadows previous concern with the improvement of the child's educational abilities. Given what has been found about such improvement, a very large question remaining is what factors select out the families and children which enter Head Start programs in the first place. Community data of the sort we propose to collect should go a long way toward giving much more concrete answers to this question.

The broader theoretical issues. To balance out the discussion above of conceptualization of community, some attention should be given to the kinds of broader issues which suggest the most interesting kinds of theoretical relationships between the types of community factors on which we can obtain data. These are the theoretical concerns which articulate the discussion of specific topics and variables that follows.

A. A probable topic of interest in several of the other domains of this study is the perceptions of the individuals--parents and children--under study: self-perceptions, parents' perceptions of children and of differences between their children, perceptions of schools, friends, neighbors, and families. In more abstract fashion, we can add perceptions of their control over the environment, identifications of various sorts, etc. Yet these perceptions exist, not simply as internal psychological states, but in the context of objective conditions, and the impact of perceptions can operate in ways (a) consistent with, or (b) inconsistent with and, indeed, against the impact of, objective conditions.

This task force is particularly interested in obtaining data on such objective conditions and in analyzing the effects of interaction between objective conditions and perceptions of such conditions and other perceptions. Interesting general questions include the differential distribution of inconsistent perceptions among diverse social groups. Perhaps we can learn and partially account for those who hold perceptions particularly inconsistent with objective conditions, and what effects this inconsistency has.

B. The communities and subcommunities within the urban and rural areas to be sampled differentiate themselves according to the extent to which they provide supportive and nonproblematic, or scrutinizing and even tense environments. What kind of environment depends on a variety of factors including the physical layout, physical conditions, land use patterns, socioeconomic heterogeneity of such areas. It is important but not sufficient to ascertain the subjective end-products of such variation in parent and child attitudes (feelings of control and the like). In addition, we would like to seek some empirical understanding of the particular configurations of factors which contribute to such psychological states of mind. In particular, we are interested in the extent to which some of the factors above encourage conditions in which extra-familial members of a community may serve as a kind of surrogate family to the parents and children of an area.

C. Perhaps the most basic analytical "move" familiar to students of community variables is the one in which individuals and their characteristics are compared and jointly analyzed with the characteristics of aggregates of individuals (Blau, 1960; Davis, Spaeth, & Husen, 1961). How congruent, or similar, or socially homogeneous is any given parent or child relative to the collectivity of typical social characteristics, attitudes and perceptions, and norms surrounding that parent or child? Because the behavior of the individual is jointly determined by (a) his characteristics and (b) those of the surrounding aggregate, it makes little sense to indulge in incomplete and possibly mistaken interpretations of data by considering only the first of these two determinants.

D. Much is commonsensically "understood" or inferred by some macro or ecologically oriented sociologists about the relation between physical conditions of residence and community and a host of behavioral events; e.g., population density and rates of crime and disease. Where the concern of this study focuses on the growth and learning events in the lives of small children, however, it seems imperative to augment the sometimes

vague, intervening variables assumed to be working between physical conditions and such events. These intervening variables may, themselves, be micro behavioral events. An example could be plausibly invented with reference to one reading readiness study. One could hypothesize that population density or person per room density in an area would affect the likelihood of children eating meals with their parents, which, in turn, affects reading readiness according to Milner (1951). Typically, she did not include density or any other community variable in her study.

E. Our sampling will very likely encompass residential areas quite varied in the degree to which their inhabitants have a sense of common racial, ethnic, religious or other localized identification. It is quite possible that the parent's sense of dignity, confidence, and control over environment might be specific to his area of local identification, and more or less solely derived from experiences within that area; hence the determination of a parent's "routine community area" suggested later. On the other hand, a parent's sense of control and identification may extend to the wider metropolis in which he lives, in and out of which he moves and perhaps works.

Taking such an approach, we can then investigate the effects of a parent's comparative identification with, and confidence and security within, the local and metropolitan system. Which type of identification, which referent of confidence and control has the greatest effect on the parent's occupational achievement, and on his children's sense of control and dignity? Could too much security in the local urban community have as deleterious an impact as too much insecurity in the larger metropolitan area?

Measurement Strategies

> In the last analysis, as comparative studies in child training have convinced us, the kind and degree of a sense of autonomy which parents are able to grant their small children depends on the dignity and sense of personal independence they derive from their own lives...the child's sense of autonomy is a reflection of the parent's dignity (Erikson, 1968).

I. Purview of a community task force

Those factors in extra-familial and community life which we can expect to shape the GROWTH and EDUCATION of small children, directly or through the effects of parents on their

children, include the following:

A. selected physical characteristics and facilities of community areas,
B. selected social characteristics of the population in the areas sampled,
C. selected social characteristics of the children's parents,
D. the "routine community area" of parents: just how large and where bounded is that area in which the routine experiences of a parent transpire,
E. selected perceptions which service workers and other governmental representatives have of a community and its residents.

We will assume at the outset, following Erikson (and Gurin & Katz, 1966), that all these factors exert at least part of their influence on the child's cognitive ability, personal-social "strength," and physical condition through two immediately anterior intervening variables: a parent's self-conception (a parent's sense of dignity, his self-conception vis-a-vis the wider community, as provider and mediator of extra-familial events and forces on the family and child, his sense of control over his environment, of confidence and security) and the child's self-conception.

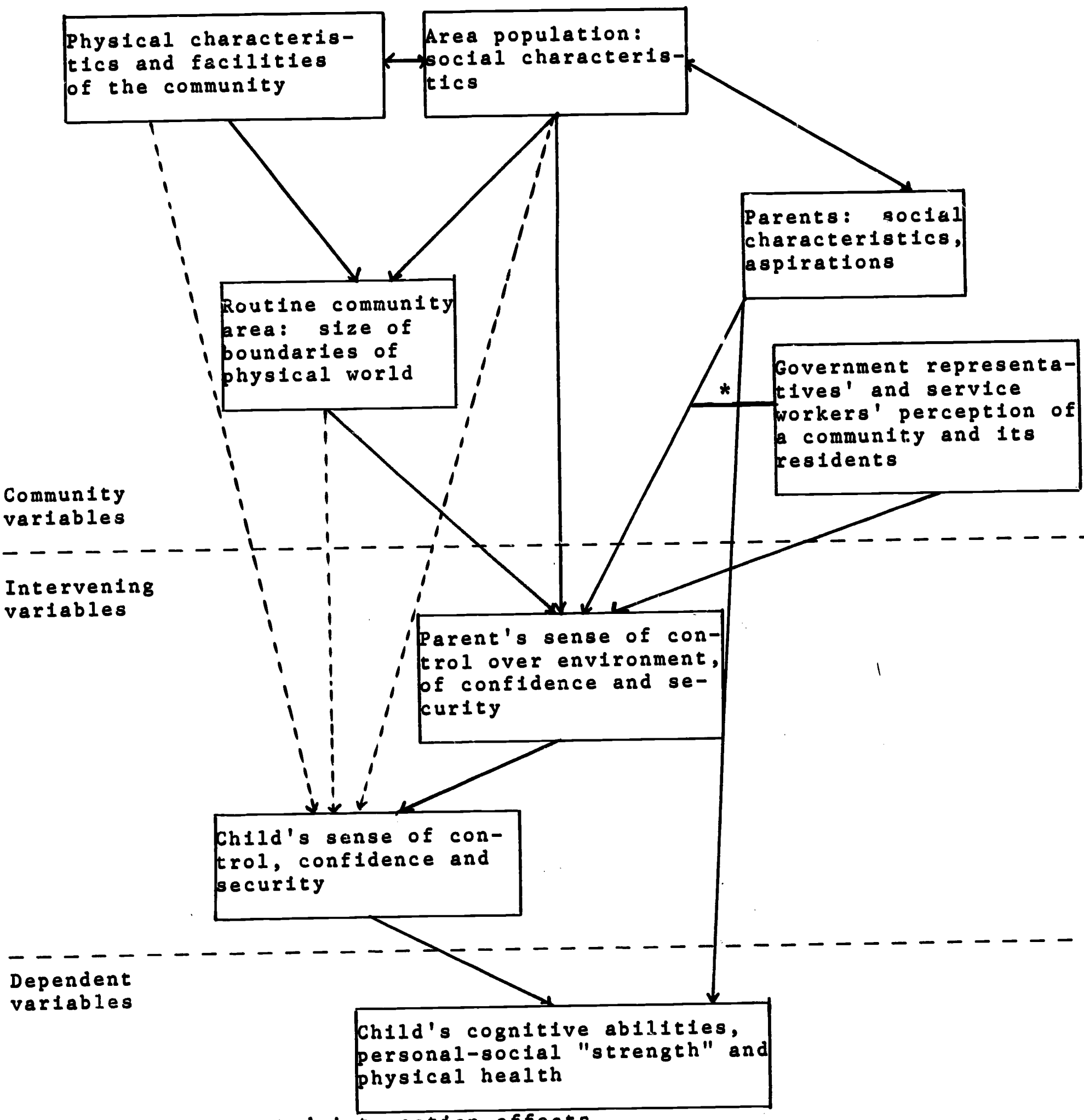
The general hypothesis, reflected in Figure J.1, of probable relationships between the community variables and intervening and dependent variables, is that a parent's posture of confidence, his sense that his community area is nonproblematic, safe, supportive, controllable, or predictable, is variously encouraged or discouraged by these community factors. In the early years of the children's lives, we would expect that the child's self-conceptions corresponding to his parents' self-conceptions are in large measure derived from his parents' self-conceptions. As children age in the later years of this study, an increase in the direct impact of the community variables can be expected, as the community becomes an increasingly real and independently encountered environment for the children.

Other task forces in this study will, no doubt, have their own interests in and measures of various self-conceptions and perceptions of parents; most of these will probably be theoretically suitable for analysis in conjunction with the variables proposed below. Within the framework of community study, however, we will propose a few measures of our own, sprinkled among the variables listed under the headings of the different community factors.

Of course, we see the parent's self-conception as a function of adult experience and adult perceptions in relation to his community. In particular, (a) the perception of the capacity of the immediate social aggregate (neighbors and local organizations) to deal with events and forces impinging on individual lives; (b) the perception of the

Figure J. 1

HYPOTHESIZED GENERAL CAUSAL RELATIONSHIPS BETWEEN CLUSTERS OF COMMUNITY VARIABLES AND CLUSTERS OF INTERVENING AND DEPENDENT VARIABLES



* Represents expected interaction effects

Dotted arrow lines represent the increasingly direct relationship between the maturing child and his extra-familial community.

mutuality of concern felt among members of this immediate aggregate, as reflected, perhaps, in feelings of identification with an area or its socially similar residents; and (c) the actual experience in, and awareness of, organized groups which have taken more or less effective action in dealing with problems affecting the welfare of the aggregate.

Community factors anterior to parent's and child's self-conceptions can be grouped with one exception under the heading of objective features of the community. The exception is a factor which constitutes the behavioral response to the physical and social environment surrounding a residence--the "routine community area." We expect this factor to mediate much of the influence of the physical characteristics of a community.

II. Methods of data collection

A. Types

1. Questions to parents and children
2. Existing data: U.S. Census, city planning and governmental agencies
3. Observation of residential areas
4. Questions to service workers, community leaders

B. Frequency of collection: every year, or with some factors, perhaps, every other year

III. Topics and specific variables

A. Physical facilities and characteristics of the community

1. Specific variables to be measured (from observation and existing data)

a. Layout of a respondent's immediate neighborhood
(1) Short vs. long blocks--Jacobs, 1961, presumes that short blocks provoke interaction
(2) Wide or narrow sidewalks
(3) Observed usage of blocks--even usage at all times or uneven usage
(4) Density of dwelling units
(5) Density of inhabitants/dwelling units
(6) Commercial/industrial usage of residential area
(7) Condition of housing in neighborhood: old/new/remodeled; rental vs. home ownership
(8) Parks/open space
(9) Condition of yard, streets/vacant lots: litter, broken glass, garbage

b. Physical facilities in community area (existing data and observation)
(1) Educational
(a) Ease of transportation to schools

(b) Community services for which schools are used

(2) Recreational (parents and children)
  (a) Proximity to ball parks, movies, bars, pool rooms, gyms
  (b) Existence of parks, playgrounds, or street play areas frequently used

(3) Religious
  (a) Number of churches; number of churches/population size; distribution of churches by size--a lot of small churches, a few big ones, or a mixture
  (b) Number of store front churches; utilization and vitality

(4) Social/fraternal buildings

(5) Political/welfare organization facilities

(6) Public safety
  (a) Police
  (b) Fire

(7) Cultural facilities
  (a) Library
  (b) Concert hall
  (c) Other

(8) Mass media/newspaper/radio/TV

2. Justification

The development and use of physical facilities in community areas is an obvious foundation for the extra-familial growth and education of parents and children alike. It should make quite a difference to such growth and education whether or not such facilities are available, are known about by an area's inhabitants, and are used regularly.

Less immediately evident, but more interesting, is the relationship hypothesized by some (Festinger, Schachter, & Back, 1950) between the physical layout of residential areas and the frequency and warmth of personal interaction among the inhabitants. It is clear that the spacing and positioning of apartment rooms, indeed the whole interior and exterior spatial arrangement of buildings, directly affects the probabilities of interactions of the inhabitants. On a larger scale, the climate of interaction in neighborhoods, according to the theoretical speculation of planners like Jacobs (1961), is a function of such things as the size of blocks, even usage of blocks at different times in the day, and the density of dwelling units. Other studies of various ethnic groups document the commonsensical relationship between the condition of residential construction and the likelihood of residents spending time outside as opposed to inside their homes. This likelihood, in turn, affects the propensity of parents

and play-age children to interact with their respective peers instead of each other.

Some illustrative hypotheses may illumine the intervening links between the physical layout of a residential area and the parents' and children's sense of security and control over environment. Following Jacob's ideas, we would hypothesize that the more even the usage of blocks, the greater the density of dwelling units, the less the density of inhabitants per dwelling, the greater the preponderance of nearby short vs. long blocks, and the greater the social-economic heterogeneity of the residents (to trespass in another topic covered later)--the greater the amount of supportive quality of neighborhood interaction, and the greater the identification of parents with such areas. Given a neighborhood with a mutuality of concern and common identification, one could investigate the degree to which neighbors take on the roles and responsibilities of surrogate family members. Can individual parents feel free to intervene in play situations involving neighborhood children; can they count on the concern of neighbors when their own kids are injured, lost, or when they themselves are unavoidably absent from home when expected by the children? (Measures implicit in the above questions and hypotheses are partially listed under the subsequent factor to be discussed, the "routine community area.")

3. Specific uses of this kind of knowledge with respect to individual parents

   a. The classification of families into groups, depending on whether their neighborhood environment seems to provoke social interaction or isolation, group formation, and, even, organized political action.

   b. Classification of small physical areas, or perhaps of the routine community areas, according to the amount of interaction provoked by the relevant physical characteristics and by the facilities available for use in the area, and according to the amount of interaction as either provoked or constrained by commercial and industrial usage of space in the residential area.

B. The "routine community area" (from interviews with parents)

   1. Specific definition of this area entails knowledge of the location, hence walking distance from a residence to each of the following (with something like an individual parent's average distance, or, say, the 70th percentile of these distances, being used to define the size of the routine area):

a. Principal grocery
b. Work place of each spouse
c. School of children
d. Principal play area of children
e. Laundromat or laundry, if used
f. Department or clothing store
g. Church, if any (one attended most often)
h. Relatives' and friends' homes, if frequently visited
i. Adult entertainment frequented (movies, ball parks, bars, pool rooms, gambling places, etc.)
j. Frequented organizational meeting places
k. Welfare agencies, legal aid, unemployment
l. Health services
m. Cultural facilities and other places regularly visited

2. Assuming the measurement of this routine community area, we should also be interested in the IDENTIFICATION with this area, to wit (from parent interview):

a. Recency of residence in present habitation, in present city, in region
b. Educational experience in area of present habitation
c. Existence of network of relatives who assume potentially supportive roles
d. Amount and domain of intraurban movement
e. Expectations about how long they will reside in this area
f. Attitude toward neighborhood; e.g., would they recommend that a friend move here? Is it getting better or worse?
g. Do they feel they can intervene in neighborhood situations involving other parent's kids? Have they so intervened?
h. Do they feel they can turn to the neighborhood for help?

3. Justification

In some ways, the measurement of this routine area is merely a better measurement of the psychological meaning of the physical characteristics of a community area and the area's social characteristics. Studies and novels both speak of the psychological confinement felt by ghetto residents who rarely move beyond the boundaries of their own ethnic/racial dwelling areas, and of the effects of such confinement on the spirits and self-conceptions of such residents (Brown, 1965; Wakin & Lettau, 1965). By measuring the boundaries wherein routine daily experiences take place in the lives of the parents, we hope to estimate the extent of such confinement and to predict its corresponding impact on the

intervening variables mentioned before. Moreover, it is basic that we know the size and boundaries of the behavioral area to which the parent has implicit or explicit reference in answering many other questions about himself. Finally, by measuring both the location of the routine area of experience and the identification with this area, we hope to open up the study of the type of questions mentioned in the discussion of broader theoretical issues (part E) under the General Considerations which opened this chapter.

4. Specific uses of this knowledge

   a. The size of the routine area for each parent; i.e., how large is the physical world in which the parents live, and how constricted is their actual physical movement.

   b. The average size of such areas for parents in various parts of a wider area--perhaps blocks or clusters of blocks. Perhaps city areas are differentiated by the size of the physical worlds of the inhabitants, such that residents in one area have larger "routine areas" than in another.

   c. The classification of parents into graduated levels of localism, as a joint function of the size of their routine area and the locus of their identification, comfort, and security within local and wider metropolitan areas.

C. Social characteristics of an area population and the recent history of these characteristics

   1. Specific variables

      a. Demographic characteristics (from census data, city planning or governmental agencies) of areas: now, five years ago, and, perhaps, ten years ago

         (1) Age/sex/occupational composition of areas
         (2) Birth rate/legitimate/illegitimate
         (3) Disease rate TB/VD/upper respiratory/mental illness/etc.
         (4) Death rate/infant mortality/childhood diseases/heart diseases/cancer/suicide
         (5) Educational level of adults in areas
         (6) Level of full employment in area
         (7) Crime rate and preponderance of crimes against person vs. property
         (8) Drug addiction
         (9) Alcoholism
         (10) Racial/ethnic/religious mixture in composition of population

(11) Proportion of residents on welfare, duration of such dependency, proportion of area's income derived from welfare
(12) Proportion of those eligible who are registered voters
(13) Percent of in/out migration
(14) Number of fires in area compared to other parts of city

b. Degree and history of social organization in area: how large, active, effective (from interviews, observations, and existing data)
(1) Political groups (concerns, degree of control over schools, voting, job opportunities, forms of entry into area, by other ethnic groups, etc.)
(2) Religious groups (with social concerns and activity; how pervasive in the community; how much influence do ministers have)
(3) Trade/work/professional associations
(4) Fraternal/social organizations
(5) Criminal operations: numbers, dope, prostitution, protection
(6) Informal street organizations
(a) Number of people engaged in voluntary "surveillance" of street
(b) Number of incidents of community control of street and backup by neighbors
(c) Number of incidents of children being taught social norms by adults other than parents
(d) Number of "public characters" on street. Times present
(e) Number of incidents when other control agents (i.e., police) are called to street
(7) Number, type, and resolution of grievances dealt with by the community leadership and other groups during the recent past (10 or so years)
(8) Number, type, and resolution of open conflicts between community leadership and other groups during the recent past
(9) Efforts made by the community leadership to encourage citizenship participation in
(a) Civic government and political clubs
(b) Activities relating to school
(c) Other projects
(10) The degree to which new groups or individuals representing heretofore unrepresented groups have been admitted to the ranks of community decision makers in the recent past

2. Justification

a. The demographic and social organizational characteristics just noted delimit the extent to which any community resident can find his residential area relatively non-problematic, safe, supportive, and controllable. Presumably, life within the family and learning and growing within the school reflect a supportive environment or its absence. The extent to which parent and child alike can maintain a sense of worthiness, comfort, and acceptance within a community environment is additionally affected by the social homogeneity of characteristics, relative to their own social characteristics. That is, do the parent's characteristics make him typical of those residents around him or not, and what effect does this congruence or its absence have on both parents' and children's feelings of acceptance and control? The usual assumption is that parents with characteristics homogeneous to those of the immediate neighborhood will more frequently interact with, identify with, form groups in and even lead fellow neighbors. These experiences, in turn, affect the self-conceptions of parent and child.

b. These characteristics can change over time. Residency in areas of rapid social change--be it change in demographic or organizational characteristics, or less tangible changes in perceptions of such real or threatened change as sources of hope or despair--should be distinguished from residency in relatively stable environments.

