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HEAD START EVALUATION AND RESEARCH CENTER, TEACHERS COLLEGE, COLUMBIA UNIVERSITY. ANNUAL REPORT (1ST), SEPTEMBER 1966-AUGUST 1967. (TITLE SUPPLIED).

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COMPLETE EVALUATION DATA WERE GATHERED ON 162 CHILDREN IN 23 CLASSES IN NINE HEAD START CENTERS. FIVE AREAS EXPLORED WERE--(1) ITEM ANALYSIS OF EVALUATION TESTS--STANFORD-BINET AND THE CALDWELL-SOULE PRESCHOOL INVENTORY, (2) COMPARISON OF AGE-MATCHED GROUPS--43 MATCHED PAIRS WITHIN THE HEAD START POPULATION (THERE WERE NO SIGNIFICANT DIFFERENCES ON THE ZIGLER BEHAVIOR INVENTORY EXCEPT THAT THE CONTROL GROUP RECEIVED MORE FAVORABLE RATINGS IN THE AREA OF JEALOUSY), (3) FOLLOWUP OF CHILDREN FORMERLY ENROLLED IN A PREKINDERGARTEN PROGRAM--20 MATCHED PAIRS OF SECOND GRADERS (DATA COLLECTED FROM SCHOOL RECORDS OF ACHIEVEMENT IN READING, WRITING, AND ARITHMETIC SHOWED NO SIGNIFICANT DIFFERENCES BETWEEN CONTROL CHILDREN AND CHILDREN WHO HAD ATTENDED PREKINDERGARTEN), (4) CHILDREN'S CONCEPTUAL DEVELOPMENT AND LANGUAGE COMPREHENSION (RESULTS INDICATED THAT WHEN VERBAL INSTRUCTIONS ARE TO BE FOLLOWED, SYNTAX, TEMPORAL ORDER OF ELEMENTS, AND SEMANTICS GUIDE CHILDREN'S ACTIONS), AND (5) EXPLORATORY WORK ON BLOCKBUILDING AS A COGNITIVE INDICATOR (PROTOCOLS WERE COLLECTED ON THE MANIPULATIVE AND VERBAL BEHAVIOR OF 100 CHILDREN). SEVEN TABLES RELEVANT TO THE ABOVE FIVE AREAS ARE INCLUDED IN THE REPORT, ALTHOUGH PORTIONS OF THE REPORT ARE NOT AVAILABLE FROM EDRS. (MS)

TEACHERS COLLEGE, COLUMBIA UNIVERSITY

HEAD START EVALUATION AND RESEARCH CENTER

ANNUAL REPORT

Activities for Period - September 1966 through August 1967

Submitted by:
Robert L. Thorndike
November 30, 1967

FINAL REPORT

Head Start Evaluation and Research Center
Teachers College, Columbia University

Introduction

This report summarizes the accomplishments and the problems of the initial year of operation of the Head Start Evaluation and Research Center at Teachers College, Columbia University. The chief accomplishment was that complete evaluation data were gathered on 162 children in 23 classes in 9 Head Start Centers. Centers were located, cooperation was elicited, testers and clerical staff were recruited, and the data were gathered, rostered and supplied to the data-processing center.

For a variety of reasons, the problems were more and the accomplishments less than we would wish. Chief among these reasons was the matter of timing - timing first of all of the basic contracting arrangements, and timing secondly of the series of decisions that determined the Center's activities. This problem was certainly not unique at Teachers College, though it may have been more acute in our case, but it seems worth while to make it a matter of record.

The official contract for the Center was received by Teachers College on October 4, 1966. Long before that time Teachers College had committed itself to salaries for a director and associate director, but the balance of the staff had to be recruited in September and October. At that time, funding of Head Start Centers was still

incomplete, and it was not possible to find anyone in the New York OEO organization who knew where Head Start Centers were located or which ones were in operation. Several weeks at the beginning of the year were spent in merely developing a list of functioning and potentially available Centers. Details of testing and observational procedures continued to be worked out by the Research Division of Project Head Start and the Center Directors until practically the end of 1966.

Within this context, we recruited staff and testers, and organized for our work. Because of the urgency of the need to get the specified evaluational data, and because of the delays stemming from the late start, the search for Head Start Centers, and the shifting evaluational program, it was not until late in the program that time of either supervisors or assistants was available for the research side of the enterprise. As a result, the research yield of this first year is felt to be rather meager. Most of the effort went into obtaining and processing the evaluation data.