3. Specific uses of this knowledge: to differentiate the larger population areas in which the parents and children studied reside, so as to explain differences in parents' and children's self-conceptions and children's growth and education <u>between</u> these larger population areas.

D. Social characteristics of children's parents, individually and aggregated

1. Specific variables (from parents' interviews and welfare records)

<u>Family characteristics</u>

a. Number of people in each home/relationship to parents
b. Age/sex composition of families
c. Educational levels of parents, especially relative education of husband/wife
d. Employment history of husband/wife, regular employment, frequent periods of unemployment, number of years of employment experience

e. Permanence of marital relations and residency of husband
f. Experience and attempts at home ownership
g. Welfare experience, proportion of income presently derived from, expected continued dependency on
h. Occupation and its industry of head of household
i. Age and region of birth
j. Ethnic identification, which generation immigrated?
k. Denomination of church affiliated with
l. Experience of discrimination in housing

Attitudes and perceptions

m. Attitude toward school/administration/teachers
n. Attitude toward and utilization of police/government/fire department
o. Attitude toward local community leaders and organizations
p. Attitude toward recreational and cultural facilities of the neighborhood
q. Perception of community's collective determination
r. Attitude toward local political process
s. Attitude toward realization of own educational aspirations
t. Knowledge of community facilities
u. Knowledge of local change

Media participation

v. Newspaper/magazines/books read
w. Radio/TV programs enjoyed

2. Justification

a. The measures a-l reflect the intersection of extra-familial social systems with the family lives of parent and child. For it is in the wider community that the family encounters superior or inferior housing conditions, educational facilities, and employment opportunities, as these things affect, in turn, housing tenancy (own or rent property), marital permanence and size and composition of households. How intact and secure does this impinging community leave the family; how economically and maritally secure are its members? The impact of such factors on the parents' and children's sense of control over environment is clearly arguable.

In the background there also lies the broader theoretical issue of the congruence between the individual family and the surrounding collectivity, with respect to the family characteristics just noted. This is an issue also relevant with respect to media participation (measures v & w). Thus we can ask, how consistent is the parent's participation in the media mentioned with the average participation of those around him. How typical, indeed, is any given parent with respect to the family characteristics just noted, and what effect does such consistency have on parental self-conceptions?

b. The attitudinal measures permit that comparison of subjective feelings and objective conditions whose fruitfulness is argued earlier in the consideration of broader theoretical issues (part A) under General Considerations. Moreover, if behind these attitudes (whether or not they are consistent with objective conditions), there lies the impression of a supportive environment (friendly and interested teachers, community leaders, representatives of local government), then the parent should have a greater sense of the security of such an adequate environment. If the community facilities are present, known about, and known to be supportive in their benefits for all users, again this sense of security and control will belong to the parent, who should then give analogous impressions of control and security in the environment to the child.

E. Perceptions of community areas and residents held by service workers (from interviews with such workers)

1. Specific variables (from interviews with a stratified sample of the following from each area) social workers, police, insurance men, outside businessmen, outside professionals, health workers, and sanitation men

a. Attitudes towards the degree of public safety in an area
b. Receptiveness/experience in working with actual or potential organized political groups in community
c. Sympathy for/resentment against demands of organized groups, Black Power, etc.
d. Extent of professionalized (doing my job) vs. personalized approach to job, working with community members

2. Justification

The environment confronting the individual family is not only constituted by the physical characteristics of the area, or the social characteristics of its population, but by the representatives of municipal and federal bureaucracies who deal with the members of a community, as a group and as individuals. Attitudes of social workers, police, insurance men peddling in the neighborhood, health workers in nearby hospitals, are increasingly studied in their relation to the utilization and effectiveness of such services by and for community members. Our interest is confined to the important aspect of community life that is constituted by the perceptions and attitudes of these service workers and the bureaucracies

they represent, as these perceptions and attitudes surely affect the perceptions community members have of themselves and their environment.

Again, the broader issue arises of the presence and effects of congruence between the attitudes of parents and the "objective" climate of opinion about people in different residential areas held by diverse service workers. One can ask, further, under what kinds of conditions (encompassing previously discussed factors) does congruence between parents' and service workers' attitudes obtain, and what is the effect of such congruence and other characteristics of service worker attitudes on the security and possibilities of control a parent finds in the community environment.

3. Specific uses of this knowledge

Again, delimitable areas of the communities in which we find respondents can be differentiated with respect to the perceptions of service workers. Such perceptions by outside officials can then be related to such things as: the degree of organization within the community; individual parents' perceptions of their treatment as clients with needs to be met by these services, and as mediators of these services to their children; and to the welfare of the children themselves.

K. THE IMPACT OF THE TESTER

Samuel Ball

> The sources of error begin...before the recollection sets in. The observation itself may be defective and illusory; wrong associations may make it imperfect; judgements may misinterpret the experience; and suggestive influences may falsify the data of the senses. (Münsterberg, 1908)

In the late eighteenth century astronomers noted that their observations of the timing of movements of stellar objects were different from observer to observer. It took some moments of interpersonal conflict before the fact of reaction time and its confounding with human perception was realized (Boring, 1957). Similar reports of observer influence on observations became available from other sciences too, as they developed sophistication in measurement. Observer effects were noted in medical research when a group of medical practitioners was asked to relate degree of obesity to a particular therapeutic drug being used on patients. At first the results seemed puzzling until it was realized that the actual obesity rating could readily be predicted by referring to the rater's own height-weight ratio (Rosenthal, 1968). Obesity, it seems, is in the size of the beholder.

In education research, the "halo" effect provides an excellent, early illustration of the distortions that can occur in measures when they are being obtained primarily from an observer. In more recent times educational research has provided an interesting variant of the halo effect. This variant is the "self-fulfilling prophecy" phenomenon described in some detail by Rosenthal and Jacobson (1968). Despite some possible methodological criticisms which might be made of their research, it is reasonably clear that a child's test performance can be seen as a partial function of those with whom he interacts in the classroom. In short, a teacher gets from a child what he expects to get. If this is true, with respect to teachers and students over a lengthy period of time as in most of the Rosenthal studies, it also seems to be true over short periods of time with testers and subjects in an individual testing situation. For example, Asch (1946) in a laboratory situation demonstrated that once a certain crucial label was attributed to someone being observed, his entire impression was transformed leading to observers prejudging him on a wide range of variables. This study was replicated and extended by Kelley (1950) who not only verified Asch's work but also found that the different expectations generated in the early impressions from a dyadic relationship influenced almost all subsequent interactions.

An excellent summary of research in this area of the impact of the tester, observer, or experimenter on the subject being observed is provided by Kintz, Delprato, Mettee, Persons, and Schappe

(1965). As well as providing an historical account of research into the phenomenon, they present conclusions on such main effects as E's personality, experience, sex, expectancy, and modeling behavior.

Over the past five years the impact of the tester has been studied even more vigorously with increasing emphasis on interactional effects. The following four studies can merely be regarded as typical of this literature. Cox (1968) examined some relationships between test anxiety, presence or absence of certain male persons, and boys' performance on a repetitive motor task. He found, inter alia, that absence of persons other than E and S from the experimental room resulted in response increments in high test-anxious boys and response decrements in low test-anxious boys. He also found that the mother's presence increased the response rate in low test-anxious boys. Egeland (1967) had a low- and a high-anxious tester administer the WISC to fifth grade children. Ss tested by the high-anxious tester obtained significantly higher measures than did the comparable group tested by the low-anxious tester. Quereshi (1968) investigated the effects of the tester's sex on WISC subtest scores varying Ss' sex and age. He found that there was a significant main effect due to the sex of the tester and a significant interaction between tester's sex and S's sex. This finding is in accord with studies cited by Rosenthal (1968) which showed that testers spend more time, smile more often, and sound friendliest when testing children of the opposite sex (though they also sit a little farther apart from the child being tested). Finally, Katz, Henchy, and Allen (1968) found that northern urban Negro boys of grade school age performed better on a verbal learning task with Negro rather than white testers.

This eclectic collection of research has been presented in order to indicate the strength and ramifications of the tester's and observer's effect on a child's performance and on how that performance is perceived. Perhaps it is primarily a function of expectations as was classically demonstrated in the case of Clever Hans, the horse who could answer quite complicated questions provided the questioner were present and knew the answer (Rosenthal, 1965). In fact, however, for purposes of this longitudinal study of disadvantaged children, it is not essential that we be able to explain beforehand what the mechanism is that causes the tester and observer effects. We do need to be intelligently informed of their existence, to take steps to minimize their importance, and to include measures of tester and observer that allow us to describe and control the effects.

Of course, in the carrying out of the study certain obvious but important principles of research will be adhered to. First, observers and testers will be carefully chosen from within the communities where the study is being conducted. Next, a thorough training of testers and observers will be undertaken. After some four weeks of training a selection will take place so that only two-thirds of those initially selected for training will in fact be used. No tester or observer will become involved in this study

unless she has shown competence in testing and observing children. This competence must be demonstrated in a situation as near as possible to the one in which she will be working in the study.

As well as care in selection and training, a third control will be in the actual operation of the data collection. Teams of researchers from ETS will be visiting testing sites in order to conduct follow-up, in-service training of the testers and observers. Fourth, as the data are being collected, analyses will be conducted, whenever possible, to ensure that standards of interjudgemental reliability are maintained. Analyses will also be conducted to determine the comparability of the testers' and observers' scores (means and variances) on their subjects.

These strategies are not new to well-organized, large-scale, empirical research studies. The more unusual additional strategy to be implemented here is that testers and observers will themselves be measured on a variety of instruments. We shall be able to present in the reports of our study, demographic and biographical data on testers and observers, as well as attitudinal and ability measures obtained on them. The actual instruments to be administered are:

Background Information and Description Survey
(relevant items from Teacher Questionnaire)
Intelligence Estimate
Perception of Disadvantaged Students
Polarity Scale

These measuring instruments will provide such information about testers and observers as verbal intelligence, attitudes toward the disadvantaged, and academic background--factors likely to influence significantly the performance of the subjects in our sample.

Another useful feature of this data collection will be that it will enable us to carry out the recommendation made by McGuigan (1963). He suggested that experimenters use factorial designs which include measures on the observer or tester as a major independent variable.

Thus we will employ proper techniques of data collection to minimize the impact of the tester and observer. However, we know that, even so, the impact will still be manifest in our data. Therefore we will obtain sufficient measures on our testers and observers so that they can be not only adequately described in our reports but also included as a variable in the statistical treatment.

L. SUMMARY OF MEASUREMENT STRATEGIES

Scarvia Anderson and Samuel Ball

Each of the preceding major chapters has moved in the general direction: from overall conceptualization of a large domain, to general measurement strategies, to specific measures (amplified in Appendix c). It remains now to review briefly why we decided to deal in detail with so many domains and to consider how the measurement strategies are related across them.

It is important to recall that this longitudinal study is viewed simultaneously and interdependently as basic research on child development and evaluative research on Head Start (and related early education programs). In other words, we are committed to measuring not only children but also educational programs, to explanation as well as description, and to both contributions to psychological theory and recommendations for social action. Thus, we must include measures of the teacher, classroom, and other characteristics of the school or Head Start center along with assessments of children's personal, social, perceptual, and cognitive development. The commitment to explanation insists upon multiple sources of data that might in purely descriptive studies be "extra" (e.g., from the family, the community, testers, physicians); limited information notoriously generates explanations with many plausible rivals. Finally, the concern with theory and action requires broadening the base of data collected within each domain; this will enable both the structural analyses deemed important for theoretical contributions and the detailed specification of child-environment interactions necessary for meaningful action recommendations.

In order to reduce the multiple measurement strategies of the study to a scannable set, let us think in terms of the familiar what, who, when, where, and how. The following general categories will be used to comprehend the measurement plans in all domains:*

What - Cognitive (Reasoning, Analytic Styles, Attention-Learning-Memory, General Knowledge, Verbal Skills, Quantitative Skills, Development with Respect to Performance on Piagetian Tasks, Creativity+), Perceptual, Personal-Social (General Personality, Attitudes and Interests, Controlling Mechanisms+, Social Motives), Physiological, Physical

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*The categories here bear a close relationship to the scheme spelled out in more detail for the personal-social measures, Appendix b.

+Arbitrary classifications; Creativity and Controlling Mechanisms may have cognitive, personal-social, and perceptual components.

Who - (or other object of measurement): Child, Mother, Other Adults in Home, Siblings, the Home Itself, Teacher, Other Adults in Classroom, Classmates, the Classroom Itself, Other School Personnel, the School, the Community, Tester, Child x Mother, Child x Teacher (or other adult in classroom), Child x Child

When - has several aspects in this study; e.g., the actual calendar year, which could make a difference in terms of possibly influential social changes; chronological age of child; educational level of child; number of years exposed to the study or educational treatment (applies to parents, other adults, as well as children): spring 1969, longitudinal sample about 3 1/2 years old, 1969-70 longitudinal sample 4-5 years old, 1970-71 longitudinal sample 5-6 years old, 1971-72 longitudinal sample 6-7 years old (grade 1), 1972-73 longitudinal sample 7-8 years old (grade 2), 1973-74 longitudinal sample 8-9 years old

Where - (assessments take place): Testing Center or Room, Home, Classroom, Other Area of School, Medical Office, Other Community Site

How - (assessment method): Test-Questionnaire-Inventory (Individual), Test-Questionnaire-Inventory (Group), Interview, Observation, Records Search, Medical Examination (including Medical Laboratory Analysis)

(source of information): Mother, Other Community Members, Teacher, Other School Personnel, Classmates, Tester, Observer, Medical Personnel, Child, Records

Table L.1 provides an overview of the proposed study measures in terms of what, who, and when (calendar year) for the longitudinal sample. The numbers in the table refer to measures listed in Appendix C. Some further selection with respect to child measures for kindergarten and grades 1-3 is expected prior to their first administration (to cross-sectional groups) in the spring of 1970.

Table L.2 summarizes the how's (assessment method) and where's of measure administration, in relationship to what is being measured. It will be noted that the largest numbers of measures fall in the Test-Questionnaire-Inventory category; however, numbers (by title) alone are somewhat misleading, since many of the observations cover a relatively long period of time and include many, many "items."

The other methodological category that may be of interest is source of information (e.g., the person who answers the question or filters the information). Table L.3 lists the relationships between the object of measurement and the sources of information about that object.

Table L.4 summarizes the kinds of information that will be obtained for the comparison groups of the study. The total study design is discussed in Chapter M.

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At the beginning of this chapter, we recalled that this study has two aspects, evaluation and basic research. In fact, a thoroughly professional approach to the first makes the second inevitable. Because of the discrepancy between the goals and functions of any complex educational program such as Head Start, an evaluation provided merely in terms of its apparent or stated goals would be misleading and incomplete. If we wish to assess and evaluate the full impact, in all of its ramifications, of the Head Start intervention, a wide range of background, treatment, and child variables must be studied. In so doing, we are collecting and analyzing data long needed in our search for basic understandings of developmental processes in children.

Everywhere underlying the design of this study are a conception of the complexity of the human organism and an interactional model of human development. Although a number of theoretical domains have been discussed under particular chapter headings, we no more think that the child's physical and cognitive development are independent than we think that the home and preschool exert their effects in easily separable spheres--or that it isn't possible for the pupil to influence the educational treatment. The fact that the Head Start intervention, unlike many traditional educational programs, is based upon a similar point of view is exceedingly congenial, since Head Start is a major object of interest in the study. It is also convenient that this research age can provide such compatible data storage capacities and multivariate analytic techniques.

TABLE L.1

Who (Object of Measurement) — What (Longitudinal Sample)

Who (Object of Measurement)	Cognitive (Including Creativity)					
	69	69-70	70-71	71-72	72-73	73-74
Child	24 34,36,38 39,40 57,68,71 73,77,90 95,99 108	2,6,(21),23,24 34,36,37,38,41,42 39,40,53 57,64,68,71,72 73,77,81,82,90,91 95,99 108	2,6,12,21,23,24 33 34,35,36,37,41,42 39,40,45,46,52,53 57,60,(64),71,(72),76 73,77,81,82,90,91 95,99 108	6,12,13,17,21,23 25,26,27,28,29,30 34,35,37,41,42,43 40,46,52,53 57,71,76 73,81,82,90,91 95,99 108	6,12,13,17,21,23 25,26,28,29,30 34,(35),37,(42),43 40,(46),52 57,71,76 73,81,82,91,92,93 95,96,97,98,99 100,101,108	6,12,13,17,21 25,26,28,29,30 34,37,43 40,(46),52 57,71,76 73,81,82,91,92,93 95,96,97,98,99 100,101,108
Mother	67	67,113	67	67	67	67
Other Adults in Home						
Siblings						
Home						
Teacher		109	109	109	109	109
Other Adults in Class						
Classmates	Cognitive, Perceptual, Personal-Social Battery Identical to Longitudinal Sample					
Classroom		80,84	80,84	80,84	80,84	80,84
Other School Personnel						
School (Center)						
Community						
Tester	109	109	109	109	109	109
Child x Mother	48,49,50	48,49,50	48,49,50	48,49,50	48,49,50	48,49,50
Child x Teacher						
Child x Child						

TABLE L.1 (Continued)

What (Longitudinal Sample)

Perceptual						Personal-Social (Including Controlling Mechanisms)					
69	69-70	70-71	71-72	72-73	73-74	69	69-70	70-71	71-72	72-73	73-74
	1	1,4	1,4	1,4	1,4	8	8,15,16	8,15,16	8,15,16	8,15,16	8,15,16
11,31	11,31	31	31	31	31	44,47	44,47,51	44,47,51	44,47,51	44,47,51	44,47,51
55	55,56	55,56	55,56	55,56	55,56	58,61,62	58,61,62	58,61,62	58,61,62	58,61,62	58,61,62
86	86,112	86,112	112	112	112	63,66	63,66	63,65,66	63,65,66	63,65,66	63,65,66
		94	94	94	94	83,88	74,83,88	74,83,88	74,83,88	83,88	83,88
						106	89,106,80	89,106,80	89,106,80	89,106,80	89,106,80
							56	56	56	56	56
						18,54,67	18,54,59,67	18,54,67	18,54,59,67	18,54,67	18,54,59,67
						67	67	67	67	67	67
						67	67	67	67	67	67
							14,22,32,75	14,22,32,75	14,22,32,75	14,22,32,75	14,22,32,75
							80,84,102,103	80,84,102,103	80,84,102,103	80,84,102,103	80,84,102,103
							80,84	80,84	80,84	80,84	80,84
	84	84	84	84			74,80,84	74,80,84	74,80,84	80,84	80,84
								69,78,79,105	69,78,79,105	69,78,79,105	69,78,79,105
							9,67	85(9 Lee Co.) 67	85,67	85,67	85,67
						18,20,87	18,20,87	18,20,87	18,20,87	18,20,87	18,20,87
						75	75	75	75	75	75
						48,49,50	48,49,50	48,49,50	48,49,50	48,49,50	48,49,50
							80	80	80	80	80
							80	80	80	80	80

Continued

TABLE L.1 (Continued)

What (Longitudinal Sample)

Who (Object of Measurement)	Physiological						Physical					
	69	69-70	70-71	71-72	72-73	73-74	69	69-70	70-71	71-72	72-73	73-74
Child	3,5 7,10 70 104 107 110 111	5 7,10 70 104 107 110 111	5 7,10 70 104 107 110 111	5 7,10 70 104 107 110 111	5 7,10 70 104 107 110 111	5 7,10 70 104 107 110 111						
Mother												
Other Adults in Home												
Siblings												
Home							67	67	67	67	67	67
Teacher												
Other Adults in Class												
Classmates												
Classroom												
Other School Personnel								9	9,85	85	85	85
School (Center)							18,19	18,19	18,19	18,19	18,19	18,19
Community												
Tester												
Child x Mother												
Child x Teacher												
Child x Child												

TABLE L.2

How (Assessment Method)

What	Where	Test-Quest.-Inv. (Individual)	Test-Quest.-Inv. (Group)	Inter-view	Observation	Records Search
Cognitive	Test Center or Room	2,6,13,21,23,24, 33,34,35,36,37, 38,39,40,41,42, 43,45,46,48,49, 50,52,53,57,64, 68,71,72,73,76, 77,81,82,90,91, 92,95,99,108,113			48,49,50	
	Home			67		
	Classroom		12,17,25,26,27,28, 29,30,35,60,93,95, 96,97,98,100,101		84	
	Other School Area[1]		109			
Perceptual	Test Center	1,4,11,31,55,86, 94,112				
	Classroom		112		84	
Personal-Social	Test Center	8,44,48,49,50, 51,54,58,59,61, 62,63,66,74,83, 88,89	18	56,65	47,48,49,50, 62,106	
	Home			18,67		
	Classroom				15,80,84	
	Other School Area[1]	9,69,79,102,103	14,22,32,75,78,105	16		
	Community			87		20
Physio-logical	Test Center	110				
	Other School Area[1]			104		
	Medical Office	5,7,70,107,111[2]		10		
	Community					3
Physical Environment	Home			18,67		
	Other School Area[1]	9,85				85
	Community				19	
	Test Center		18			

[1]Includes use of classroom when school is not in session.

[2]These five measures are part of the medical examination.

Table L.3

SOURCES OF INFORMATION (LONGITUDINAL SAMPLE)

Object of Measurement	Sources
Child	Mother, Teacher, Classmates, Tester, Observer, Medical Personnel, Self
Mother	Observer, Self
Other Adults in Home	Mother
Siblings	Mother
Home	Mother, Observer
Teacher	Mother, Observer, Self
Other Adults in Class	Observer, Self
Classmates	Teacher, Other Classmates, Observer, Records, Self
Classroom	Teacher, Observer
Other School Personnel	Self
School	Mother, School Personnel
Community	Mother, Other Community Members, Records
Tester	Observer, Self
Child x Mother	Observer
Child x Teacher	Observer
Child x Child	Observer

Table L.4

ASSESSMENTS FOR ALL GROUPS

	Sample	Cognitive, Pers.-Soc.		Physical[1]		Family		Teacher		Classroom		Community	School, Center
		Comp	Abbre[2]	Comp	Abbre	Comp	Abbre	Comp	Abbre[3]	Comp	Abbre[4]		
Longi-tudinal	LD	✓[5]		✓		✓		✓		✓		✓	✓
	LDE (move out)		✓		✓	✓			✓				
	LDI (move in)	✓			✓		✓	✓		✓		✓	✓
Cross-Sectional	CK (69-70)		✓		✓		✓	✓		✓		✓	✓
	C1 (69-70)		✓		✓		✓	✓		✓		✓	✓
	C2 (69-70)		✓		✓		✓	✓		✓		✓	✓
	C3 (69-70)	✓			✓		✓	✓		✓		✓	✓
	CHS (73-74)	✓			✓		✓	✓		✓		✓	✓
	CK (73-74)		✓		✓		✓	✓		✓		✓	✓
	C1 (73-74)		✓		✓		✓	✓		✓		✓	✓
	C2 (73-74)		✓		✓		✓	✓		✓		✓	✓
	Special Comparison		✓		✓		✓				✓		

[1]Abbreviated physical, family data obtained from school or center records.

[2]A subset of total battery.

[3]A subset of total teacher battery.

[4]PROSE only, and for a smaller number of observations.

[5]Mother-child interaction, LD only.

M. PROCEDURES

The General Measurement Plan and the Selection of Communities

Albert E. Beaton

The general strategy of the study is to follow the developments of a group of children from a time period just preceding Head Start attendance age through their third grade year. At each point in time the study will focus on the child's individual behavior and the effects of other domains that may influence individual performance. The domains studied include the cognitive/perceptual, personal/social, physical, family, classroom, teacher, school, and community. In addition to the longitudinal sample, there will be a series of cross-sectional samples collected for comparative purposes.

The subjects, then, form nine groups which are defined as follows:

LD is the longitudinal sample, including all children who live in the areas covered by the study throughout the life of the study. These students will be studied whether or not they attend Head Start and whether or not they attend kindergarten. Of course, some measures--namely, those obtained in the classroom setting--will not be available for those who do not attend either Head Start or kindergarten.

LDI is a longitudinal sample of children who migrate into the area during the life of the study. Of course, this sample contains no students at the initial testing, but it is expected to grow in number throughout the life of the study.

LDE is a longitudinal sample of children who are available for initial testing but who migrate out of the study. We will attempt to follow these children wherever they migrate. At the initial testing, these students will be indistinguishable from those in Group LD, and the full membership of this group will not be known until after the final year.

H_S is a cross-sectional sample of children approximately 4.5 years old observed while in a Head Start program.

C_K is a cross-sectional sample of children approximately 5.5 years old observed while in kindergarten.

C_1 is a cross-sectional sample of children approximately 6.5 years old observed while in the first grade.

C_2 is a cross-sectional sample of children approximately 7.5 years old observed while in the second grade.

C_3 is a cross-sectional sample of children approximately 8.5 years old observed while in the third grade.

S_C is a cross-sectional sample of children approximately 4.5 years old observed while in a Head Start program and re-tested 4 years later in Grade 3.

These nine groups are mutually exclusive, although the exact composition of the "longitudinal" samples cannot be determined until late in the study.

The schedule for assessment for the study groups by domain is given in Table L.4; the schedule by year of the study is shown in Table M.1. Note that for the LDE sample, we will have a full set of measurements for persons in that sample until they leave the study area and an abbreviated set thereafter.

The sample has been selected from areas where there is an opportunity for children to attend Head Start, thus in areas with a substantial proportion of the population below the poverty line. Consideration of the costs and feasibility of the study determined that four communities could participate in the study. The communities were selected according to the following criteria:

1. Program
   To be considered, a school system must serve children who have had an opportunity to attend a year-long Head Start program. We preferred school systems with Follow-Through and tried for some with and some without kindergartens.

2. National Representation
   We searched for representation from different sections of the country and for some urban and rural variance.

3. Sufficient Number of Students
   A community was not considered eligible if it did not have a sufficient number of children in school and in the Head Start program. We attempted to obtain a reasonable racial mix. We also took into account factors that might result in a significant change in the area during the study.

4. Cooperation
   The study is, of course, impossible without the cooperation of the community including its school officials and community leaders. We also disqualified areas in which we felt unsure of continued support over the life of the study.

As an additional factor, we chose to select one community relatively close to Princeton in order to provide for close interaction between the ETS staff and the functioning of the study.

The selection procedure began with an examination of the 1968 list of thirty school systems having Follow-Through programs. The list was examined carefully in terms of the other criteria, and a subset was selected for further investigation.[1] A member of the ETS professional staff visited the several sites for additional information, including evidence of willingness to engage in a relatively long-term study. Two cities--Portland, Oregon, and Racine, Wisconsin--were selected, though Racine was later dropped to achieve regional balance.

Since the list of Follow-Through schools contained no southern rural system which met our criteria, other lists of communities were reviewed and Lee County, Alabama, was selected. Lee County represents a truly southern rural community, but with a nearby university and an available source for recruiting personnel.

We then decided to select a large and a medium size city from the eastern and central regions of the country. Using random numbers, we prepared a list of large cities to guide our selection. The three pairs of cities chosen as adequate to meet our criteria: Pittsburgh and Racine, Baltimore and Racine, and Trenton and St. Louis. Since the Trenton and St. Louis combination met our condition that one site be near Princeton, this pair was selected.

Within these communities, school districts have been selected for participation. These school districts are expected to be the schools in which the longitudinal sample will be enrolled when in the third grade. These schools are, of course, located near Head Start centers.

All of the children in the school district of approximately 3 1/2 years will be included in the initial longitudinal sample, although some may be dropped because of testing problems, such as those children from families speaking a foreign language or those with severe physical handicaps (e.g., cerebral palsy). The population of children will be identified by a complete canvass of the neighborhood and listing of the children.

The cross-sectional samples will be selected from the same communities but at different age levels.

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[1] A report of the site selection process is given as Appendix f. The document records work done as of fall 1968 and additional notes. As plans developed, Philadelphia's availability for the duration of the study seemed uncertain. An alternate plan was adopted that would maintain regional and community size representation.

Table M.1

OVERALL STUDY PLAN

Sample	Sp. 69	69-70	70-71	71-72	72-73	73-74	74-75	Comments
LD - Longitudinal Disadvantaged	Pre(2000)	HS(2000)	K(1700)	Gr.1(1445)	Gr.2(1230)	Gr.3(1045)		In 69-70, 70-71, some children will not attend Head Start, Kindergarten
LDE - LD who leave site		( )	(270)	(500)	(695)	(860)		
LDI - LD who move into site		( )	(250)	(555)	(770)	(955)		
C_{HS}	HS(100)					HS(360)		Sp.69 HS sample at one site only. 73-74 HS sample optional but desirable to assess change. HS may bear a different name in 73-74.
C_K Cross-Sectional (same feeding areas, elementary schools)		K(360)				K(360)		73-74 Gr.2 sample, as above
C_1 "		Gr.1(360)				Gr.1(360)		73-74 Gr.1 sample, as above
C_2 "		Gr.2(360)				Gr.2(360)		73-74 K sample, as above
C_3 "		Gr.3(360)						
SC - Special Comparison groups (different but comparable feeding areas, elementary schools)			HS(480)				Gr.3 (250)	74-75 Gr.3 sample a re-testing of 70-71 HS sample as a comparison group to assess impact of intervening testing.
MC - Special Middle		Pre ( )	NS ( )	K ( )	Gr.1 ( )	Gr.2 ( )	Gr.3 ( )	

General Plan for Field Operations

Samuel Barnett and Joseph L. Boyd

One major point emerging from the nationwide efforts to provide better educational experiences for disadvantaged students is the increasing difficulty of research operations in ghetto areas. To accomplish the goals of such an ambitious study as the present one, the field operations aspect is most critical. ETS's announced commitment to community involvement in research operations at the study sites both has the advantage of helping to answer the question "What's in it for me?" and also leaves the door open for a constant searching analysis by the community of what ETS is doing and how we are doing it.

This is a time of increasing recognition that education is a gateway to economic liberation for the disadvantaged black person and the poor white. All parties--parents, school, and community--are concerned about the "outsiders" doing research, the study's relevancy to the issues they perceive as important, and the need for mutually helpful relationships between the researchers and the community.

Thus, researchers have to understand the hesitation of school superintendents trying to decide whether to allow their schools to participate in the research. Although the study offers an opportunity for schools to foster the good human relations they need with communities, it may appear to open up a critical examination of the existing educational program and also to promote the ever present threat of an attempt by communities to take over control of the schools. At the same time, many parents and other community members are concerned with statistical proof of the inadequate job the schools are doing, and they see the efforts of such a study as an ally in achieving their purpose. The black leadership in many disadvantaged communities is looking for total involvement of black people in any program attempting to do studies on their "turf." This leadership feels that it is its duty to examine closely the rationale and honesty of all instruments of measurement. These are some of the conditions for operations in the field; they provide insight into the political maze-running which has characterized efforts to secure initial cooperation in each of the candidate sites.

The general plans for implementation of the field operations of the study are seen as incorporating the following steps which hopefully will overcome some of the problems presented above.

1. Recruiting and training local coordinators. Site selection as determined by the criteria mentioned earlier has narrowed to four cities. In each of these cities there will be a local person hired as a full time ETS employee to coordinate all local activities of the project. This person has been

located by a combination of subtle investigation and consultation with influential members of both the "grass roots" and the "Establishment." Final selection is, of course, being made by ETS personnel. Selection criteria include:

a. past experience in working with community groups of low SES
b. demonstrated administrative ability
c. knowledge of community resources, especially health and welfare agencies
d. ability to communicate clearly, both orally and in writing
e. good health and full mobility
f. a valid driver's license

When we discussed the type of person we were looking for, many school and community people were quick to inform us that it was not possible to locate such an individual. It is interesting to note that we were able to find several well qualified persons in each city visited.

In order to saturate our local "hero" with the proper goals of the study and the types of instruments to be used for measurement, it was decided to bring all four coordinators to Princeton for an orientation program. Points to be covered at the sessions include the following:

a. an overview of ETS in general
b. a complete overview of the proposed study
c. introduction to task force leaders and detailed discussions of the measuring instruments
d. information on contacts and communication channels
e. goals and deadlines of the projects
f. requirements for interviewers, testers, classroom observers, and other project personnel; procedures for hiring and training
g. the role of the local coordinators with regard to the survey staff, the community, the families, school and preschool staff, and other local agencies
h. administrative problems of operating a test center
i. financial responsibilities
j. personnel policies of ETS

During the sessions, coordinators will be encouraged to discuss and recommend changes in instruments or plans for implementing the program. It will be stressed that a continuing dialogue between the coordinators and the Princeton office will help us to be more relevant to their communities. We believe that the fundamental factor which will determine to a great degree the success of this program is the extent to which communities are involved (including awareness of the program and its goals by a maximum number of people).

Some of the responsibilities of our man on the site will be:

a. submitting all pertinent data on study subjects to the Princeton office
b. scheduling classroom observations and in-school testing after joint planning with school systems

c. referring to health and welfare agencies all children identified as having physical or health problems
d. meeting with and discussing the program with PTA groups and other interested people in the community
e. hiring and supervising classroom observers, testers, and other project personnel
f. arranging for and participating in training programs for local personnel
g. arranging for testing of children in local centers
h. coordinating with the survey organization and aiding in their selection and training of local people to carry out census and interview aspects of the project
i. working with the teachers of preschool and school children in the study
j. keeping track of the residences of study children

2. Identification of study subjects; initial home interviews. Once a study site has been selected and a local coordinator has been hired and trained, the next step (which is currently underway in at least one site) is the identification of the target populations. This is being done by a census of feeding areas of specific elementary schools.

Current plans of our survey group call for a door to door canvass by local community people who will be selected and trained jointly by the survey group and ETS. The census taker will make at least three calls to establish whether there is a 3- or 4-year-old child in the household; i.e., a child eligible for grade 1 in 1971. Where this information cannot be obtained from the immediate household, it will be asked of neighbors. Coordination of these census takers will be the responsibility of the survey group.

Once we have determined the target populations from this census, the first solid confrontation of the family will now be made. The interviewers of the target families are second in importance only to the local coordinators. Certain checks and balances have been prepared to ensure that an appropriate picture of the goals of the study is presented to target families. Some of these checks and balances are as follows:

a. Interviewers will go through at least a week of orientation and instruction sessions conducted jointly by the survey group, members of the Princeton staff, and local coordinators.
b. Final approval or disapproval of selection of candidates for the position of interviewer will rest with the local coordinator and the ETS Family Task Force.
c. There will be role-playing situations to test prospective interviewers "under fire."

d. The survey group will maintain a supervisory person who is experienced and well trained in interviewing techniques. Some of his functions will be to assist in hiring and training interviewers and to oversee and validate their work.

It is generally agreed that interviewers will fit the following basic picture as closely as possible:

a. female housewives
b. at least 21 years old
c. high school education
d. residents of the site areas

It is estimated that complete interviews on each family will be submitted to ETS by March, 1969. Our local coordinator will aid the survey group in meeting this deadline.

3. Classroom observations; personality ratings of Head Start (cross-sectional) children. During free play and classroom activities, these children will be observed using PROSE and the personality rating instruments to be used later with the longitudinal study group.

We visualize that many of the people used in phase 2 of the study will be qualified to be trained as classroom observers in subsequent years. However, in the first year this will not be possible, as observations (of cross-sectional groups) and interviews (for longitudinal subject) will occur simultaneously. The local coordinator, who will be thoroughly instructed in each instrument during orientation at Princeton and in the field, may have to do some of the instructing of observers and interviewers on site. ETS staff members engaged in the development of various instruments will assist with this training. Care has been taken to inform communities and prospective coordinators that the interviewers and observers will be recruited locally. The classroom observations will be relatively infrequent (about 10 days in the first year, 20 in subsequent years), and will not require the observer to intervene in the normal work of the classroom. Similarly, the general personality assessments for the cross-sectional group will be carried out with little interference in the Head Start routine. These assessments will take the form of ratings of each child in the normal free-play situations that the program provides.

A key aspect of coordination between our local coordinator and the school system is the joint planning of when these observations should take place. This will minimize the likelihood of friction between teachers and observers.

To aid our observers in identifying the target children in the classroom, pictures will be taken of each child. (For the longitudinal group, pictures will be made every year of the study and copies will be given to the children's mothers for inclusion in a year by year growth book provided by ETS.)

4. Testing centers for longitudinal subjects. The training received by the coordinator at the Princeton office will include extensive orientation on test administration. In addition, a Princeton training team will visit each site to help guarantee the correct administration of the instruments, make a final selection of testers and monitor a one week field test of a local center in operation. Members of this Princeton training team will maintain intermittent checks with the testing centers to enable continuing feedback on the validity of the tests and testing strategies being employed. Technical back up will be continuously available also from ETS regional offices.

To facilitate the smooth operation of the testing phase, present plans call for four test centers located in churches in each city in the study, with a staff at each test center consisting of a supervisor, five testers, and an assistant (who can double as car driver, tester, etc.). A rented car to aid in emergency situations and to bring children to the testing site will also be available at each center. It is estimated that, operating five days a week with an average of twenty-four children tested each day for a week, we will complete the testing cycle in approximately six weeks.

5. Testing cross-sectional subjects. The cross-sectional group of children at present enrolled in Head Start will be subjected to the same set of individual measures planned for the longitudinal group in the second year of the study. This cross-sectional group will be tested again when it reaches the third grade. In instances where the Head Start center does not include adequate testing facilities, children will be taken to a testing center such as that planned for the longitudinal group.

6. Teacher workshops. An important step in the implementation of the project is to provide an opportunity for teachers to become familiar with the project, to understand their role in it, and to express their feelings about it. To help achieve these ends teacher workshops will be held. All assessment instruments which teachers will fill out will be discussed, and in many cases teachers will actually complete them during workshop sessions.

. . .

In the 1969-70 year, we shall repeat certain of the operations described above on a more extensive basis. All subjects in the longitudinal sample will again be brought into centers for a battery of individual tests, and those longitudinal subjects enrolled in Head Start will be monitored through classroom observations. Information will be obtained systematically from their Head Start teachers, and the same sort of information will be obtained about the Head Start Centers as will eventually be collected about the elementary schools. A second interview will be held with the families of all longitudinal subjects.

To obtain base line data, the remaining four cross-sectional groups (kindergarten or second year of Head Start, grade 1, grade 2, and grade 3) will receive all individual and group measures proposed for their comparable longitudinal sample groups, including classroom observations. School records will be used to obtain information about the physical and socioeconomic status of these children. Information will be gathered systematically about the teachers, the schools, and the communities for the cross-sectional groups.

A major consideration will be to set up a system by which we will be able to track longitudinal subjects who have moved out of the neighborhood, city, or state and to arrange means by which information on these children can still be obtained.

Testing Center Procedures

How the testing will be accomplished. In each of the four study cities we will establish four testing centers. Centers will be located in churches and will use the Sunday School classrooms and assembly area. Each test center will be organized, staffed, and equipped to administer the complete test battery to 24 children a week.

A test center staff will consist of one supervisor, one center assistant, and six test administrators. Six test stations will be manned by the test administrators, the assistant will supervise rest and play of children not being tested, and the supervisor will coordinate the flow of children through the alternate test-rest sequence.

In each week a test center will process 24 children: 12 each in 3-hour morning and afternoon sessions. Approximately half of a child's time will be effective testing time. Thus, a six-hour test battery can be administered in four days. The fifth day of the work week will be available for make-up, coding, and other necessary activities.

The first day of a testing cycle will differ from others in that the mother will participate in the mother-child interaction tasks, which will require only an hour and a half at the testing center. Six mothers and their children will be scheduled for each of four one and a half hour periods in the day. Each of the six test administrators will conduct a mother and her child through an hour of interaction tasks. Then the center supervisor and assistant will help the mothers complete some additional questionnaire items relating to community and family variables. Meanwhile, the children will have juice and then go with the testers for 15 to 25 minutes of testing.