To a degree, the same problems of timing persist. Though funding from September to December 1967 was received in June, fiscal uncertainty beyond that point remains. And though most 1967-1968 evaluation procedures were agreed upon in early September, some uncertainties persist. So our Center is still hampered so far as advance planning is concerned both for personnel and for operations. It is our hope that these conditions will continue to improve if we are to function beyond the 1967-1968 year.

Personnel

The staffing of the Center is shown below. Three categories of staff are represented: (1) staff on the continuing Center payroll, (2) mental testers working on a per diem basis, and (3) the advisory staff that met periodically for conferences relating to the work of the Center.

Center Staff

Director: Robert L. Thorndike, Professor of Psychology and Education. Ph.D. Columbia 1935, Psychometrics and educational research. (on project 1/3 time)

Associate Director: Marvin Sontag, Asst. Professor of Psychology and Education. Ph.D. New York University, 1967, Psychometrics and educational research. (on project 2/3 time)

Project Associate: Mrs. Adina P. Sella, Licencie Es Science d'Education (Psychologie), University of Geneva, Switzerland 1962.

Project Assistants: Sharon Lerner, M.A. Teachers College, Educational Psychology 1966.

Karen Perloff, B.A. Barnard, Psychology 1965.

Martha Werman, B.A. Boston University, Education 1966.

Mental Testers

Mrs. Sylvia Habas, M.Ed. Rutgers University, Guidance and Personnel 1964.

Edward Kahn, Ph.D. candidate at Teachers College, Counseling.

Brian Maloney, Ph.D. candidate at Teachers College, Educational Psychology.

Edward Morante, Ph.D. candidate at Teachers College, Counseling.

Dorothy Toomey, Ph.D. candidate at Teachers College, Clinical Psychology.

Advisory Committee

Millie Almay, Prof. of Psychology and Education, Ph.D. Columbia 1948	Developmental Psychology
Lambros Comitas, Prof. of Anthropology and Education, Ph.D. Columbia 1962	Anthropology
Joseph H. Di Leo, Lecturer in Special Education, M.D. University of Bologna 1927	Pediatrics
Miriam Goldberg, Prof. of Psychology and Education, Ph.D. Columbia 1955	Educationnal Psychology
Elizabeth P. Hagan, Prof. of Psychology and Education, Ph.D. Columbia 1952	Measurement
Anne McKillop, Prof. of Psychology and Education, Ph.D. Columbia 1951	Educational Psychology
Helen Robison, Associate Prof. of Education, Ed.D. Columbia 1951	Early Childhood Education
Sloan Wayland, Prof. of Sociology and Education, Ph.D. Columbia 1951	Sociology
Mary Alice White, Prof. of Psychology and Education, Ph.D. Columbia 1948	School Psychology

RESEARCH ACTIVITIES

The research activities during the period covered by this report were for the most part, exploratory in nature. There was no substantial on-going research program at Teachers College, into which the Head Start research activities could directly integrate. Prof. Almy was working (with an Office of Education grant) on the effects of early programs in mathematics, science and economics on the cognitive development of kindergarten and first grade pupils, but this project did not extend below kindergarten level. Dr. Robison was working on the problem of developing adequate ways of describing the sequence of activities and transactions within pre-school classes, but was fully occupied working outside the Head Start context. Dr. Goldberg was directing a research program in beginning reading for the New York City schools, but this, once again, dealt with kindergarten and first grade children. Thus, the research activities started essentially from scratch.

Some information will be given on five lines of effort that were carried on during the year.

1. - Item Analysis of Evaluation Tests

With a view to understanding better the nature of the performance and of the changes in cognitive performance of the Head Start children, item analyses were conducted for both the Binet and the Caldwell Pre - School Inventory. These were carried out for both the pre - and the post - tests, so as to provide information on the amount of change on specific items, with the hope that this might give some clues as to the nature of any cognitive gains that were emerging.

Data for the Binet are given in Table VI. The data are reported in terms of tests passed or failed, with the tests grouped by age level. Presumably, all the tests at any one age level of the Binet were of substantially the same difficulty level for the original norming population (though one cannot be sure on this point). Table VI shows some interesting irregularities for our Head Start group. One might note that naming objects from memory (IV-2) and definitions (V-3) stand out as particulary easy in relation to other items at their levels.