Subsequent days will allow each tester to work with two children in each of the morning and afternoon sessions. The two children will alternate between testing and resting, and will normally work with only one test administrator a day.

In a five week period, four sites, each with four test centers operating as described above, can process 1920 children. Testing will continue into a sixth week, during which the number of centers per site (or testers per center) can be adjusted, as needed, to process the remaining children in the sample.

The week following the testing, children will be scheduled for the physical examination. The sequence for those examinations cannot be specified here, as they will depend upon the medical facilities available in the study sites and the wishes of the examining physicians.

Master Schedule for First Year's Operations

Location*	Date	Event
P	Jan. 6-10, 1969	Local Coordinator meeting
P	Jan. 27-28	OEO review of materials ETS regional office representatives meeting
F	Jan. 31	Pilot testing interview completed in Lee County and Portland
P	Feb. 3	All material specifications and test copy completed
F	Feb. 21	Pilot testing interview completed in St. Louis and Trenton
P/F	Feb. 28	Delivery of tests and questionnaires
F	March 3	Deliver test materials Begin training test center staffs
F	March 14	Complete arrangements for test centers
F	March 31	Begin testing in Lee County and Portland
F	April 14	Begin testing in Trenton and St. Louis
F	May 23	Interviews completed in Lee County and Portland
P	June 1	Detailed specifications of operations for second year to OEO
F	June 13	Interviews completed in Trenton and St. Louis Testing completed in Lee County and Portland
F	July 3	Testing completed in Trenton and St. Louis
P	July 11	Coded questionnaires delivered by A&S to ETS
P/F		Final shipment of test results to Princeton
P	Aug. 31	Preliminary report on first year's operations to OEO

* P - Princeton
F - Field Sites

N. SYSTEMS DESIGN AND CONTROL

Albert E. Beaton

The distinction between systems design/control and data analysis is very difficult to define. This is because the design and maintenance of an edited data file require many statistical techniques usually considered the domain of the data analyst, and data analysis on modern computers requires, perhaps implicitly, the organization, editing, and file manipulation techniques of the computer scientist. The ETS statistical system, F4STAT, merges both data handling and statistical functions so that a research person can both organize and analyze his data with a single program and a single pass through a computer. The magnitude of the longitudinal study is such that the two functions must be handled more or less separately, but not without considerable interaction. The same statistical system will be used for work in both areas along with fixed programs for certain routine operations.

The data processing techniques used in a comprehensive longitudinal study necessarily differ from procedures used in other research studies. Although the number of subjects planned is large, it is not excessively large. The comprehensiveness comes from the number of events observed for each subject which, in this case, will far exceed the number of individuals studied. In a sense, this study is a collection of 2,000 case studies of young children with each child studied in minute detail for a number of years. Generality will come from the identification of important variables which discriminate the behavior of small children in different types of programs.

The data on an individual will come from many sources; e.g., from classroom observation, teacher observation, educational tests, and family interviews, and will be recorded on a variety of forms. Many of the measures will be repeated periodically and new instruments will be introduced during the life of the project. Clearly, then, we must examine carefully the methods of collecting data, the detection and correction of errors, the reduction of data to manageable and useful dimensions, and the accessibility of the data for model building and analysis.

Data collection. The many original observations of various measurements will be recorded in various forms depending largely on the convenience of the subject or observer in the field. Whenever possible, the information will be recorded on machine readable answer sheets for automatic transcription by the SCRIBE test scoring machine into computer readable format. The initial data will be organized into files corresponding to particular instruments and, within these files, observations will be sorted by individuals within classroom, school, and community. These various files will be merged into common working files after checking and reduction according to data analytic needs.

Our first problem is, of course, the identification of individuals--a problem of major proportions when students are followed over a long period of time. We must be wary of the possibility of several children with the same name, as well as the problem of changing names, both first and last, during the life of the study. ETS's vast experience in maintaining large data files is of considerable importance. Even so, specific procedures for young and presumably mobile children have been developed for this study.

Our considerations of data collection must also cover the problem of missing information. Missing data on individuals or groups, either on individual variables or whole instruments, causes severe problems in the kinds of analyses contemplated here, which involve interaction. We nonetheless must expect and accept the fact that there will be occasions when measures on whole instruments will be unavailable for many of the subjects. In some cases, the design of the study dictates the absence of data; e.g., non Head Start children cannot be observed in Head Start centers. In other cases, instruments will be missing irregularly; e.g., when students are ill or emigrate from the area. The collection of measures on every possible instrument will be attacked by using the computer to check all incoming instruments against a master list of subjects. A list of subjects on whom information is not available will then be fed back to field representatives. Any measurement deemed to be unrecoverable will be recorded accordingly in the data file.

The updating of data files is, of course, of utmost importance. The master files will be constantly updated with the names of new subjects who transfer in. New information will be added about subjects already recorded. The files will be updated during each year as data arrives, and over years as additional measures are available. The system, therefore, is designed with considerable flexibility not only for file arrangements but also for future requirements not at present foreseen.

Error detection and correction. ETS's long experience in quality control of data has helped considerably in developing checking procedures for the longitudinal study. All hand scored measures will be checked and all keypunching verified. Random samples of machine scored instruments will be rescored by machine and hand checked. Summary statistics will be computed for each measure and these statistics used in scanning the data, judging response patterns, and flagging impossible, improbable, or inconsistent information. Flagged data will be examined with care and corrected.

Data reduction. Neither our statistical nor computer techniques permit all the original information to be analyzed at one time and, in any case, we must aim at forming composite scales that describe the individuals in more comprehensive terms than mere items. Data reduction is, therefore, as much

a statistical and psychological problem as a computing problem. Thus, the computer scientist will work closely with both statistician and psychologist in this phase. As information is reduced to meaningful scores, master files will be created containing summaries of basic information which will then be used in analysis and for logical comparison with future data. It should be noted, however, that the original data will be retained and made available for reanalysis if new strategies of data analysis are developed.

Accessibility. Accessibility is also of prime importance in file construction and maintenance, both for the control of data from the field and for different analyses desired by the many psychologists working on the study. The general procedure will be to develop a working file containing all necessary information for a single analysis or a small set of analyses. The computing procedure consists largely of selecting information about a subject from various files and merging it into the working file, which might contain information on the subject, his school, his teacher, and his community. The file design allows for the selection and grouping of individuals by computable criteria and then formation of groups as requested for analysis. Flexibility is again important since it is impossible to foresee all the directions in which the research will lead us, or to foresee all the demands which may be placed on the data bank in the future.

0. ANALYSIS

Albert E. Beaton

A longitudinal study is necessarily interested in the achievement of children over time and in investigating the changes or growth of children on various variables. Children, indeed, do grow and attain various patterns of achievement, and although their growth patterns are to some degree unique to themselves there are certain common elements. We expect that the Head Start children will behave differently from other similar children in both growth rate and level of achievement. We need, therefore, to generate a theory of how children grow, and then codify this theory in a model of the process of growth. With such a model we can investigate the ways in which Head Start children differ from similar children without Head Start, and how Head Start operates on children to bring about these differences.

The basic design of the longitudinal study is not a perfect experimental design, for it lacks purely random selection of primary sampling units and random assignment of students to Head Start. We cannot randomly assign some children to the Head Start treatment, for this would imply denying Head Start to ones who might otherwise have participated. However, the general approach does qualify as a multiple time series quasi-experimental design, and corresponds to Campbell and Stanley (1963) design No. 14. This design is subject to the error of being unable to assure that there is no interaction between the persons who select themselves for the program and the Head Start program itself. That is, even if the children vary in no other measured way than their parents' choice of Head Start, we still cannot be certain that some unmeasured variable important to educational growth is not "causing" the additional performance instead of the Head Start treatment. In this study, we suspect that there are many measurable precursors to a parent's decision to involve his children in Head Start and our first task is to try to

identify the various patterns of behavior that lead to choice of a Head Start program. This in itself may be a useful typology of characteristics of the disadvantaged. With this information, we will statistically adjust individuals to compensate for such interactions, but we do so in full knowledge that we may never be fully rid of the subject by Head Start interaction.

As the Interim Report (1968) states: "There is no such thing as an analysis of data collected from such a comprehensive program as that proposed." Indeed, this study is extraordinarily comprehensive, for the number of measures (at the item level) collected on individuals will far exceed the number of individuals studied, and even this will only skim the number of ways in which individual children actually differ. In a sense, this project is a series of 2,000 case studies of the development of young children, attempting to find common patterns of growth, attempting to find the precursors and concomitants of growth, and attempting to identify interventions or treatments which help promote the rapid development of disadvantaged children.

A single analysis is out of the question for many reasons. The simple technical problems are sufficient to preclude an overall analysis, since statistical techniques are not adequately developed for sample sizes that are small as compared to the number of variables, and, in any case, no modern high speed computer can reasonably handle--if such handling is possible at all--all measures simultaneously. But, more importantly, there is no single psychological theory specific enough to suggest all relationships among so many variables, and a single analysis might cloud, or hide completely, the discoveries derived from careful consideration of the many smaller parts which unite to form the whole.

The analysis phase begins with a series of analyses investigating each domain of variables (e.g., cognitive/perceptual, personal/social, etc.) within each time period. The main purpose of these studies is to find the underlying dimensions of each domain at each time level so that the development of these factors

in children may be treated over the life of the study. This phase also reduces the data to manageable size for the study of interaction among domains and the development of the general model of child development.

The next major phase is the development of a general model for the development of young children during their preschool and early school years. From the building of the model, we expect to identify important variables that lead to specific criteria either by direct or indirect routes. Hopefully, we will find "links" between the initial variables and the variables measured at the end of the first year, between a combination of the initial and first-year variables and the variables measured at the end of the second year, and so forth. We will then investigate the effects of Head Start variables, including the interaction of Head Start variables and other variables, on the development of children. By investigating various paths to a level of achievement, we investigate not only what effects occurred, but also the way in which they happened.

The analysis of hypotheses about growth is necessarily difficult, for any effects of a particular program may be hidden by other factors in a child's life that also affect his educational progress. This difficulty is not due to the nature of the quasi-experimental design, for the effects of a treatment can be hidden by other factors even in a pure experimental design. The effects of Head Start may be looked on as a signal which we try to detect against background noise. The signal is fixed insofar as we do not actually attempt to maximize it by modifying the treatment. Thus, to detect the signal clearly, the only alternative is to reduce the surrounding noise. We cannot do this by manipulation, so we must statistically control for every possible other variable in order to reduce the noise. This strategy, of course, dictates the importance of collecting as much relevant information as possible about every individual in the study.

The rest of this chapter consists of a discussion of the building of the developmental model; then specific comments for the transition between two time periods, then among several time periods; and, finally, comments about the analysis of the variables within a single time period.

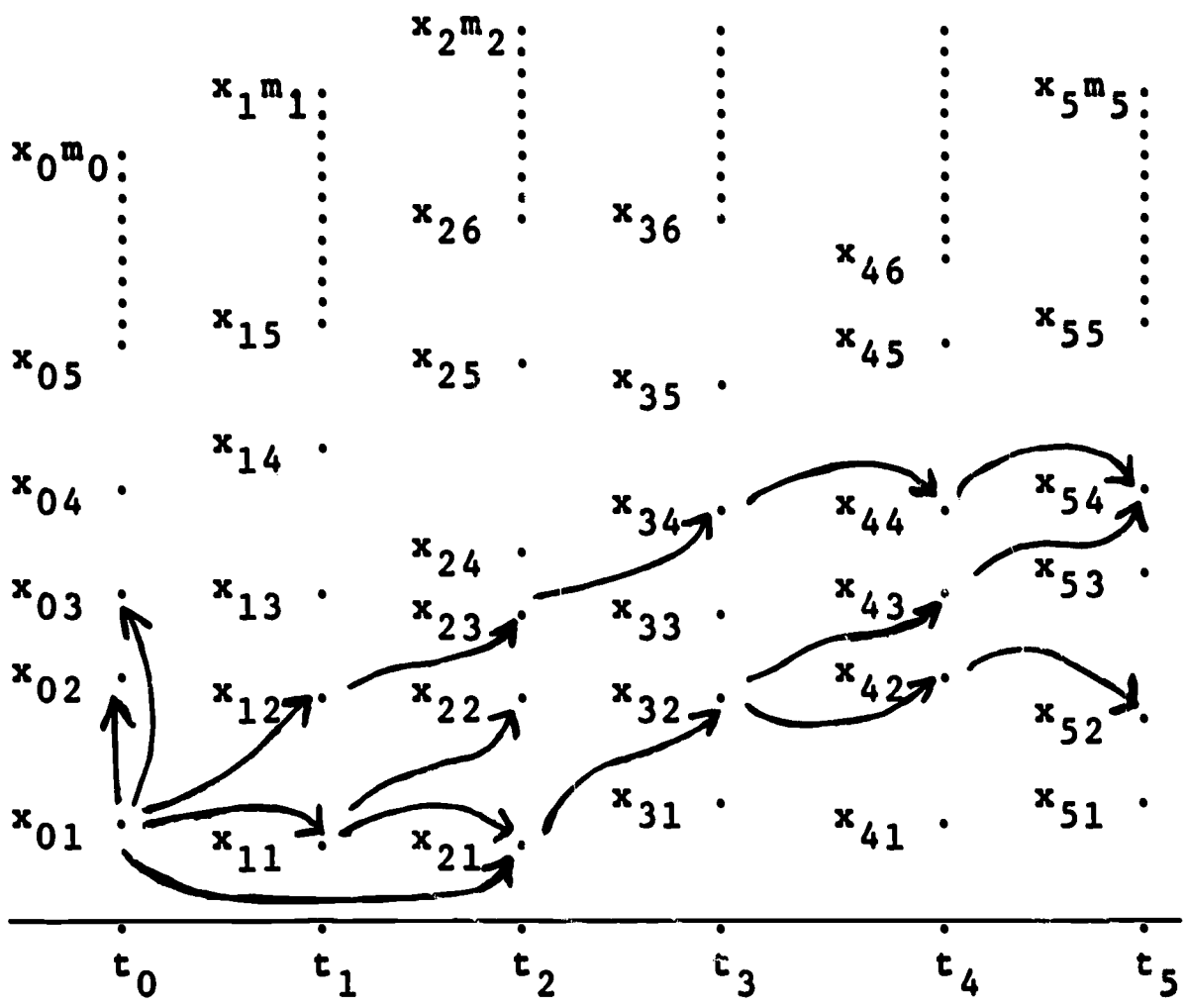
General model. Let us consider the development of children over the life of this study. We measure the children before they are eligible for Head Start. We measure them on a number of variables and we also measure their environment on variables that may affect their school performance. We will call these m_0 measures $x_{01}, x_{02}, \ldots x_{0m_0}$ or a single variable x_{0j}. The first subscript refers, of course, to the year of the study, t_0. During the succeeding years, t_1 through t_5, we collect additional variables x_{1j} through x_{5j} on largely the same variables, although many may be added, deleted, or modified. Thus, we end the study with a data matrix X_t for each year t, and each data matrix contains as many rows as children in the study that year and as many columns as variables measured.

The data collected within a year will be of many different types. They are first divided into domains (i.e., cognitive/perceptual, personal/social, etc.) and then divided into subdomains, and finally into individual variables. We will assume throughout this discussion of analysis that the original data have been reduced by careful inspection and/or factor analysis to a manageable number at any time period. The variables in a block may contain both status or achievement variables, and also treatment variables such as teaching method or intensity of program. Note that the variables may be collected throughout the year, not necessarily at one particular session within the year. The variables in a block may also contain product variables representing interaction between status variables or between status variables and treatments.

The variables may be represented graphically as in Figure N.1. The variables are organized in columns representing the year of the study. The relative position in a column is not

Figure N.1

NETWORK OF POSSIBLE EFFECTS OF x_1



relevant; thus the points representing variables may be rearranged at will. Using this graph, we postulate a network of relationships among the variables. Figure N.1 contains a possible network for the effect of variable x_{01} on other variables in the study. Note that links are directional; i.e., they must point to variables with the same time slice or in future slices, but not backwards. The links may be bidirectional within a time slice. For convenience, we will classify links into three types and study them separately. The three types are links from one time slice to the next, links more than one time slice away, and links within a time slice.

General model: Between time periods. The model of growth between two time periods presumes that a child's growth and achievements at one time are functions of his previous levels of ability and growth pattern up to the previous time point, and it also presumes that his achievement is a function of the treatments or education to which he has been exposed during the previous slice. We do not expect our model to fit perfectly because of various types of error which can come from imperfections in measures, missing variables which are relevant, and simple sampling variation. An analysis will focus on the development of a transformation matrix which describes the growth between the prior and posterior time points. The analysis will be performed between each pair of time points.

Let us consider the sets of data at our initial time point t_0 and after the first year t_1. The data will consist of two matrices X_0 and X_1, the first containing m_0 columns representing the variables measured at t_0 and X_1 with m_1 columns representing the variables selected at t_1. Both X_0 and X_1 contain the data on about 2,000 individual students on whom both sets of measures were collected.

We now postulate a transformation T_0 which encodes our theory about the relationship of X_0 to X_1. The matrices are of the form shown in Figure N.2. The matrix T_0 transforms the data from X_0 to X_1. We presume that the variables in X_1 can be

Figure N.2

TRANSFORMATION MATRIX T_0

	x_{11}	x_{12}			x_{1j}			x_{1m_1}
x_{01}	t_{011}	t_{012}	. . .		t_{01j}	. . .		t_{01m_1}
x_{02}	t_{021}	t_{022}	. . .		t_{02j}	. . .		t_{02m_1}
.	.	.	.		.			.
.	.	.		.	.			.
.	.	.		.	.			.
x_{0i}	t_{0i1}	t_{0i2}	. . .		t_{0ij}	. . .		t_{0im_1}
.	.	.			.	.		.
.	.	.			.		. .	.
.	.	.			.			.
.	.	.			.		. .	.
x_{0m_0}	t_{0m_01}	t_{0m_02}	. . .		t_{0m_0j}	. . .		$t_{0m_0m_1}$

explained by a linear combination of the variables at X_0. Rows in T_0 represent the variables in X_0 and the columns represent those in X_1. The elements of T_0 (e.g., t_{0ij}) represent the coefficients of the linear transformation. Explicitly, the transformation matrix says that a variable at $t_1 x_{1j}$, say, may be explained by

$$x_{1j} = \sum_{i=1}^{m_0} t_{0ij} x_{0i} + e$$

The subscripts identifying individuals have been omitted from x_{1j}, x_{0i} and e for convenience.

The elements of the matrix T_0 may be defined from theoretical considerations of relationships or from prior studies. In terms of Figure N.1, this matrix describes the arrows, but, for the most part, we encode null relationships; i.e., we postulate that certain variables in X_0 have no effect on certain variables in X_1. However, we are free to hypothesize any constant we wish. The formation of this matrix is related to the models described in Blalock (1964).

The next step is to estimate the values of the coefficients not explicitly defined in T_0 by least squares. The procedure is to define a matrix $\hat{T}_0$, the j^{th} column of which contains the postulated parameters from T_0 and the partial regression coefficients for predicting X_{1j} from the variables without hypothesized coefficients.

We then have a matrix for transforming X_0 to $\hat{X}_1$, our estimate of X_1. We measure the difference between our estimates and the actual values of X_1 by defining the matrix

$$\hat{E}_1 = X_1 - \hat{X}_1$$

and computing a covariance matrix of residuals

$$\hat{R}_1 = \hat{E}_1' \hat{E}_1$$

R_1 is a measure of the lack of fit of our hypothesized model. If the model fits perfectly, then all elements of this matrix would be zero. The diagonal elements indicate how well each X_{1j} ...

is fit from the model, and the off-diagonals indicate how the error in estimation of one variable covaries with another.

If we are not satisfied with the fit, then we must correct our model. We can approach this by inspection of residuals for clues to the lack of fit. Large diagonal elements indicate variables that are poorly explained, and we may reconsider the prior variables which we had considered unrelated. A nonzero off-diagonal leads us to speculate as to what might be missing that could affect pairs of variables in the same manner. An obvious procedure to identify sources of nonfit that permeate many variables is factor analysis. Inspection of such factors might lead to suggestions for respecifications of the model and productive refitting.

One special case of this procedure is an initial hypothesis that all variables measured at t_0 "cause" or affect in some way the variables at t_1. Operationally, this is identical to the sequential block factor analysis described in the Interim Report (1968)--except that blocks are here defined as single time slices, whereas time slices in the Interim Report were subdivided into domain blocks. This approach is in a sense conservative, for we risk no faulty hypotheses, but it does not take into account theoretical considerations or parameters from past experiments, except in the implicit sense of having selected variables for their "causal" properties in the first place. This type of model is useful, though, for the residual matrix computed under this model will be the minimum possible error matrix using this procedure with these data. This residual matrix and the residual matrix computed under a more restrictive model can be compared to measure the loss of information due to the hypotheses. In fact, a comparison of the diagonals of these two residual matrices adjusted by the appropriate degrees of freedom would generate a series of F ratios for testing the restricted model under usual Normal theory.

We note the similarity between this technique and Hotelling's (1936) "most predictable criterion," better known as the canonical

correlation. If we work under the hypothesis that all variables in X_0 may affect those in X_1, then a principal component's factor analysis of the residual matrix computes factors differing from the canonical vectors of canonical analysis by only a simple linear transformation. We can, therefore, examine and interpret the canonical vectors to see if they represent useful dimensions.

The specification of hypotheses or parameters, and fitting new models, should be repeated until the fit is sufficiently accurate. If we do not reach a point at which we feel the data in X_0 predict X_1 sufficiently well, then we must try to augment X by additional variables lost in the data reduction, or acknowledge that something is happening to the children which our model does not explain. The study can use these changes, however, as an unpredicted growth variable and as a precursor of future growth.

The result of this procedure is a definition of the ways in which children grow between two time periods. The matrix can be used to investigate the effect on a t_1 variable of a t_0 variable in the multiple regression sense. We also have measures of how well our models fit the data as measured.

General model: Among time periods. The transition between any two time periods is the same as that described for the transition from t_0 to t_1. For example, the transition from t_1 to t_2 is described by

$$X_1\hat{T}_1 = \hat{X}_2$$

and a residual matrix is analyzed as before. Now substituting the identity

$$X_1 = \hat{X}_1 + \hat{E}_1 = X_0\hat{T}_0 + \hat{E}_1$$

into our model we see that

$$X_2 = (X_0\hat{T}_0 + \hat{E}_1)T_1 \text{ or}$$

$$X_2 = X_0\hat{T}_0\hat{T}_1 + \hat{E}_1T_1$$

which is a recursive relationship such that

$$X_t = X_0T_0T_1\cdots T_{t-1} + E_1T_1T_2\cdots T_{t-1} + \cdots + E_{t-1}T_{t-1}$$

that is, the status of a child at any time is a function of his initial condition times a series of transformations and the unique variation at each point in time suitably transformed. Stated another way, we have described the status of a variable as a function of the initial condition of the variable and change (or growth) that is orthogonal to the initial condition at the various stages. The transformation matrices include our a priori information as well as fits from data. The effects of Head Start are described by the effect that Head Start treatment has on the transformations either by a direct or an interactive route.

General model: Within blocks. As mentioned above, the Interim Report (1968) defined blocks as domains within a time schedule. The method proposed here is perfectly consistent with that definition if we decide on an ordering of variables within a time slice. We can simply define a transformation from the first domain within a time slice as an estimator of another block within that same time. The direction is, then, from block to block within a time slice and then from time slice to time slice.

In the terminology of the previous sections, this is equivalent to transforming X_0 into itself, with the only necessary restriction that a variable is not used as its own predictor, for this would, of course, generate a perfect prediction which is of no interest. If we can specify directional interrelationships (actually nonrelationships) among variables, then we can so postulate a transformation matrix and fit it in the same way as in the between time slice analysis.

An interesting note is an extreme case of this procedure: if we presume that every variable within a group affects every other variable but itself, then the computed residual matrix will be the anti-image matrix described by Harris and Kaiser (1963). The covariance matrix of the estimated scores is the image matrix itself. Thus, using this technique, we are in the familiar territory of image factor analysis.

REFERENCES

Abravanel, E. Intersensory integration of spatial position during early childhood. Perceptual and Motor Skills, 1968, 26(1), 251.

Aikin, W. M. The Story of the Eight-Year Study. New York: Harper & Brothers, 1942.

Allison, R. B. Learning parameters and human abilities. ONR Technical Report and doctoral dissertation, Princeton University. Princeton, N.J.: Educational Testing Service, 1960.

Almy, M., Chittenden, E., & Miller, P. Young children's thinking. New York: Teachers College Press, Columbia University, 1966.

Anastasi, A. Psychological testing. New York: Macmillan, 1968.

Anderson, H. H. Domination and social integration in the behavior of kindergarten children and teachers. Genetic Psychology Monographs. 1939, 21, 287-385.

Arasteh, J. D. Creativity and related processes in the young child: A review of the literature. Journal of Genetic Psychology, 1968, 112, 77-108.

Archibald, H. Notes on the culture of the urban Negro child. Religious Education, 1967, 62, 321-326.

Aronfreed, J. The origin of self-criticism. Psychological Review, 1964, 71, 193-218.

Asch, S. E. Forming impressions of personality. Journal of Abnormal and Social Psychology, 1946, 41, 258-290.

Atkinson, J. W., & Feather, N. T. (Eds.) A theory of achievement motivation. New York: Wiley, 1966.

Atkinson, J. W., Heyns, R. W., & Veroff, J. The effect of experimental arousal of the affiliation motive on thematic apperception. Journal of Abnormal and Social Psychology, 1954, 49, 405-410.

Baldwin, A. L. Theories of child development. New York: Wiley, 1967.

Bandura, A., Ross, D., & Ross, S. A. Imitation of film-mediated aggressive models. Journal of Abnormal and Social Psychology, 1963, 66, 3-11.

Bandura, A., & Walters, R. H. Aggression. In H. W. Stevenson (Ed.), Child psychology. The 62nd Yearbook of the National Society for the Study of Education. Part 1. Chicago: University of Chicago Press, 1963. Pp. 364-415. (a)

Bandura, A., & Walters, R. Social learning and personality development. New York: Holt, Rinehart & Winston, 1963. (b)

Banta, T. J. Tests for the evaluation of early childhood education: The Cincinnati Autonomy Test Battery (CATB). In J. Hellmuth (Ed.), Cognitive studies, Vol. 1. Seattle: Special Child Publications, 1968, in press.

Baral, D. P., Snow, R. E., & Allen, D. W. A taxonomy of teaching behavior: Progress report. Stanford University, United States Department of Health, Education and Welfare, Contract No. OE-6-10-078, Project No. 5-0252-0502, 1968.

Barbar, B. Family status, local-community status and social stratification: Three types of social ranking. Pacific Sociological Review, 1961, 4(1), 3-10.

Barron, F. Creativity and psychological health. Princeton, N.J.: Van Nostrand, 1963.

Baumrind, D. Child training antecedents of preschool behavior: Structured observation as an experimental procedure. Paper presented at the meeting of the Society for Research in Child Development, Berkeley, 1963.

Bayley, N., & Schaefer, E. S. Correlations of maternal and child behaviors with the development of mental abilities. Monographs of the Society for Research in Child Development, 1964, 29(6), 97.

Bear, R. M., Hess, R. D., & Shipman, V. C. Social class differences in maternal attitudes toward school and the consequences for cognitive development in the young child. Paper presented at the meetings of the American Educational Research Association, Chicago, February 1966. (a)

Bear, R. M., Hess, R. D., & Shipman, V. C. Social class differences in maternal attitudes toward the teacher and school. Paper presented at meetings of the American Psychological Association, New York City, September 1966. (b)

Becker, W. C., & Krug, R. S. A circumplex model for social behavior in children. Child Development, 1964, 35, 371-396.

Beery, K. E. Visual motor integration. Monograph. Chicago: Follett, 1967.

Bell, R. Q. Retrospective attitude studies of parent-child relations. Child Development, 1958, 29, 323-338.

Bell, W., & Greer, S. Discussion of social area analysis, pro and con. Pacific Sociological Review, 1962, 5, 3-16.

Bellack, A. A., Kliebard, H. M., Hyman, R. T., & Smith, F. L., Jr. The language of the classroom. New York: Teachers College, Columbia University, 1966.

Beller, E. K. Dependency and independene in young children. Journal of Genetic Psychology, 1955, 87, 25-35.

Bennett, F. Research viewed from inside the test tube. American Psychologist, 1968, 23, 827-828.

Bereiter, L. C., & Engelmann, S. Teaching disadvantaged children in the preschool. Englewood Cliffs, N.J.: Prentice-Hall, 1966.

Berlyne, D. E. Conflict arousal and curiosity. New York: McGraw-Hill, 1960.

Bernstein, B. Social class and linguistic development. In A. H. Halsey, J. Floud, and A. Anderson (Eds.), Society, economy, and education. Glencoe, Ill.: Free Press, 1961.

Bernstein, B. Family role systems, communication, and socialization. Paper presented at Conference on Development of Cross-National Research on the Education of Children and Adolescents, University of Chicago, February 1964.

Beshers, J. Urban social structure. New York: Free Press, 1962. Pp. 127-158.

Bieri, J. Complexity-simplicity as a personality variable in cognitive and preferential behavior. In D. W. Fiske and S. R. Maddi (Eds.), Functions of varied experience. Homewood, Ills: Dorsey Press, 1961.

Bieri, J., Atkins, A. L., Briar, S., Leaman, R. L., Miller, H., & Tripodi, T. Clinical and social judgment: The discrimination of behavioral information. New York: Wiley, 1966.

Birch, H. G., & Lefford, A. Intersensory development in children. Monographs of the Society for Research in Child Development, 1963, 28 (5, Serial No. 89).

Birch, H. G., & Lefford, A. Two strategies for studying perception in "brain-damaged" children. In H. G. Birch (Ed.), Brain damage in children: Biological and social aspects. Baltimore: Williams & Wilkins, 1964.

Birch, H. G., & Lefford, A. Visual differentiation, intersensory integration, and voluntary motor control. Monographs of the Society for Research in Child Development, 1967, 32 (2, Serial No. 110).

Black, M. S. The development of personality factors in children and adolescents. Educational and Psychological Measurement, 1965, 25, 767-785.

Blalock, H. M. Causal inferences in nonexperimental research. Chapel Hill, N.C.: University of North Carolina Press, 1964,

Blau, P. Structural effects. American Sociological Review, 1960, 25, 178-180.

Bloom, B. Stability and change in human characteristics. New York: Wiley, 1964.

Boring, E. A. A history of experimental psychology. (2nd ed.) New York: Appleton-Century-Crofts, 1957.

Bower, T. G. R. The visual world of infants. Scientific American, 1966, 215(6), 80-92.

Broadbent, D. E. A mechanical model for human attention and immediate memory. Psychological Review, 1957, 64, 205-215.

Broadbent, D. E. Perception and communication. New York: Pergamon Press, 1958.

Bronfenbrenner, U., Harding, J., & Gallwey, M. The measurement of skill in social perception. In D. C. McClelland, A. L. Bald

Bronson, W. C. Central orientations: A study of behavior organization from childhood to adolescence. Child Development, 1966, 37, 125-155.

Brooks, G. The Beaneaters. New York: Harper, 1960.

Broverman, D. M. Cognitive style and intra-individual variation in abilities. Journal of Personality, 1960, 28, 240-256. (a)

Broverman, D. M. Dimensions of cognitive style. Journal of Personality, 1960, 28, 167-185. (b)

Broverman, D. M. Generality and behavioral correlates of cognitive styles. Journal of Consulting Psychology, 1964, 28, 487-500.

Brown, C. Manchild in the promised land. New York: Macmillan, 1965.

Brown, R., & Bellugi, U. Three processes in the child's acquisition of syntax. Harvard Educational Review, 1964, 34, 133-151.

Bruner, J. S. The process of education. New York: Vintage Books, 1960.

Bruner, J. S., Goodnow, J. J., & Austin, G. A. A study of thinking. New York: Wiley, 1956.

Bruner, J. S., Olver, R. R., & Greenfield, P. M. Studies in cognitive growth. New York: Wiley, 1966.

Bruner, J. S., & Tajfel, H. Cognitive risk and environmental change. Journal of Abnormal and Social Psychology, 1961, 62, 231-241.

Bunderson, C. V. Transfer of mental abilities at different stages of practice in the solution of concept problems. Research Bulletin 67-20. Princeton, N. J.: Educational Testing Service, 1967.

Burt, C. V. The structure of the mind: a review of the results of factor analysis. British Journal of Educational Psychology, 1949, 19, 100-111; 176-199.

Bussis, A., Orost, J., Papanek, M., & Tanaka, M. Teaching classification concepts to disadvantaged children. Research Bulletin. Princeton, N.J.: Educational Testing Service, in preparation.

Caldwell, B. M. The effects of infant care. In M. L. Hoffman and L. W. Hoffman (Eds.), Review of child development research. Vol. 1. New York: Russell Sage Foundation, 1964. Pp. 9-88.

Calfee, R. C., & Venetzky, R. L. Component skills in beginning reading. Technical Report No. 60, Wisconsin Research and Development Center for Cognitive Learning, 1968.

Campbell, D. T., & Fiske, D. W. Convergent and discriminant validation by the multitrait-multimethod matrix. Psychological Bulletin, 1959, 56, 81-105.

Campbell, D. T., & Stanley, J. C. Experimental and quasi-experimental designs for research in teaching. In N. L. Gage (Ed.), Handbook of research on teaching. Chicago: Rand McNally, 1963.

Campbell, J. D. Peer relations in childhood. In M. L. Hoffman and L. W. Hoffman (Eds.), Review of child development research. Vol. 1 New York: Russell Sage Foundation, 1964. Pp. 289-322.

Carroll, J. B. Language and thought. Englewood Cliffs, N. J.: Prentice-Hall, 1964.

Carroll, J. B. Review of The nature of human intelligence. American Educational Research Journal, 1968, 5, 249-256.

Cattell, R. B. The measurements of adult intelligence. Psychological Bulletin, 1943, 40, 153-193.

Cattell, R. B. Theory of fluid and crystallized intelligence: A critical experiment. Journal of Educational Psychology, 1963, 54, 1-22.

Cazden, C. Subcultural differences in child language: An inter-disciplinary review. Merrill-Palmer Quarterly, 1966, 12, 185-219.

Chance, J. Mother-child relations and children's achievement. Final Report. USPHS Research Grant MHO 5268, 1968.

Chandler, M. Project Head Start and the culturally deprived in Rochester, New York: A study of participating and non participating families in areas served by Project Head Start in Rochester. OEO Report, January 1966.

Chittenden, G. E. An experimental study in measuring and modifying assertive behavior in young children. Monographs of the Society for Research in Child Development, 1942, 7, (1, Serial No. 31).

Clarizio, H. F. Maternal attitude change associated with involvement in Project Head Start. Journal of Negro Education, 1968, 37, 106-113.

Clements, S. D., & Peters, J. E. Minimal brain dysfunction in the school-age child: Diagnosis and treatment. Archives of General Psychiatry, 1962, 6, 185-197.

Coan, R. W. Facts, factors, and artifacts: The quest for psychological meaning. Psychological Review, 1964, 71, 123-140.

Coleman, J. S. et al. Equality of educational opportunity. Washington, D. C.: Government Printing Office, 1966.

Cooperative Test Division. Handbook: Cooperative Primary Tests. Princeton, N. J.: Educational Testing Service, 1967.

Cowen, P. A. Cognitive egocentrism and social interaction in children. Paper presented at the meeting of the American Psychological Association, New York, September 1966.

Cox, F. N. Some relationships between test anxiety, presence or absence of male persons, and boys' performance on a repetitive motor task. Journal of Experimental Child Psychology, 1968, 6, 1-12.

Crandall, V. C. Achievement behavior in young children. Young Children 1964, 20, 77-90.

Crandall, V. C., Katkovsky, W., & Crandall, V. J. Children's beliefs in their own control of reinforcements in intellectual-academic situations. Child Development, 1965, 36, 91-109.

Crandall, V. J. Achievement. In H. W. Stevenson (Ed.), Child psychology. The 62nd Yearbook of the National Society for the Study of Education. Part 1. Chicago: Chicago University Press, 1963. Pp. 416-459.

Crandall, V. J., Preston, A., & Robson, A. Maternal reactions and the development of independence and achievement behavior in young children. Child Development, 1960, 31, 243-251.

Cravioto, J., DeLicardie, E., & Birch, H. Nutrition, growth, and neurointegrative development: An experimental and etologic study. Supplement to Pediatrics, 1966, 38(2), Part II. Evanston, Ill.: American Academy of Pediatrics.

Cronbach, L. J. Essentials of psychological testing. New York: Harper & Brothers, 1960.

Crossman, E. R. F. W. Information process in human skill. British Medical Bulletin, 1964, 20, 32-37. (Cited in J. P. Guilford, The nature of human intelligence. New York: McGraw-Hill, 1967.)

Crutchfield, R. S. Creative thinking in children: Its teaching and testing. In O. G. Brim, Jr., R. S. Crutchfield, and W. H. Holtzman (Eds.), Intelligence: Perspectives 1965. New York: Harcourt, Brace & World, 1966. Pp. 33-64.

Damarin, F. L., Jr., & Cattell, R. B. Personality factors in early childhood and their relation to intelligence. Monographs of the Society for Research in Child Development, 1968, 33, (6, Serial No. 122).

Dave, R. H. The identification and measurement of environmental process variables that are related to educational achievement. Unpublished doctoral dissertation, University of Chicago, 1963.

Davis, J. A., Spaeth, J. L., & Husen, C. A technique for analyzing the effects of group composition. American Sociological Review, 1961, 26, 215-225.

Denner, B., & Cashdon, S. Sensory processing and the recognition of forms in nursery school children. British Journal of Psychology, 1967, 58, 101.

Dentler, R. A., & Mackler, B. Originality: Some social and personal determinants. Behavior Science, 1964, 9, 1-7.

Deutsch, M. The disadvantaged child and the learning process. In A. H. Passow (Ed.), Education in depressed areas. New York: Columbia University, Teachers College Press, 1963.

Diggory, J. C. Self-evaluation: Concepts and studies. New York: Wiley, 1966.

Dyk, R. B., & Witkin, H. A. Family experiences related to the development of differentiation in children. Child Development, 1965, 36, 21-55.

Educational Testing Service. Assessment and development of cognitive skills in young children. Report of Progress to the Carnegie Corporation of New York. Unpublished manuscript, 1967.

Egeland, B. Influence of examiner and examinee anxiety on WISC performance. Psychological Reports, 1967, 21, 409-444.

Elkind, D. Piaget's conservation problems. Child Development, 1967, 38, 15-27.

El-Koussy, A. H. Trends of research in space abilities. International colloquium on factor analysis. Paris, 1955.

Elliott, R. Physiological activity and performance: A comparison of kindergarten children with adults. Psychological Monographs: General and Applied, 1964, 78, (10, Whole No. 587)

Elliott, R. Physiological activity and performance in children and adults: A two year follow up. Journal of Experimental Child Psychology, 1966, 4, 58-80.

Emmerich, W. Continuity and stability in early social development. Child Development, 1964, 35, 311-332.

Emmerich, W. Continuity and stability in early social development: II. Teacher ratings. Child Development, 1966, 37, 17-27. (a)

Emmerich, W. Personality assessments conceptualized as perspectives. Journal of Projective Techniques and Personality Assessment, 1966, 30, 307-318. (b)

Emmerich, W. Personality development and concepts of structure. Child Development, 1968, 39, 671-690.

Endler, N. S., Hunt, J. McV., & Rosenstein, A. J. An S-R inventory of anxiousness. Psychological Monographs: General and Applied, 1962, 76 (17, Whole No. 536).

Endsley, R. C. Determinants of frustration and its motivational consequences in young children. In W. W. Hartup and N. L. Smothergill (Eds.), The young child: Reviews of research. Washington, D.C.: National Association for the Education of Young Children, 1967. Pp. 155-164.

Erickson, E. Identity, youth and crisis. New York: Norton, 1968.

Fantz, R. L. The origin of form perception. Scientific American, 1961, 204(5), 66-72.

Farnham-Diggory, S. Symbol and synthesis in experimental "reading." Child Development, 1967, 38(1), 221-231.