In the absence of a control group of average or above-average socio-economic level, these results are only suggestive of a fairly substantial unevenness in the ability profile in the Head Start children.

In order to compare items with respect to gain from pre-test to post-test, percentages passing were converted to deviate values on a normal curve. Gains can be more readily compared for items of different difficulty using this metric. The typical gain was about 9/10 of a standard deviation unit, but Picture Vocabulary showed a gain of only 0.26, in contrast with Picture Identification for which the gain was 1.16, and Differences with a gain of 1.17.

Data for the Caldwell, which are shown in Table VII, were analyzed primarily with a view to evaluating (1) the appropriateness of the items in difficulty for the type and age of child with whom Head Start is concerned and (2) the responsiveness of items to the Head Start experience in terms of change from pre - to post - test.

The values shown in Table VII are in a converted scale in which percent succeeding with the item has been transformed to a deviation from the mean of the normal curve. This type of transformed score was considered to give a scale in more nearly equal units than the original percentage values. Data are grouped into the four sections that represent the four factors that the Caldwell is alleged to measure.

Items vary quite a bit both in initial difficulty level and in amount of change from pre-test to post-test. There is no special tendency for items showing large gains to be clustered in one section of the test more than any other. We are not prepared to offer any general hypotheses to account for the location of the large changes. However, at a level of crude empiricism, it does seem that selecting for future use in studies of the differential effects of differences in Head Start programs those items showing the larger changes would yield an instrument with maximum sensitivity per unit of testing time. This criterion, together with appropriate level of difficulty, has been used in suggesting an abbreviation of the Caldwell for use in the 1967-68 intensive cognitive testing.

2. Comparison of Age-Matched Group

One of the perennial problems in the evaluation of outcomes from Head Start programs has been the identification of and assembly of data on an appropriate comparison or "control" group. The span of ages within the Head Start population seemed to provide data for one model of comparison. Essentially, the pattern is to find in the Head Start sample one child whose age at the time of post-test

matches that of another child at the time of pre-test. As many pre-matched pairs of this sort as could be developed within our data were assembled. No child appeared in the post-test or the pre-test sample more than once, but a given child might appear in both the pre - and post-test samples. That is, a child who was 4-0 at the time of pre-test and 4-6 at the time of post-test might appear in the pre-test sample as the match to a 4-0 post-child and in the post-test sample as the match to a 4-6 pre-test child.

As indicated in Table IX most of the comparisons involving the Ziglers were not significant. One exception was notable. The control group received more faborable ratings in the area of jealousy.

3. Follow-up of Children Formerly Enrolled in a Pre-Kindergarten Program*

Introduction

The Norwalk Board of Education had been conducting a pre-kindergarten program for disadvantaged pupils for the past three years. The program was similar in form and substance to current Head Start programs. The program involved 60 pupils and two teachers. Both teachers are currently Head Start directors in Connecticut (one in Norwalk and one in Stanford). An attempt was made to relate atteendence in this Head Start Program to pupil performance during first grade.

*The project is indebted to Mr. Edward McKenroe and Miss Mary De Lito for their cooperation in this study.

PROCEDURES

Sample

The names of approximately 40 pupils (enrolled in the pre - kindergarten program during the 1963-64 school semester) in 15 schools who were currently in first grade were submitted to the project. Teachers in the classes in which these children were currently enrolled were asked to select a control child for each of the pupils involved, according to the following criteria:

> For each child listed below choose a control child in the same class who has <u>not</u> been exposed to a pre-kindergarten program. Controls are to be selected according to the criteria listed below. Place the control child's name on the appropriate line near the name of the pre-kindergarten child with whom he has been matched.

Criteria for Selection of Controls

1. Same sex as the child listed
2. Same ethnic group as child listed
3. Parental occupation that falls into the same (or closest) category as follows:

A. Professional and Managerial e.g., Physician or executive in large firm.

B. Sales and Technical e.g., lab technician.

C. Clerical and Related Workers e.g., bookkeeper.

D. Skilled Labor and Craftsman e.g., shop foreman, carpenter.

E. Operatives and Kindred Workers e.g., taxi-drivers, meat cutters, semi-skilled factory workers.

F. Service Workers e.g., waiters, household employees, counter-man.

G. Laborers e.g., carpenters helpers, assembly line workers, teamsters.

If you have a choice of more than one child as a control, choose the one that live in the neighborhood closest to the child who has had pre-kindergarten training.