Farwell, L. Reactions of kindergarten, first- and second-grade children to constructive play materials. Genetic Psychology Monographs, 1930, 8, 431-562.

Feldman, J. Simulation of behavior in the binary choice experiment. In E. A. Feigenbaum and J. Feldman (Eds.), Computers and thought. New York: McGraw-Hill, 1963.

Fellows, B. J. The discrimination process and development. New York: Pergamon Press, 1968.

Ferguson, G. A. On learning and human ability. Canadian Journal of Psychology, 1954, 8, 95-112.

Ferguson, G. A. On transfer and the abilities of man. Canadian Journal of Psychology, 1956, 10, 121-131.

Feshbach, N. D., & Roe, K. Empathy in six- and seven-year-olds. Child Development, 1968, 39, 133-145.

Festinger, L. A theory of cognitive dissonance. Stanford: Stanford University Press, 1957.

Festinger, L., Schachter, S., & Back, K. Social pressure in informal groups. New York: Harpers, 1950.

Firey, W. Sentiment and symbolism as ecological variables. American Sociological Review, 1945, 10, 140-148.

Firey, W. Land use in central Boston. Cambridge, Mass.: Harvard University Press, 1947.

Fitzgibbons, D., Goldberger, L., & Eagle, M. Field dependence and memory for incidental material. Perceptual and Motor Skills, 1965, 21, 743-749.

Flanders, N. Interaction analysis in the classroom: A manual for observers. Minneapolis: University of Minnesota, 1960. (Mimeographed)

Flavell, J. H. Developmental psychology of Jean Piaget. Princeton, N.J.: Van Nostrand, 1963.

Fleishman, E. A. Human abilities and the acquisition of skills. Washington, D.C.: American Institutes for Research, 1966.

Forgus, R. H. Perception: The basic process in cognitive development. Hightstown, N.J.: McGraw-Hill, 1966.

Form, W. H., & Stone, G. P. Urbanism, anonymity and status symbolism. American Journal of Sociology, 1957, 62, 504-514.

Formanek, R., & Morine, G. Categorizing in young children: Two views. Teachers College Record, 1968, 69(5), 409-420.

Freeberg, N. E., & Payne, D. T. Dimensions of parental practice concerned with cognitive development in the preschool child. Journal of Genetic Psychology, 1967, 3, 245-261.

French, J., Ekstrom, R., & Price, L. Manual for kit of reference tests for cognitive factors. Princeton, N.J.: Educational Testing Service, 1963.

Freud, A. Normality and pathology in children. New York: International Universities Press, 1965.

Gagne, R. The conditions of learning. New York: Holt, Rinehart & Winston, 1965.

Gagne, R. Contributions of learning to human development. Psychological Review, 1968, 75, 177-191.

Gans, H. The urban villagers. New York: The Free Press of Glencoe, 1962.

Gardner, R. W., Holzman, P. S., Klein, G. S., Linton, H. B., & Spence, D. P. Cognitive control: A study of individual consistencies in cognitive behavior. Psychological Issues, 1959, 1 (4, Monograph No. 4).

Gardner, R. W., Jackson, D. N., & Messick, S. Personality organization in cognitive controls and intellectual abilities. Psychological Issues, 1960, 2 (4, Monograph No. 8)

Gardner, R. W., & Long, R. I. Control, defence, and centration effect: A study of scanning behavior. British Journal of Psychology, 1962, 53, 129-140.

Gardner, R. W., & Moriarity, A. Personality development at preadolescence: Explorations of structure formation. Seattle: University of Washington Press, 1968.

Gardner, R. W., & Schoen, R. A. Differentiation and abstraction in concept formation. Psychological Monographs: General and Applied, 1962, 76, (41, Whole No. 560).

Garrett, H. E. A developmental theory of intelligence. American Psychologist, 1946, 1, 372-378.

Gesell, A. Children from five to ten. New York: Harper, 1946.

Getzels, J. W., & Jackson, P. W. Creativity and intelligence. New York: Wiley, 1962.

Gewirtz, J. L. Studies in word fluency. I. Its relation to vocabulary and mental age in young children. Journal of Genetic Psychology, 1948, 72, 165-176.

Ghiselin, B. The creative process. Berkeley: University of California Press, 1952.

Gibson, E. Improvement in perceptual judgment as a function of controlled practice or training. Psychological Bulletin, 1953, 50, 401-431.

Gibson, E. Learning to read. Science, 1965, 148, 1066-1072.

Gibson, E., & Gibson, J. J. Perceptual learning: Differentiation or enrichment? Psychological Review, 1955, 62, 32-41.

Gibson, E., Gibson, J. J., Pick, A., & Osser, H. A developmental study of the discrimination of letter-like forms. Journal of Comparative and Physiological Psychology, 1962, 55(6), 897-906.

Gibson, E., Osser, H., Schiff, W., & Smith, J. An analysis of critical features of letters, tested by a confusion matrix. In H. Levin, E. Gibson, A. Baldwin, J. Gibson, C. Hockett, H. Ricciuti, and G. Suci (Eds.), A basic research program on reading. Cooperative Research Project No. 639. Ithaca, N.Y.: Cornell University, 1963.

Golann, S. E. Psychological study of creativity. Psychological Bulletin, 1963, 60, 548-565.

Goldman, A. E. A comparative developmental approach to schizophrenia. Psychological Bulletin, 1962, 59(1), 57-69.

Goodenough, D. R., & Karp, S. A. Field dependence and intellectual functioning. Journal of Abnormal and Social Psychology, 1961, 63, 241-246.

Goodenough, F. L. Measurement of intelligence by drawings. New York: World Book, 1926.

Gordon, E. The child: His cognitive, personal-social, and physical development--a false trichotomy? Speech presented at a special symposium of the National Council on Measurement in Education, New York City, November 1968.

Goslin, D. A. The school in contemporary society. Chicago: Scott, Foresman, 1965.

Gray, S., & Klaus, R. An experimental preschool program for culturally deprived children. Child Development, 1965, 36, 887-898.

Gray, S., Klaus, R., Miller, B., & Forrester, J. Before first grade. New York: Teachers College Press, 1966.

Green, B. F. Attitude measurement. In G. Lindzey (Ed.), Handbook of social psychology. Vol. 1. Cambridge, Mass.: Addison-Wesley, 1954.

Green, R., Hofmann, L., & Morgan, R. Some effects of deprivation on intelligence, achievement and cognitive growth. Journal of Negro Education, 1967, 36, 5-14.

Greer, S. The emerging city. New York: The Free Press of Glencoe, 1962.

Greer, S., & Kube, E. Urbansim and social structure: A Los Angeles study. In M. B. Sussman (Ed.), Community structure and analysis. New York: Crowell, 1959. Pp. 93-112.

Grim, P. A sustained attention comparison of children and adults using reaction time set and the GSR. Journal of Experimental Child Psychology, 1967, 5(1), 26-38.

Guilford, J. P. The structure of intellect. Psychological Bulletin, 1956, 53, 267-293.

Guilford, J. P. Personality. New York: McGraw-Hill, 1959. (a)

Guilford, J. P. Three faces of intellect. American Psychologist, 1959, 14, 469-479. (b)

Guilford, J. P. Traits of creativity. In H. Anderson (Ed.), Creativity and its cultivation. New York: Harper, 1959. Pp. 142-161. (c)

Guilford, J. P. The nature of human intelligence. New York: McGraw-Hill, 1967.

Guilford, J. P., & Hoepfner, R. Structure-of-intellect factors and their tests, 1966. Los Angeles: University of Southern California Psychology Laboratory. Report No. 36, 1966.

Guilford, J. P., Kettner, N. W., & Christensen, P. R. A factor-analytic study across the domains of reasoning, creativity, and evaluation. II. Administration of tests and analysis of results. Los Angeles: University of Southern California Psychological Laboratory. Report No. 16, 1956.

Guilford, J. P., & Lacey, J. I. (Eds.) Printed classification tests: Army Air Force Aviation Psychology Research Program Reports. Report No. 5. Washington, D.C.: Government Printing Office, 1947.

Gurin, P., & Katz, D. Motivation and aspiration in the Negro college. Washington, D.C.: U. S. Department of Health, Education and Welfare, Office of Education. Final Report, November 1966.

Guttman, L. What lies ahead for factor analysis? Educational and Psychological Measurement, 1958, 18(3), 497-515.

Haan, N. G. Proposed model of ego functioning: Coping and defense mechanisms in relationship to IQ change. Psychological Monographs: General and Applied, 1963, 77 (8, Whole No. 571).

Hagen, J. W., & Saba, R. A. A developmental study of selective attention. Merrill-Palmer Quarterly, 1967, 13, 159-172.

Halpin, A. W. Theory and Research and Administration. New York: Macmillan, 1966.

Halstead, W. C. Brain and intelligence: A quantitative study of the cerebral lobes. Chicago: University of Chicago Press, 1941.

Harlow, H. F. The formation of learning sets. Psychological Review, 1949, 56, 51-65.

Harlow, H. F. The nature of love. American Psychologist, 1958, 13, 673-685.

Hartup, W. W. Dependence and independence. In H. W. Stevenson (Ed.), Child psychology. The 62nd Yearbook of the National Society for the Study of Education. Part 1. Chicago: University of Chicago Press, 1963. Pp. 333-363.

Hartup, W. W. Peers as agents of social reinforcement. In W. W. Hartup and N. L. Smothergill (Eds.), The young child: Reviews of research. Washington, D.C.: National Association for the Education of Young Children, 1967. Pp. 214-228.

Hartup, W. W., & Keller, E. D. Nurturance in preschool children and its relation to dependency. Child Development, 1960, 31, 681-689.

Harvey, D. J., Hunt, D. E., & Schroder, H. M. Conceptual systems and personality organizations. New York: Wiley, 1961.

Hatt, P. The concept of natural areas. American Sociological Review, 1946, 11, 423-427.

Hawkes, G. R. The child in the family. Marriage and Family Living, 1957, 19, 46-51.

Hawley, A. H. Community power and urban renewal success. American Journal of Sociology, 1963, 68, 422-431.

Hayweiser, L., Massari, D., & Meyer, W. J. Evaluating behavioral change during a six-week pre-kindergarten intervention experience. Report submitted to the Institute for Educational Development of Research supported by OEO Head Start subcontract #1410, November 1967. (Mimeographed)

Heathers, G. Emotional dependence and independence in nursery school play. Journal of Genetic Psychology, 1955, 87, 37-57.

Hebb, D. O. The organization of behavior. New York: Wiley, 1949.

Heider, F. The psychology of interpersonal relations. New York: Wiley, 1958.

Hertzig, M. E., Birch, H. G., Thomas, A., & Mendez, O. A. Class and ethnic differences in the responsiveness of preschool children to cognitive demands. Monographs of the Society for Research in Child Development, 1968, 33 (1, Serial No. 117).

Hess, R. D. Social class and ethnic influences upon socialization, in press.

Hess, R. D., & Shipman, V. C. Early experience and the socialization of cognitive modes in children. Child Development, 1965, 36, 869-886.

Hess, R. D., & Shipman, V. C. Cognitive elements in maternal behavior. Minnesota Symposium on Child Psychology. Vol. 1. Minneapolis: University of Minnesota Press, 1968. (a)

Hess, R. D., & Shipman, V. C. Maternal attitude toward the school and the role of pupil: Some social class comparisons. In A. H. Passow (Ed.), Teaching and learning in depressed areas. New York: Columbia University, Teachers College Press, 1968. (b)

Hess, R. D., Shipman, V. C., Brophy, J. E., & Bear, R. M. Cognitive environments of urban preschool children. Final Report to Children's Bureau, Grant # R-34, 1968.

Hill, K. T., & Sarason, S. B. The relation of test anxiety and defensiveness to test and school performance over the elementary school years: A further longitudinal study. Monographs of the Society for Research in Child Development, 1966, 31 (2, Serial No. 104).

Hiller, E. T. The community as a social group. American Sociological Review, 1941, 6, 189-202.

Hillery, G. A., Jr. Definitions of community: Agreas of agreement. Rural Sociology, 1955, 20, 111-123.

Hollingshead, A. B. Elmstown's youth. New York: Wiley, 1961.

Holtzman, W. H. Intelligence, cognitive style, and personality: A developmental approach. In O. G. Brim, Jr., R. S. Crutchfield, and W. H. Holtzman (Eds.), Intelligence: Perspectives 1965. New York: Harcourt, Brace & World, 1966. Pp. 1-32.

Holzman, P. S. Scanning: A principal of reality contact. Perceptual and Motor Skills, 1966, 23, 835-844.

Horn, J. L., & Cattell, R. B. Refinement and test of the theory of fluid and crystallized general intelligences. Journal of Educational Psychology, 1966, 57, 253-270.

Hotelling, H. Relations between two sets of variates. Biometrika, 1936, 28, 321-377.

Hoveland, C. I. Computer simulation of thinking. American Psychologist, 1960, 15, 687-693.

Hughes, E. W. Children's choices in individual activities in the junior school. British Journal of Educational Psychology, 1955, 25, 36-50.

Humphreys, L. G. The organization of human abilities. American Psychologist, 1962, 17(7), 475-483.

Hunt, J. McV. Intelligence and experience. New York: Ronald Press, 1961.

Hunter, F. Community power structure. Chapel Hill: University of North Carolina Press, 1953.

Hurst, J. G. A factor analysis of the Merrill-Palmer with reference to theory and test construction. Educational and Psychological Measurement, 1960, 20, 519-532.

Inhelder, B., & Piaget, J. The early growth of logic in the child. New York: Harper and Row, 1964.

Institute for Educational Development. An analytic report on a sample of full year Project Head Start programs (1966-67). Final Report to OEO, Contract No. 1410, 1968.

Izard, C. E., & Nunnally, J. C. Evaluative responses to affectively positive and negative facial photographs: Factor structure and construct validity. Educational and Psychological Measurement, 1965, 25, 1061-1071.

Jackson, D. N. Personality Research Form manual. Goshen, N.Y.: Research Psychologists Press, 1967.

Jackson, D. N., & Messick, S. Content and style in personality assessment. Psychological Bulletin, 1958, 55, 243-252.

Jackson, D. N., & Messick, S. Individual differences in social perception. British Journal of Social and Clinical Psychology, 1963, 2, 1-10.

Jackson, D. N., & Messick, S. (Eds.) Problems in Human Assessment. New York: McGraw-Hill, 1967.

Jackson, P. W. The way teaching is. In The way teaching is. A report of a seminar on teaching. A.S.C.D. and the Center for the Study of Instruction, N.E.A., Washington, D.C., 1966.

Jackson, P. W., & Messick, S. The person, the product, and the response: Conceptual problems in the assessment of creativity. Journal of Personality, 1965, 33, 309-329.

Jacobs, J. The death and life of great American cities. New York: Random House, 1961.

Jakobsen, R., & Halle, M. Fundamentals of language. The Hague, Netherlands: Moulton, 1956.

James, W. Talks to teachers on psychology. New York: Henry Holt, 1899.

Jeffrey, W. E. Discrimination of oblique lines by children. Journal of Comparative and Physiological Psychology, 1966, 62, 154-156.

Jensen, A. R. Learning in the preschool years. In W. W. Hartup and N. L. Smothergill (Eds.), The young child: Reviews of research. Washington, D.C.: National Association for the Education of Young Children, 1967. Pp. 125-135.

Johannsen, D. Perception. Annual Review of Psychology, 1967, 18, 1-40.

John, V. P. A brief survey of research on the characteristics of children from low income backgrounds. Urban Education, 1965, 1, 215-222.

Johnson, D. R., & Myklebust, H. R. Learning disabilities: Educational principles and practices. New York: Grune and Stratton, 1967.

Johnson, O. G., & Bommarito, J. W. A study of a measurement resource in child research. OEO Contract No. OEO-2452, Edwardsville, Illinois, undated.

Kagan, J. Acquisition and significance of sex typing and sex role identity. In M. L. Hoffman and L. W. Hoffman (Eds.), Review of child development research. Vol. 1. New York: Russell Sage Foundation, 1964. Pp. 137-167.

Kagan, J. Reflection-impulsivity and reading ability in primary grade children. Child Development, 1965, 36, 609-628.

Kagan, J., & Havemann, E. Psychology: An introduction. New York: Harcourt, Brace & World, 1968.

Kagan, J., & Kogan, N. Individual variation in cogntitive processes. To appear in P. H. Mussen (Ed.), Carmichael's manual of child psychology. (3rd ed.) New York: Wiley, in press. (Also Research Memorandum 68-22. Princeton, N.J.: Educational Testing Service, 1968.)

Kagan, J., & Lewis, M. Studies of attention in the human infant. Merrill-Palmer Quarterly, 1965, 11, 95-127.

Kagan, J., & Moss, H. A. Personality and social development: Family and peer influences: Family influences on personality development. Review of Educational Research, 1961, 31, 465-467.

Kagan, J., & Moss, H. A. Birth to maturity. New York: Wiley, 1962.

Kagan, J., Moss, H. A., & Sigel, I. E. Conceptual style and the use of affect labels. Merrill-Palmer Quarterly, 1960, 6, 261-278.

Kagan, J., Moss, H. A., & Sigel, I. E. Psychological significance of styles of conceptualization. In J. C. Wright and J. Kagan (Eds.), Basic cognitive process in children. Monographs of the Society for Research in Child Development, 1963, 28 (2, Serial No. 86). Pp. 73-112.

Kagan, J., Pearson, L., & Welch, L. Conceptual impulsivity and inductive reasoning. Child Development, 1966, 37, 583-594.

Kagan, J., Rosman, B. L., Kay, D., Albert, J. & Phillips, W. Information processing in the child: Significance of analytic and reflective attitudes. Psychological Monographs: General and Applied, 1964, 78 (1, Whole No. 578).

Kaiser, H. F. Image analysis. In C. Harris (Ed.), Problems in measuring change. Madison, Wisc.: University of Wisconsin, 1963.

Karp, S. A. Field dependence and overcoming embeddedness. Journal of Consulting Psychology, 1963, 27, 294-302.

Katovsky, W., Crandall, V. C., & Good, S. Parental antecedents of children's beliefs in internal-external control of reinforcement in intellectual achievement situations. Child Development, 1967, 38, 765-776.

Kaufman, H. F. Toward an interactional conception of community. Social Forces, 1959, 38, 8-17.

Kawi, A. A., & Pasamanick, B. Prenatal and parental factors in the development of childhood reading disorders. Monographs of the Society for Research in Child Development, 1959, 24 (4, Serial No. 73).

Katz, I., Henchy, T., & Allen, H. Effects of race of tester, approval-disapproval, and need on Negro children's learning. Journal of Personality and Social Psychology, 1968, 8, 38-42.

Keller, S. The social world of the urban slum child: Some early findings. The American Journal of Orthopsychiatry, 1963, 33, 823-831.

Kelly, G. A. The psychology of personal constructs. Vol. 1. New York: Norton, 1955.

Kelly, H. H. The warm-cold variable in first impressions of persons. Journal of Personality, 1950, 18, 431-439.

Kephart, N. C. The slow learner in the classroom. Columbus, Ohio: Charles E. Merrill Books, 1960.

Kidd, A. H., & Rivoire, J. L. (Eds.) Perceptual development in children. Englewood Cliffs, N.J.: Prentice-Hall, 1966.

Kintz, B. L., Delprato, D. J., Mettee, D. R., Persons, C. E., & Schappe, R. H. The experimenter effect. Psychological Bulletin, 1965, 63, 223-232.

Klapper, J. T. The effects of mass communication. New York: Macmillan, 1960.

Klaus, R. A., & Gray, S. W. The early training project for disadvantaged children: A report after five years. Monographs of the Society for Research in Child Development, 1968, 33 (4, Serial No. 120).

Klein, G. S. Need and regulation. In M. R. Jones (Ed.), Nebraska symposium on motivation. Lincoln: University of Nebraska Press, 1954. Pp. 225-274.

Klein, G. S., Gardner, R. W., & Schlesinger, H. J. Tolerance for unrealistic experiences: A study of the generality of a cognitive control. British Journal of Psychology, 1962, 53, 41-55.

Klein, G. S., & Schlesinger, H. J. Perceptual attitudes toward instability: I. Prediction of apparent movement experiences from Rorschach responses. Journal of Personality, 1951, 19, 289-302.

Klein, S. D. A developmental study of perceptual integration within and across sensory modalities. Unpublished M. A. thesis, Clark University, 1961.

Kleinmuntz, B. (Ed.) Concepts and the structure of memory. New York: Wiley, 1967.

Knobloch, H., & Pasamanick, B. Environmental factors affecting human development before and after birth. Pediatrics, 1960, 26, 210-218.

Knobloch, H., Rider, R., Harper, P., & Pasamanick, B. Neural psychiatric sequalae of prematurity. Journal of the American Medical Association, 1956, 161, 581-585.

Kofsky, E. A scalogram study of classificatory development. Child Development, 1966, 37, 191-204.

Kogan, N., & Carlson, J. A. Group risk taking under competitive and noncompetitive conditions in child and adults. Paper presented at the Biennial Meeting of the Society for Research in Child Development, New York, March 1967. (Also Research Bulletin 67-21. Princeton, N.J.: Educational Testing Service, 1967.)

Kogan, N., & Morgan, F. T. Task and motivational influences on the assessment of creative and intellective ability in children. Genetic Psychology Monographs, 1969, in press.

Kogan, N., & Wallach, M. A. Risk taking: A study in cognition and personality. New York: Holt, Rinehart & Winston, 1964.

Kohlberg, L. A cognitive-developmental analysis of children's sex-role concepts and attitudes. In E. E. Maccoby (Ed.), The development of sex differences. Stanford, Calif.: Stanford University Press, 1966. Pp. 82-173.

Konorski, J. The physiological approach to the problem of recent memory. In J. F. Delafresnaye (Ed.), Brain mechanisms and learning. Oxford: Alden Press, 1961.

Koppitz, E. M. The Bender Gestalt test for young children. New York: Grune and Stratton, 1964.

Kornhauser, W. The politics of mass society. London: Routledge & Kegan Paul, 1960.

Lashoff, J. C. Health status and services in Chicago's southside: Preliminary report on patterns of medical and health care in poverty areas of Chicago and proposed health programs for the medically indigent. Undated report. 230 pp.

Laubengayer, N. The ability of the preschool child to take the point of view of another person and the effects of training on his spatial egocentrism. Paper presented at the meeting of the Midwest Association for the Education of Young Children, Toronto, May 1965.

Laurendeau, M., & Pinard, A. Causal thinking in the child. New York: International Universities Press, 1962.

Lefcourt, H. M. Internal versus external control of reinforcement: A review. Psychological Bulletin, 1966, 65, 206-220.

Lefcourt, H. M., Lewis, L., & Silverman, I. W. Internal versus external control of reinforcement and attention in a decision making task. Journal of Personality, in press.

Lehman, H. C., & Witty, P. A. The psychology of play activities. New York: Barnes, 1927

Lenrow, P. B. Studies of sympathy. In S. S. Tomkins and C. E. Izard (Eds.), Affect, cognition, and personality. New York: Springer, 1965, Pp. 264-294.

Lesser, G. S., Fifer, G., & Clark, D. H. Mental abilities of children from different social-class and cultural groups. Monographs of the Society for Research in Child Development, 1965, 30, (4, Serial No. 102).

Levinson, B., & Reese, H. W. Patterns of discrimination learning set in preschool children, fifth-graders, college freshmen, and the aged. Monographs of the Society for Research in Child Development, 1967, 32, (7, Serial No. 115).

Levitt, E. E. The psychology of anxiety. Indianapolis: Bobbs-Merrill, 1967.

Lewin, K. A dynamic theory of personality. New York: McGraw-Hill, 1935.

Lewin, K. Field theory in social science. New York: Harper and Row, 1951.

Lewis, M., & Goldberg, S. The acquisition and violation of expectancy: An experimental paradigm. Journal of Experimental Child Psychology, in press. (a)

Lewis, M., & Goldberg, S. Perceptual and cognitive development in infancy: A generalized expectancy model as a function of the mother-infant interaction. Merrill-Palmer Quarterly, in press. (b)

Lewis, M., Kagan, J., & Kalafat, J. Patterns of fixation in infants. Child Development, 1966, 37, 331-341.

Lewis, M., Rausch, M., Goldberg, S., & Dodd, C. Error, response time and IQ: Sex differences in cognitive style of preschool children. Perceptual and Motor Skills, 1968, 26, 563-568.

Lieberman, J. N. Playfulness and divergent thinking: An investigation of their relationship at the kindergarten level. Journal of Genetic Psychology, 1965, 107, 219-224.

Lieberson, S. Ethnic patterns in American cities. New York: The Free Press of Glencoe, 1963.

Likert, R. A. A technique for the measurement of attitudes. Archives of Psychology, 1932, No. 140.

Litwak, E. Occupational mobility and family cohesion. American Sociological Review, 1960, 25, 9-21.

Luria, A. R. Human brain and psychological processes. New York: Harper and Row, 1966.

Luria, A. R., & Yudovich, I. Speech and the development of the mental processes in the child. London: Staples Press, 1959.

Lutzky, H. C., & Schmeidler, G. R. Perceptual leveling in institutional and other children. Journal of Genetic Psychology, 1963, 103, 45-51.

Lynd, R. S., & Lynd, H. M. Middletown, a study in American culture. New York: Harcourt, Brace, 1929.

Lynn, R. Attention, arousal, and the orientation reaction. London: Pergamon Press, 1966.

Maccoby, E. E. Why do children watch television? Public Opinion Quarterly, 1954, 18, 239-244.

Maccoby, E. E. (Ed.) The development of sex differences. Stanford, Calif.: Stanford University Press, 1966.

Maccoby, E. E. What copying requires. Paper presented at the meetings of the American Psychological Association, Washington, D.C. September 1967.

Maccoby, E. E., & Bee, H. Some speculations concerning the lag between perceiving and performing. Child Development, 1965, 36(2), 367-378.

Maccoby, E. E., Dowley, E. M., Hagen, J. W., & Degerman, R. Activity level and intellectual functioning in normal preschool children. Child Development, 1965, 36, 761-770.

Maccoby, E. E., & Hagen, J. W. Effects of distraction upon central versus incidental recall: Developmental trends. Journal of Experimental Child Psychology, 1965, 2(3), 280-289.

Maccoby, E. E., & Konrad, K. W. Age trends in selective listening. Journal of Experimental Child Psychology, 1966, 3, 113-122.

Maccoby, E. E., & Konrad, K. W. The effect of preparatory set on selective listening: Developmental trends. Monographs of the Society for Research in Child Development, 1967, 32 (4, Serial No. 112).

Maccoby, E. E., & Masters, J. C. Attachment and dependency. In P. Mussen (Ed.), Carmichael's manual of child psychology. (3rd ed.) New York: Wiley, in press.

Markey, F. V. Imaginative behavior in preschool children. New York: Bureau of Publications, Teachers College, Columbia University, 1935.

Mayer, M. The schools. New York: Harper & Brothers, 1961.

McCartin, Sister Rose Amata, & Meyers, C. E. An exploration of six semantic factors at first grade. Multivariate Behavioral Research, 1966, 1, 74-94.

McClelland, D., Atkinson, J., Clark, R., & Lowell, E. The achievement motive. New York: Appleton-Century-Crofts, 1953.

McGhee, P. E., & Crandall, V. C. Beliefs internal-external control of reinforcements and academic performance. Child Development, 1968, 39, 91-102.

McGuigan, F. J. The experimenter: A neglected stimulus object. Psychological Bulletin, 1963, 60, 421-428.

McKenzie, R. D. The scope of human ecology. Publications of the American Sociological Society, 1926, 20, 141-154.

McNemar, Q. Lost: Our intelligence? Why? American Psychologist, 1964, 19, 871-882.

Medley, D. M., Impelletteri, J. T., & Smith, L. H. Coding teachers' verbal behavior in the classroom: A manual for users of OScAR 4V. New York: Division of Teacher Education of the City University of New York, 1966.

Medley, D. M., & Mitzel, H. E. A technique for measuring classroom behavior. Journal of Educational Psychology, 1958, 49, 86-92.

Medley, D. M., & Mitzel, H. E. Measuring classroom behavior by systematic observation. In N. L. Gage (Ed.), A handbook of research in teaching. Chicago: Rand, McNally, 1963.

Medley, D. M., Schluck, C. G., & Ames, N. P. Assessing the learning environment in the classroom. A manual for users of OScAR 5V. Research Memorandum 68-9. Princeton, N.J.: Educational Testing Service, 1968.

Mednick, S. A. The associative basis of the creative process. Psychological Review. 1962, 69, 220-232.

Mednick, S. A., & Shaffer, J. P. B. Mother's retrospective reports in child rearing research. American Journal of Orthopsychiatry, 1963, 33, 457-461.

Melton, A. W., & Von Lackum, W. J. Retroactive and proactive inhibition in retention: Evidence for a two-factor theory of retroactive inhibition. American Journal of Psychology, 1941, 54, 157-173.

Melton, R. S., Charlesworth, R., Tanaka, M. N., Rothenberg, B. B., Pike, L. W., Bussis, A. M., & Gollin, E. S. Cognitive growth in preschool children. Paper presented at the meetings of the American Educational Research Association, Chicago, February 1968. (Also ETS Research Memorandum 68-13. Princeton, N.J.: Educational Testing Service, 1968.)

Merrifield, P. R., Guilford, J. P., Christensen, P. R., & Frick, J. W. The role of intellectual factors in problem solving. Psychological Monographs: General and Applied, 1962, 76, No. 10.

Messick, S. Personality structure. In P. Farnsworth, O. McNemar and Q. McNemar (Eds.), Annual Review of Psychology, 1961, 12, 93-128.

Messick, S. The criterion problem in the evaluation of instruction: Assessing possible, not just intended outcomes. In Disadvantaged children and their first school experiences. Interim Report, OEO Contract No. 4206, Educational Testing Service, Princeton, N.J., February 26, 1968. (a)

Messick, S. Response sets. In D. L. Sills (Ed.), International encyclopedia of the social sciences. New York: Macmillan & Free Press, 1968, 13, 492-496. (b)

Messick, S., & Damarin, F. Cognitive styles and memory for faces. Journal of Abnormal and Social Psychology, 1964, 69, 313-318.

Messick, S., & French, J. W. Dimensions of closure in cognition and personality. Paper presented at the meetings of the American Psychological Association, Washington, D.C., September 1967.

Messick, S., & Fritzky, F. J. Dimensions of analytic attitude in cognition and personality. Journal of Personality, 1963, 31, 346-370.

Messick, S., & Kogan, N. Differentiation and compartmentalization in object-sorting measures of categorizing style. Perceptual and Motor Skills, 1963, 16, 47-51.

Messick, S., & Kogan, N. Personality consistencies in judgment: Dimensions of role constructs. Multivariate Behavioral Research, 1966, 1, 165-175.

Meyers, C. E., Dingman, H. F., Orpet, R. E., Sitkei, E. G., & Watts, C. A. Four ability-factor hypotheses at three preliterate levels in normal and retarded children. Monographs of the Society for Research in Child Development, 1964, 29(5).

Meyers, C. E., Orpet, R. E., Atwell, A. A., & Dingman, H. F. Primary abilities at mental age six. Monographs of the Society for Research in Child Development, 1962, 27 (Whole No. 82).

Miller, D. R., & Swanson, G. E. Inner conflict and defense. New York: Schocken Books, 1966.

Miller, G. A., Galanter, E., & Pribram, K. Plans and the structure of behavior. New York: Holt, Rinehart & Winston, 1960.

Miller, J. O. Diffusion of intervention effects in disadvantaged families. Paper presented at the meetings of the American Psychological Association, San Francisco, September 1968.

Milner, E. A study of the relationships between reading readiness in grade one school children and patterns of parent-child interaction. Child Development, 1951, 22, 95-112.

Minuchin, P., & Biber, B. A child development approach to language in the preschool disavantaged child. Paper presented at the meetings of the Society for Research in Child Development, April 1967.

Minuchin, S., Montalvo, B., Guerney, B. G., Rosman, B. L., & Schumer, F. Families of the slums: An exploration of their structure and treatment. New York: Basic Books, 1967.

Mischel, W. Father absence and delay of gratification: Cross-cultural compraisons. Journal of Abnormal and Social Psychology, 1961, 63, 116-124.

Mischel, W. Theory and research on the antecedents of self-imposed delay of reward. In B. A. Maher (Ed.), Progress in experimental personality research. Vol. 3. New York: Academic Press, 1966. Pp. 85-132.

Mischel, W. Personality and assessment. New York: Wiley, 1968.

Mitchell, J. C., Jr. A comparison of the factorial structure cognitive function for a high and low status group. Journal of Educational Psychology, 1956, 47, 397-414.

Moore, S. G. Correlates of peer acceptance in nursery school children. In W. W. Hartup and N. L. Smothergill (Eds.), The young child: Reviews of research. Washington, D.C.: National Association for the Education of Young Children, 1967. Pp. 229-247.

Moriarty, A. Coping pattern of preschool children in response to intelligence test demands. Genetic Psychology Monographs, 1961, 64, 3-127.

Morton, R. Social theory and social structure. Glencoe, Ill.: The Free Press, 1961.

Mouly, A. J. Psychology for effective teaching. (2nd ed.) New York: Holt, Rinehart & Winston, 1968.

Moustakas, C. E., Sigel, I. E., & Schalock, H. D. An objective method for the measurement and analysis of child-adult interaction. Child Development, 1956, 27, 109-134.

Münsterberg, H. On the witness stand: Essays on psychology and crime. New York: Clark Boardman, 1908.

Murphy, L. B. The widening world of childhood, paths toward mastery. New York: Basic Books, 1962.

Murphy, L. B. Factors in continuity and change in the development of adaptational style in children. Vita Humana, 1964, 7, 96-114.

Murray, H. A. Explorations in personality. New York: Oxford University Press, 1938.

Nisbit, R. A. Community and power (formerly The quest for community). New York: Oxford University Press (Galaxy Book), 1962.

Olim, E. G., Hess, R. D., & Shipman, V. C. Maternal language styles and their implications for children's cognitive development. Paper presented at the meetings of the American Psychological Association, Symposium on the Effect of Maternal Behavior on Cognitive Development and Impulsivity, Chicago, September 1965.

Olim, E. G., Hess, R. D., & Shipman, V. C. Role of mother's language styles in mediating their preschool children's cognitive development. School Review, 1967, 75, 414-424.

Pankove, E., & Kogan, N. Creative ability and risk taking in elementary school children. Journal of Personality, 1968, 36, 420-439.

Park, R. Human ecology. American Journal of Sociology, 1936, 42, 1-15.

Pasamanick, B., & Knobloch, H. The contribution of organic factors to school retardation in Negro children. Journal of Negro Education, 1958, 27, 4-9.

Peck, R. F., & Richek, H. G. Personality and social development: Family influences. Review of Educational Research, 1964, 34, 574-587.

Pedersen, F. A., & Wender, P. H. Early social correlates of cognitive functioning in six-year-old boys. Child Development, 1968, 39, 185-193.

Peel, E. A. Experimental examination of some of Piaget's schemata concerning children's perception and thinking, and a discussion of their educational significance. British Journal of Educational Psychology, 1959, 29, 89-103.

Pelligrin, R. J., & Coates, C. H. Absentee-owned corporations and community power structure. American Journal of Sociology, 1956, 61, 413-419.

Peterson, D. R. The age generality of personality factors derived from ratings. Educational and Psychological Measurement, 1960, 20, 461-474.

Pettigrew, T. F. The measurement and correlates of category width as a cognitive variable. Journal of Personality, 1958, 26, 532-544.

Pfautz, H. W., & Duncan, O. D. A critical analysis of Werner's work in community stratification. American Sociological Review, 1950, 15, 205-215.

Piaget, J. Judgment and reasoning in the child. New York: Harcourt, Brace, 1928.

Piaget, J. The child's conception of the world. New York: Harcourt, Brace, 1929.

Piaget, J. The child's conception of physical causality. London: Kegan Paul, 1930.

Piaget, J. The psychology of intelligence. New York: Harcourt, Brace, 1950.

Piaget, J. The child's conception of number. New York: Humanities, 1952.

Piaget, J. Logic and psychology. New York: Basic Books, 1957.

Piaget, J. Comments (on Vygotsky's critical remarks concerning The language and thought of the child and judgment and reasoning in the child). Boston: M.I.T. Press, 1962.

Piaget, J. Psychology of intelligence. Paterson, N.J.: Littlefield, Adams, 1963.

Piaget, J. Language and thought of the child. Cleveland: Meridian, 1966.

Piaget, J. Six psychological studies. New York: Random House, 1967.

Piaget, J. On the development of memory and identity. Barre, Mass.: Clark University Press, 1968.

Piaget, J., & Inhelder, B. Le développement des quantités chez l'enfant. Neuchâtel: Delachauz et Niestlé, 1941.

Piaget, J., & Inhelder, B. The child's conception of space. London: Routledge & Kegan Paul, 1956.

Piaget, J., & Inhelder, B. The early growth of logic in the child. New York: Harper and Row, 1964.

Pick, A. Improvement in visual discrimination of letter-like forms. In H. Levin, E. Gibson, A., Baldwin, J. Gibson, C. Hoskett, H. Ricciuti, and G. Suci (Eds.), A basic research program on reading. Cooperative Research Project No. 639. Ithaca, N.Y.: Cornell University, 1963.

Pick, H. L. Perception in Soviet psychology. Psychological Bulletin, 1964, 62, 21-35.

Pine, F., & Holt, R. R. Creativity and primary process: A study of adaptive regression. Journal of Abnormal and Social Psychology, 1960, 61, 370-379.

Porter, P. J. The final report: Evaluation of Head Start Educational Program in Cambridge, Massachusetts, Harvard University Medical School, December 1965.

Potter, M. C., & Levy, E. I. Spatial enumeration without counting. Child Development, 1968, 39, 265-272.

Project Head Start-Summer 1966, Evaluation Report. Donald J. Peters (Director), San Mateo County, California.

Quereshi, M. Y. Intelligence test scores as a function of sex of experimenter and sex of subject. Journal of Psychology, 1968, 69, 277-284.

Rainwater, L. Crucible of identity: The Negro lower-class family. Daedalus, 1966, 95, 172-211.

Rand, G., Wapner, W., Werner, H., & McFarland, J. H. Age differences in performance on the Stroop Color-Word Test. Journal of Personality, 1963, 31, 534-558.

Raph, J. Language development in socially disadvantaged children. Review of Educational Research, 1965, 35, 389-400.

Reed, H. B. C., Jr., Reitan, R. M., & Kløve, H. Influence of cerebral lesions on psychological test performance of older children. Journal of Consulting Psychology, 1965, 29(3), 247-251.

Reiss, A. J., Jr. The sociological study of communities. Rural Sociology, 1959, 24, 118-130.

Reitman, W. R. Cognition and thought. New York: Wiley, 1965

Rhine, R. J. A concept-formation approach to attitude acquisition. Psychological Review, 1958, 65, 362-370.

Robbins, L. C. The accuracy of parental recall of aspects of child development and of child rearing practices. Journal of Abnormal and Social Psychology, 1963, 66, 261-270.

Roeper, A., & Sigel, I. Finding the clue to children's thought processes. Young Children, September 1966, 335-349.

Rokeach, M. The open and closed mind. New York: Basic Books, 1960.

Rosen, B., & D'Andrade, R. The psychological origins of achievement motivation. Sociometry, 1959, 22, 185-218.

Rosenberg, M. J., & Hovland, C. I. Cognitive, affective, and behavioral components of attitudes. In C. I. Hovland and M. J. Rosenberg (Eds.), Attitude organization and change. New Haven: Yale University Press, 1960.

Rosenhan, D., & Messick, S. Affect and expectation. Journal of Personality and Social Psychology, 1966, 3, 38-44.

Rosenthal, E. Acculturation with assimilation? American Journal of Sociology, 1960, 66, 275-288.

Rosenthal, R. Clever Hans: A case study of scientific method. Introduction to O. Pfungst, Clever Hans: (the horse of Mr. Von Osten). New York: Hold, Rinehart and Winston, 1965. Pp. IX-XIII.

Rosenthal, R. The influences of expectation on learning. Paper presented at A.S.C.D.-E.K.N.E. conference on The unstudied curriculum: Its impact on children, Washington, D.C., January 1968.