A good deal of attrition was caused by transfers, incomplete records and the inability of the teachers to select controls. Twenty matched pairs of pre-kindergarten and control subjects were finally available for study.

Data

Only data available on school records were employed in this study. Since the pupils involved are currently in grade 2, records were available for grade 1 and kindergarten. The anecdotal descriptions in the kindergarten file were too sparse and too vague to be of much use. Final grades were available in the following subject areas: reading, arithmetic and writing. Attendence and lateness data were also available on each child. The only standardized tests employed were in the area of reading readiness, and records of these were too incomplete for use in this investigation.

RESULTS

As indicated above, 20 pairs of pre-kindergarten and control

children were available. Table X gives the sex and pertinant data on age for the subjects involved.

The first comparisons made between experimental and control groups was on the basis of grades given at the end of grade 1. Table XI presents those comparisons for reading, arithmetic, and writing.

No significant differences between pre-kindergarten and control children were found. Comparisons between the two groups under consideration were also made on available attendence and lateness data. These data were available for both kindergarten and grade one. Table XII presents these results. The pre-kindergarten group was superior to the control group in grade one attendence. No other differences were significant.

This study was conducted for pilot purposes. Few differences between the groups under consideration were found. A possibility exists that the matching, which was carried out by school personnal was inadequate. That is current achievement may have been taken into consideration in the equation process. Should a similar study be undertaken next year, all matching will be done by project personnel. In addition, an attempt might be made to go beyond the Norwalk population.

4. Children's Conceptual Development and Language Comprehension

The Head Start Evaluation and Research Center provided one half-time research assistant for Dr. Janellen Huttenlocher. Dr. Huttenlocher had been, and was at the time investigating children's comprehension of verbal instructions as a function of certain aspects of grammatical structure. Subjects were to carry out an action, i.e., place a colored block above or below a block of a different color on a "ladder", or place a colored truck in front of or behind a truck of a different color on a "road", in response to an instruction. One object was always the grammatical subject of the statement, the other the grammatical object. In general, the article that was the grammatical subject seemed to be prepotant in determining both the child's action and understanding. A number of variations of the experiment have been carried out, and with a range of different groups. The simple generalization given above tends to be confused somewhat by other interacting effects, and Dr. Huttenlocher summarizes this phase of her research as follows:

> "In sum, it seems as if syntax, temporal order of elements, and semantics guide S's actions. In these situations which are unstructured where S must place two items, S placed first the item that was mentioned first. In a more structured situation, where S must choose only one of two already fixed items, S will move the actor".

5. Exploratory Work on Block-Building as a Cognitive Indicator

Dr. Almy has had for some time hopes of starting some inquires into the role of play in the cognitive development of children. She held several discussions with E & R Center staff on possibilities of starting a program of research along this general line. Time did not permit as extensive planning as one might wish, but as a first line of exploration in this direction, data were gathered during the spring and summer of children's behaviors when provided with a stock of large wooden building blocks (Creative Playthings Inc.) and asked to build a house.

Protocols were obtained for 100 children in Head Start Centers, of whom 50 had completed a year of Head Start and 50 were newcomers. The protocol consisted of a running log of the child's behavior, both manipulative and verbal. Finally, when the child expressed himself as satisfied with his construction, photographs were made of the final product.

As of now, these data have been gathered and various aspects of the behavior and product have been coded. Work on the project continues as time permits.

Pages 28-37 of this document have been removed by OEO Head Start Facility.