Rosenthal, R., & Jacobson, L. Pygmalion in the classroom. New York: Holt, Rinehart and Winston, 1968.

Ross, H. L. The local community: A survey approach. American Sociological Review, 1962, 27, 75-84.

Rossi, P. H. Community decision making. Administrators Science Quarterly, 1957, 1, 415-433.

Rossman, J. The psychology of the inventor. Washington, D.C.: Inventors Publishing Co., 1931. (Cited in J. P. Guilford, The nature of human intelligence. New York: McGraw-Hill, 1967.)

Rothenberg, B. B., & Courtney, R. G. Conservation of number in very young children. Research Bulletin 68-51. Princeton, N.J.: Educational Testing Service, 1968.

Rotter, J. B. Generalized expectancies for internal versus external control of reinforcement. Psychological Monographs: General and Applied, 1966, 80, (1, Whole No. 609).

Rotter, J. B., Seaman, M. R., & Liverant, S. Internal versus external control of reinforcement: A major variable in behavior theory. In N. F. Washburne (Ed.), Decisions, values, and groups, Vol. 2. New York: Pergamon Press, 1962.

Rubenstein, J. Maternal attentiveness and subsequent exploratory behavior. Child Development, 1967, 38, 1089-1100.

Rudel, R. G., & Teuber, H. L. Discrimination of direction of line in children. Journal of Comparative and Physiological Psychology, 1963, 56, 892-898.

Ruebush, B. K. Anxiety. In H. W. Stevenson (Ed.), Child Psychology. The 62nd Yearbook of the National Society for the Study of Education. Part 1. Chicago: University of Chicago Press, 1963. Pp. 460-516.

Russell, D. Children's thinking. Boston: Ginn, 1956.

Russell, J. E. Change and challenge in American education. Boston: Houghton Mifflin, 1965.

Ryans, D. G. Characteristics of teachers. Washington, D.C.: American Council on Education, 1960.

Sanderson, D. Locating the rural community. Ithaca: New York State College of Agriculture, 1939.

Santostefano, S. A developmental study of the cognitive control "leveling-sharpening." Merrill-Palmer Quarterly, 1964, 10, 343-360.

Sapir, E. Language. In Encyclopedia of the Social Sciences, 1933, 9, 155-169. New York: Macmillan.

Sarbin, T. R., Taft, F., & Bailey, D. Clinical inference and cognitive theory. New York: Holt, Rinehart and Winston, 1960.

Sawrey, J. M., & Telford, C. W. Educational psychology. Boston: Allyn & Bacon, 1964.

Schachter, S. The psychology of affiliation. Stanford, Calif.: Stanford University Press, 1959.

Schaefer, E. S. A circumplex model for maternal behavior. Journal of Abnormal and Social Psychology, 1959, 59, 226-235.

Schaefer, E. S. Converging conceptual models for maternal behavior and for child behavior. In J. C. Glidewell (Ed.), Parental attitudes and child behavior. Springfield, Ill.: Charles C. Thomas, 1961. Pp. 124-146.

Schlesinger, H. J. Cognitive attitudes in relation to susceptibility to interference. Journal of Personality, 1954, 22, 354-374.

Schroder, H. M., Driver, M. J., & Streufert, S. Human information processing. New York: Holt, Rinehart and Winston, 1967.

Schueler, N., Gold, M. J., & Mitzel, H. E. The use of television for improving teachers training and for improving measures of student teaching performance. Phase I: Improvement of student teaching. Hunter College of the City University of New York, United States Office of Education Grant No. 730035, 1962.

Scott, W. A. Conceptualizing and measuring structural properties of cognition. In O. J. Harvey (Ed.), Motivation and social interaction. New York: Ronald Press, 1963.

Sears, P. S. Correlates of need achievement and need affiliation and classroom management, self-cocept, achievement and creativity. Unpublished manuscript, Laboratory of Human Development, Stanford University, 1962.

Sears, R. R. Dependency motivation. In M. R. Jones (Ed.), Nebraska symposium on motivation. Lincoln: University of Nebraska Press, 1963. Pp. 25-64.

Sears, R. R., Maccoby, E. E., & Levin, H. Patterns of child rearing. Evanston, Ill.: Row, Peterson & Company, 1957.

Secord, P. F., & Backman, C. W. Social Psychology. New York: McGraw Hill, 1964.

Sexton, P. Education and income, inequalities of education in our public schools. New York: Viking Press, 1961.

Shapiro, D. Neurotic styles. New York: Basic Books, 1965.

Shaycroft, Marion F. The high school years: Growth in cognitive skills. Pittsburgh: Project Talent Office, 1967.

Sherrington, C. Man on his nature. Cambridge, England: Cambridge University Press, 1951.

Shore, R. E. Parental determinants of boys' internal-external controls. Unpublished doctoral dissertation, Syracuse University, 1967.

Siegel, A., & Stevenson, H. Incidental learning: A developmental study. Child Development, 1966, 37, 811-817.

Sigel, I. E. The attainment of concepts. In M. L. Hoffman and L. W. Hoffman (Eds.), Review of child development research. Vol. 1. New York: Russell Sage Foundation, 1964. Pp. 209-248.

Sigel, I. E., Jarman, P., & Hanesian, H. Styles of categorization and their intellectual and personality correlates with young children. Human Development, 1967, 10, 1-17.

Sigel, I. E., & McBane, B. Cognitive competence and level of symbolization among five-year-old children. Paper presented at the meetings of the American Psychological Association, New York City, September 1966. (Mimeographed)

Sigel, I. E., & Olmsted, P. Modification of classificatory competence and level of representation among lower-class Negro kindergarten children. Report submitted to the Institute for Educational Development on research supported by OEO Head Start Subcontract No. 1410, November 1967. (Mimeographed)

Sigel, I. E., Saltz, E., & Roskind, W. Variables determining concept conservation in children. Journal of Experimental Psychology, 1967, 74, 471-475.

Signell, K. A. Cognitive complexity in person perception and nation perception: A developmental approach. Journal of Personality, 1966, 34, 517-537.

Silver, A., & Hagin, R. Specific reading disability: An approach to diagnosis and treatment. Journal of Special Education, 1967, 1(2), 109-118.

Simpson, R. L. Sociology of the community: Current status and prospects. Umpublished paper, 1964.

Skinner, B. F. The technology of teaching. New York: Appleton-Century-Crofts, 1968.

Slaughter, D. T. Maternal antecedents of academic achievement behavior in Negro Head Start children. Unpublished doctoral dissertation, University of Chicago, 1968.

Smith, B. O., & Meux, M. A study of the logic of teaching. Bureau of Educational Research, College of Education, University of Illinois, Project No. 258(7257), 1962.

Smith, B. O., Meux, M., Coombs, J., Nuthall, G., & Precians, R. A study of the strategies of teaching. Bureau of Educational Research, College of Education, University of Illinois, Project No. 1640, 1967.

Smith, J., Form, W. H., & Stone, G. P. Local intimacy in a middle-sized city. American Journal of Sociology, 1954, 60, 276-284.

Smock, D. D., & Holt, B. G. Children's reactions to novelty: An experimental study of "curiosity motivation." Child Development, 1962, 33, 631-642.

Solley, C. M., & Murphy, G. Development of the perceptual world. New York: Basic Books, 1960.

Solomon, D., Parelius, R. J., & Busse, T. V. Dimensions of achievement-related behavior among lower-class Negro parents. Unpublished manuscript, Institute for Juvenile Research, Chicago, 1967. (Mimeographed)

Spearman, C. The abilities of man. New York: Macmillan, 1927.

Spire, M. E. The acculturation of American ethnic groups. American Anthropologist, 1955, 57, 1240-1252.

Stake, R. E. Learning parameters, aptitudes, and achievements. Psychometric Monographs, No. 9. Richmond, Va.: William Byrd Press, 1961.

Stendler, C. B. (Ed.) Readings in child behavior and development. New York: Harcourt, Brace & World, 1964.

Stern, C., & Keislar, E. Effects of dialect and instructional procedures on children's oral language and concept acquisition. Los Angeles: University of California, 1968. (Mimeographed)

Stevenson, H. W., Hale, G. A., Klein, R. E., & Miller, L. K. Interrelations and correlates in children's learning and problem solving. Monographs of the Society for Research in Child Development, 1968, 33 (7, Serial No. 123).

Stodolsky, S. Maternal behavior and language and concept formation in Negro pre-school children: An inquiry into process. Unpublished doctoral dissertation, University of Chicago, 1965.

Stott, L. H. Personality at age four. Child Development, 1962, 33, 287-311.

Stott, L. H., & Ball, R. S. Infant and preschool mental tests: Review and Evaluation. Monographs of the Society for Research in Child Development, 1965, 30 (31, Serial No. 101).

Strauss, A. A., & Lehtinen, L. E. Psychopathology and education of the brain-damaged child. New York: Grune and Stratton, 1947.

Sussman, M. B. (Ed.) Community structure and analysis. New York: Crowell, 1959. Pp. 93-112.

Sutton, W. A., & Kolaja, J. Elements of community action. Social Forces, 1960, 38, 325-331.

Sutton-Smith, B., & Rosenberg, B. G. Sixty years of historical change in the game preferences of American children and youth. Journal of American Folklore, 1961, 74 (Serial No. 291). Pp. 17-46.

Taft, R. Some characteristics of good judges of others. British Journal of Psychology, 1956, 47, 19-29.

Tagiuri, R. Person perception. In G. Lindzey and E. Aaronson (Eds.), Handbook of social psychology. (2nd ed.) Cambridge, Mass.: Addison-Wesley, 1969, in press.

Tanaka, M. N. Preliminary analysis of Human-Animal-Thing (HAT) Task. Unpublished manuscript.

Taylor, C. W., Smith, W. R., & Ghiselin, B. Analysis of multiple criteria of creativity and productivity of scientists. In C. Taylor (Ed.), The 1959 University of Utah research conference on the identification of creative scientific talent. Salt Lake City: University of Utah Press, 1959. Pp. 5-28.

Terman, L. M., & Tyler, L. Psychology of sex differences. In L. Carmichael (Ed.), Manual of child psychology. New York: Wiley, 1954. Pp. 1064-1114.

Theodorson, G. A. (Ed.) Studies in human ecology. New York: Harper & Row, 1961.

Thistlethwaite, D. Attitude and structure as factors in the distortion of reasoning. Journal of Abnormal and Social Psychology, 1950, 45, 442-458.

Thomas, A., Chess, S., & Birch, H. G. Temperament and behavior disorders in children. New York: New York University Press, 1968.

Thorndike, E. L. Intelligence and its uses. Harper's Magazine, 1920, 140, 227-235.

Thorndike, R. L. Some methodological issues in the study of creativity. In Proceedings of the 1962 invitational conference on testing problems. Princeton, N.J.: Educational Testing Service, 1963, Pp. 40-54.

Thurstone, L. L. The stimulus-response fallacy in psychology. Psychological Review, 1923, 30, 354-369.

Thurstone, L. L. The nature of intelligence. New York: Harcourt, Brace & Company, 1926.

Thurstone, L. L. Attitudes can be measured. American Journal of Sociology, 1928, 33, 529-554.

Thurstone, L. L. Primary mental abilities. Psychometric Monographs, No. 1. Chicago: University of Chicago Press, 1938.

Thurstone, L. L. A factorial study of perception. Psychometric Monographs, No. 4. Chicago: University of Chicago Press, 1944.

Tilly, C. Occupational rank and grade of residence in a metropolis. American Journal of Sociology, 1961, 67, 323-330.

Tomkins, S. S. Affect, imagery, consciousness. Vol. 1. The positive affects. New York: Springer, 1962.

Tomkins, S. S. Affect, imagery, consciousness. Vol. 2. The negative affects. New York: Springer, 1963.

Tomkins, S. S., & McCarter, R. What and where are the primary affects? Some evidence for a theory. Perceptual and Motor Skills, 1964, 18, 119-158.

Tomkins, S. S., & Messick, S. Computer simulation of personality. New York: Wiley, 1963.

Torrance, E. P. Guiding creative talent. Englewood Cliffs, N.J.: Prentice-Hall, 1962.

Torrance, E. P. Rewarding creative behavior: Experiments in classroom creativity. Englewood Cliffs, N.J.: Prentice-Hall, 1965.

Trabasso, T., & Bower, G. Attention in learning. New York: Wiley, 1968.

Travers, R. M. W. Essentials of learning. (2nd ed.) New York: Macmillan, 1967. (a)

Travers, R. M. W. Perceptual learning. Review of Educational Research, 1967, 37(5), 599. (b)

Tripodi, T., & Bieri, J. Cognitive complexity, perceived conflict, and certainty. Journal of Personality, 1966, 34, 144-153.

Trow, W. C. Psychology in teaching and learning. Cambridge, Mass.: Houghton Mifflin, 1960.

Van Arsdol, M., Camilleri, S., & Schmid, C. F. An investigation into the generality of the Shovky social area indices. American Sociological Review, 1958, 23, 277-284.

Vannoy, J. S. Generality of cognitive complexity-simplicity as a personality construct. Journal of Personality and Social Psychology, 1965, 2, 385-396.

Vernon, P. E. The structure of human abilities. New York: Wiley, 1950.

Vygotsky, L. S. Thought and language. (Ed. and translated by E. Hanfmann and G. Vakar.) Cambridge, Mass.: M.I.T. Press, 1962.

Wakin, E., & Lettau, E. At the edge of Harlem. New York City: William Morrow, 1965.

Walker, R. N. Some temperament traits in children as viewed by their peers, their teachers, and themselves. Monographs of the Society for Research in Child Development, 1967, 32 (6, Serial No. 114)

Wallach, M. A. Commentary: Activie-analytical vs. passive-global cognitive functioning. In S. Messick and J. Ross (Eds.), Measurement in personality and cognition. New York: Wiley, 1962. Pp. 199-215.

Wallach, M. A. Creativity. In P. H. Mussen (Ed.), Carmichael's manual of child psychology. (3rd ed.) New York: Wiley, in press.

Wallach, M. A., & Caron, A. J. Attribute criteriality and sex-linked conservatism as determinants of psychological similarity. Journal of Abnormal and Social Psychology, 1959, 59, 43-50.

Wallach, M. A., & Kogan, N. Modes of thinking in young children: A study of the creativity-intelligence distinction. New York: Holt, Rinehart and Winston, 1965.

Wallach, M. A., & Wing, C. W., Jr. Ideas and accomplishments: On validating the creativity-intelligence distinction. New York: Holt, Rinehart and Winston, in press.

Wallas, G. The art of thought. New York: Harcourt, Brace, 1926.

Waller, W. The sociology of teaching. New York: Wiley, 1965. (First published, 1932)

Walters, R. H., & Ray, E. Anxiety, socialization, and reinforcer effectiveness. Journal of Personality, 1960, 28, 358-367.

Ward, L. B. Reminiscence and rote learning. Psychological Monographs: General and Applied, 1937, 49 (4, Whole No. 220).

Ward, W. C. Creativity in young children. Child Development, 1968, 39,

Ward, W. C. Reflection-impulsivity in kindergarten children. Child Development, 1968, 39, 867-874. (b)

Ward, W. C. Creativity and environmental cues in nursery school children. Developmental Psychology, in press.

Warner, W. L., & Lunt, P. S. The social life of a modern community. New Haven: Yale University Press, 1941.

Waters, E., & Crandall, V. J. Social class and observed maternal behavior. Child Development, 1964, 35, 1021-1032.

Wechsler, D. Wechsler Preschool and Primary Test of Intelligence, manual. New York: The Psychological Corporation, 1967.

Weir, M. W. Developmental changes in problem-solving strategies. Psychological Review, 1964, 71, 473-490.

Weir, M. W. Children's behavior in probabilistic tasks. In W. W. Hartup and N. L. Smothergill (Eds.), The young child: Reviews of research. Washington, D.C.: National Association for the Education of Young Children, 1967. Pp. 136-154.

Werner, H. Comparative psychology of mental development. (Rev. ed.) New York: International Universities Press, 1957. (a)

Werner, H. The concept of development from a comparative and organismic point of view. In D. B. Harris (Ed.), The concept of development: An issue in the study of human behavior. Minneapolis: University of Minnesota Press, 1957. (b)

Wertheimer, M. Productive thinking. New York: Harper & Brothers, 1945.

Wetzel, N. C. Assessing the physical condition of children. Journal of Pediatrics, 1943, 22, 82-110; 208-225; 329-361.

Wheeler, L., Burke, C. J., & Reitan, R. An application of discriminant functions to the problem of predicting brain damage using behavioral variables. Perceptual and Motor Skills, 1963, 16, 417-440.

Wheeler, L., & Reitan, R. Discriminant functions applied to the problem of predicting cerebral damage from behavioral tests: A cross-validation study. Perceptual and Motor Skills, 1963, 16, 681-701.

White, B. Personal communication, 1968.

White, R. W. Motivation reconsidered: The concept of competence. Psychological Review, 1959, 66, 297-333.

Whorf, B. L. Science and linguistics. In J. B. Carroll (Ed.), Language thought, and reality; selected readings. Cambridge, Mass.: M.I.T. Press, 1956.

Withall, J. The development of a technique for the measurement of social-emotional climate in classrooms. Journal of Experimental Education, 1949, 17, 347-361.

Witkin, H. A., Dyk, R. B., Faterson, H. F., Goodenough, D. R., & Karp, S. A. Psychological differentiation. New York: Wiley, 1962.

Witkin, H. A., Goodenough, D. R., & Karp, S. A. Stability of cognitive style from childhood to young adulthood. Journal of Personality and Social Psychology, 1967, 7, 291-300.

Witkin, H. A., Lewis, H. B., Hertzman, M., Machover, K., Meissner, P. B., & Wapner, S. Personality through perception. New York: Harpers, 1954.

Witkin, H. A., Lewis, H. B., & Weil, E. Affective reactions and patient-therapist interactions among more differentiated and less differentiated patients early in therapy. Journal of Nervous and Mental Disease, 1968, 146, 193-208.

Witty, P. A study of the interests of children and youth. Washington, D.C.: Office of Education, Department of Health, Education and Welfare, 1960. (a)

Witty, P., and associates. Studies of children's interests--a brief summary. Elementary English, November 1960. (b)

Wohlwill, J. Developmental studies of perception. Psychological Bulletin, 1960, 57, 249. (a)

Wohlwill, J. A study of the development of the number concept by scalogram analysis. Journal of Genetic Psychology, 1960, 97, 345-377. (b)

Wohlwill, J. Perceptual learning. Annual Review of Psychology, 1966, 17, 201-232.

Wohlwill, J. Personal communication, 1968.

Wolf, R. M. The identification and measurement of environmental process variables related to intelligence. Unpublished doctoral dissertation, University of Chicago, 1964.

Woodring, P. Let's talk sense about our schools. New York: McGraw-Hill, 1953.

Woodrow, H. Effect of type of training upon transference. Journal of Educational Psychology, 1927, 18, 159-172.

Yarrow, L. J. Maternal deprivation: Toward an empriical and conceptual reevaluation. Psychological Bulletin, 1961, 58, 459-490.

Yarrow, L. J. Separation from parents during early childhood. In M. L. Hoffman and L. W. Hoffman (Eds.), Review of child development research. Vol. 1. New York: Russell Sage Foundation, 1964. Pp. 89-136.

Yarrow, M. R. Problems of methods in parent-child research. Child Development, 1963, 34, 215-226.

Yarrow, M. R., Campbell, J. D., & Burton, R. V. Child rearing: An inquiry into research and methods. San Francisco: Jossey-Bass, 1968.

Zaporoxhets, A. V. The development of perception in the preschool child. Monographs of the Society for Research in Child Development, 1965, 30, (2, Serial No. 100). Pp. 82-111.

Zeaman, D., & House, B. J. The relation of IQ and learning. In R. M. Gagne (Ed.), Learning and individual differences. Columbus, Ohio: Charles E. Merrill Books, Inc., 1967. Pp. 192-212.

Zigler, E. F. Learning, development and social class in the socialization process. In M. H. Marx (Ed.), Learning: Interaction. New York: Macmillan, 1968.

Zigler, E. F., & Butterfield, E. C. Motivational factors and IQ changes in culturally deprived children attending nursery school. Child Development, 1968, 39, 1-14.

Zwicky, F. Morphological analysis. Berlin: Springer, 1957.

APPENDIX a

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