TABLE VI

ITEM DIFFICULTY INDICES AND NORMAL DEVIATES FOR INITIAL AND FINAL BINETS

Subtest		Initial N=177			Final N= 162			Dif.
		F	%	Z	F	%	Z	$Z_F - Z_I$
III.	2 Picture Vocabulary	170	96	1.75	161	99	2.51	.76
	3 Block Building Bridge	169	95	1.64	161	99	2.51	.87
	4 Picture Memories	164	93	1.48	162	100	*	*
	5 Copying a Circle	166	94	1.55	162	100	*	*
III-6	1 Comparison Balls	130	73	.61	149	92	1.41	.80
	3 Discrimination-Animal	162	91	1.34	162	100	*	*
	4 Response to Pictures	158	89	1.23	158	97	1.88	.65
	6 Comprehension I	131	74	.64	155	96	1.75	1.09
IV.	1 Picture Vocabulary	87	49	-.03	95	59	.23	.26
	2 Naming Objects	141	80	.84	155	96	1.75	.91
	3 Opposite Analogies	115	65	.39	134	83	.96	.57
	4 Picture Identification	116	65	.39	153	94	1.55	1.16
IV-6	2 Opposite Analogies	69	40	-.25	100	62	.31	.56
	3 Picture Similarity - Dif.	107	60	.25	147	91	1.34	1.09
	5 Three Commissions	92	58	.05	126	78	.77	.72
	6 Comprehension	83	47	.08	138	85	1.04	.96

Table VI (cont)

Subtest		f	%	Z	f	%	Z	$Z_F - Z_I$
V.	1 Picture Completion	53	30	-.52	96	59	.23	.75
	3 Definitions	106	60	.25	144	89	1.23	.98
	4 Copying Square	37	21	-.81	93	57	.18	.99
	6 Patience - Rectangles	39	22	-.77	53	33	-.44	.33
VI.	1 Vocabulary	9	5	-1.64	36	22	-.77	.87
	2 Differences	11	6	1.75	46	28	-.58	1.17
	4 Numbers Concepts	4	2	-2.05	27	17	-.95	1.10
	5 Opposite Analogies	5	3	-1.88	25	15	-1.04	.84

* Cannot be determined.

TABLE VII

PRE - SCHOOL INVENTORY - FACTOR A - PERSONAL SOCIAL RESPONSIVENESS

N=183

	Initial			Final			Gain on base line of Normal Curve
	f	%	Z	f	%	Z	$Z_F - Z_I$
1. What is your first name?	157	86	1.05	140	89	1.23	.18
2. What is your last name?	82	45	-.13	68	43	-.18	-.05
3. How old are you?	111	61	.28	124	79	.81	.53
4. When is your birthday?	23	12	-1.18	39	25	-.67	.51
5. Show me your eye	170	93	1.48	155	99	2.33	.85
6. Show me your neck	150	82	.92	153	97	1.88	.96
7. Show me your shoulder	137	75	.67	130	83	.95	.28
8. Show me your heel	82	45	-.13	107	68	.47	.60
9. What call (ear)	168	92	1.41	154	98	2.05	.64
10. What call (finger)	146	80	.84	140	89	1.23	.39
11. What call (knee)	115	63	.33	125	80	.84	.51
12. What call (elbow)	59	32	-.47	107	68	.47	.94
13. Raise your hand	170	93	1.48	153	97	1.88	.40
14. Wiggle	96	52	.05	118	75	.67	.62

	Factor A (cont.)						
	f	%	Z	f	%	Z	$Z_F - Z_I$
15. Hello very loudly	115	63	.33	130	83	.95	62
16. Hello very softly	109	59	.23	133	85	1.04	.81
17. Face door	145	79	.81	147	94	1.55	.74
18. Jump	159	87	1.13	150	95	1.65	.52
19. Red car on black box	87	47	-.08	120	76	.71	.79
20. Blue car under green box	45	24	-.71	84	53	.08	.79
21. Yellow car on little box	55	30	-.52	81	51	.03	.55
22. One car in middle-size box	25	14	-1.08	26	16	-.99	.09
23. All cars one side, all boxes other side	49	27	-.61	90	57	.18	.79
24. 3 cars in big box	96	52	.05	118	75	.67	.62
25. 2 cars behind box in middle	43	23	-.74	58	37	-.33	.41
26. Give everything to me	126	69	.50	138	88	1.18	.68

PRE - SCHOOL INVENTORY - FACTOR B - ASSOCIATIVE VOCABULARY

	Initial			Final			Gain
	f	%	Z	f	%	Z	$Z_F - Z_I$
27. (Checkers) car that pulls train	16	9	-1.34	25	16	-.99	.35
28. (Checkers) last car on train	6	3	-1.88	21	13	-1.13	.75
29. Which way does saw go?	30	16	-.99	55	35	-.39	.60
30. Which way elevator?	60	33	-.44	74	47	-.08	.32
31. Which way ferris wheel?	27	15	-1.04	45	29	-.55	.49
32. Which way phonograph record?	45	24	-.71	78	50	.00	.71
33. Which way water fall?	21	11	-1.23	44	28	-.58	.65
34. When breakfast?	86	47	-.08	106	67	.44	.52
35. Time of year hottest?	9	5	-1.64	24	15	-1.04	.60
36. Time of year coldest?	12	6	-1.55	12	8	-1.41	.14
37. Time of year now?	7	4	-1.75	12	8	-1.41	.34
38. Where find lion	61	33	-.44	97	62	.31	.75
39. Where buy gas?	92	50	.00	113	72	.58	.58
40. Who go to if sick?	108	59	.23	98	62	.31	.08
41. Where find boat	114	62	.31	89	57	.18	-.13

Factor B (Cont)

	f	%	Z	f	%	Z	$Z_F - Z_I$
42. What do to read something?	88	48	-.05	116	74	.64	.69
43. What does dentist do?	65/24	35/13		91/39	58/25		
44. What does policeman do?	93/19	51/10		105/6	67/4		
45. What does teacher do?	56/9	31/5		54/24	34/15		
46. What does father do?	98/6	53/3		70/30	44/19		
47.What does mother do?	111/15	61/8		90/34	57/22		
43.	89	48	.05	130	83	.95	.90
44.	112	61	.28	111	71	.55	.27
45.	65	36	-.36	68	49	.03	.39
46.	104	56	.15	100	63	.33	.18
47.	126	69	.50	124	79	.81	.31

PRE - SCHOOL INVENTORY - FACTOR C1 - CONCEPT ACTIVATION - NUMERICAL

N=183

	Initial			Final			
	f	%	Z	f	%	Z	$\overline{Z_F Z_I}$
48. How many eyes?	143	78	.77	142	91	1.34	.57
49. How many noses?	119	65	.39	117	75	.67	.28
50. How many hands?	102	56	.15	111	71	.55	.40
51. How many toes?	4	2	-2.05	4	2	-2.05	.00
52. How many wheels - car?	37	20	-.84	57	36	-.36	.48
53. How many wheels - bicycle?	72	39	-.28	88	56	.15	.43
54. How many wheels - tricycle?	37	20	-.84	61	39	-.28	.56
55. How many wheels-wheelbarrow?	26	14	-1.08	44	28	-.58	.50
56. How many wheels-row boat?	14	8	-1.41	26	17	-.95	.46
57. Count (to 5)	127	69	.50	130	83	.95	.45
58. How many corners, paper	30	16	-.99	39	25	-.67	.32
59. 2 & 8 checkers, which more	122	67	.44	141	90	1.28	.84
60. 6 & 6 checkers, which more	8	4	-1.75	22	14	-1.08	.67
61. 2 & 8 checkers, which fewer	62	34	-.41	58	37	-.33	.08
62. Point to middle one	61	33	-.44	85	54	.10	.54

	Factor C1 (cont)						
	f	%	Z	f	%	Z	$Z_F - Z_I$
63. Point to first one	55	30	-.52	89	57	.18	.70
64. Point to last one	40	22	-.77	65	42	-.20	.57
65. Point to second one	37	20	-.84	29	18	-.91	-.07
66. Point to next to last	27	15	-1.04	21	13	-1.13	-.08

PRE - SCHOOL INVENTORY - CONCEPT ACTIVATION - SENSORY - FACTOR C @

N=156

	Initial			Final			
	f	%	Z	f	%	Z	$Z_F - Z_I$
67. Draw a line	163	89	1.23	154	99	2.33	1.10
68. Draw a circle	156	85	1.04	151	97	1.88	.84
69. Draw a square	55	30	-.52	92	59	.23	.75
70. Draw a triangle	40	22	-.77	58	37	-.33	.44
71. Which most like wheel	152	83	.95	149	95	1.64	.69
72. Which most like tent	89	49	-.03	87	56	.15	.18
73. Which most like stick	110	60	.25	126	81	.88	.63
74. Bigger, ball or bicycle	89	49	-.03	98	63	.33	.36
75. Bigger, tree or flower	119	65	.39	126	87	1.13	.74
76. Slower, car or bicycle	73	40	-.25	86	55	.13	.48
77. Heavier, brick or shoe	95	52	.05	112	72	.58	.53
78. Heavier, feather or fork	95	52	.05	91	58	.20	.15
79. What color is: (red crayon)	112	61	.28	132	85	1.04	.76
80. What color is: (black crayon)	111	61	.28	123	79	.81	.53
81. Same color as the sky	32	17	-1.13	36	23	-.74	.39
82. Same color as the night	78	43	-.18	108	69	.50	.68

Factor C 2 (cont)

	f	%	Z	f	%	Z	$Z_F - Z_I$
83. Color circle yellow	76	41	-.23	115	74	.64	.87
84. Color square purple	70	38	-.31	95	61	.28	.59
85. Color triangle orange	91	50	.00	121	77	.74	.74

TABLE VIII

Results on Stanford-Binet Intelligence Test and Caldwell-Soule Pre-School Inventory For Matched Pairs of Head Start and Control Pupils[a]

Variable		Head Start		Control
Stanford-Binet I.Q.	N	43		43
	M	100.16		96.07
	SD	9.30		12.81
	M_{dif}		4.09	
	F		3.24	
Caldwell: Total	N	41		41
	M	48.63		42.17
	SD	10.49		10.46
	M_{dif}		6.46	
	F		9.15	
Caldwell: Personal-Social	N	41		41
	M	18.39		16.73
	SD	4.09		3.54
	M_{dif}		1.66	
	F		4.01	

TABLE VIII (Continued)

Variable		Head Start		Control
Caldwell: Associative-Vocabulary	N	41		41
	M	10.17		8.29
	SD	3.37		3.84
	M_{dif}		1.88	
	F		<u>4.12</u>	
Caldwell: Concept-Number	N	41		41
	M	8.37		6.44
	SD	2.56		2.84
	M_{dif}		1.93	
	F		<u>11.43</u>	
Caldwell: Concept-Sensory	N	41		41
	M	12.90		11.05
	SD	2.61		3.44
	M_{dif}		1.85	
	F		<u>9.73</u>	

[a]Significant F ratios (p= .05) are underlined. An F ratios of 4.08 is significant.

TABLE IX

Results on Zigler Behavior Inventory For 43 Matched Pairs of Head Start and Control Pupils

Subtest		Head Start	Control
Sociability	M	23.88	24.67
	SD	5.55	3.77
	M_{dif}	.79	
	F	.48	
Curiosity	M	23.81	23.12
	SD	5.54	4.61
	M_{dif}	.70	
	F	.44	
Persistance	M	10.33	11.63
	SD	3.33	2.83
	M_{dif}	1.30	
	F	4.00	
Emotionality	M	22.74	23.44
	SD	5.54	5.72
	Mdif	.70	
	F	.40	

TABLE IX (cont.)

Subtest		Head Start		Control
Self-Confidence	M	11.67		11.65
	SD	3.02		2.77
	M_{dif}		.02	
	F		.00	
Jealousy	M	10.98		11.96
	SD	2.79		2.84
	M_{dif}		.98	
	F		16.00	
Achievement	M	17.26		15.84
	SD	4.24		4.40
	M_{dif}		1.42	
	F		2.04	
Leadership	M	5.00		5.51
	SD	11.61		1.63
	M_{dif}		.51	
	F		2.25	
Total Adjustment	M	141.86		145.68
	SD	21.42		26.43
	M_{dif}		3.82	
	F		.02	

TABLE X

Sex and Age of 20 Matched Pairs of Pre-Kindergarten and Control Children

Group	Boys	Girls	M Age in Months	SD	Range
Pre-Kindergarten	11	9	87.30	3.25	81-92
Control	11	9	87.55	4.42	81-99

TABLE XI

Distributions of Grades for Various Subject Areas for 20 Matched Pairs

Subject	Group	N	GRADES A	B	C	D	E	Sign Test
Reading	Pre-K	20	5	6	6	3	0	ns
	Con.	20	3	7	7	2	1	
Arithmetic	Pre-K	20	3	5	8	4	0	ns
	Con.	20	1	6	9	3	1	
Writing	Pre-K	20	4	8	7	1	0	ns
	Con.	20	4	6	8	1	1	

TABLE XII

Results of Wilkoxin Matched Pairs Signed Rand Test for Attendance and Lateness Data

Group	Grade	N	Sum of Ranks * Attendance	Sign
Pre-K	K	16	44.5	ns
Con.	K	16	74.5	
Pre-K	1	18	130.0	.05
Con.	1	18	38.0	

* Ranked from low to high.

TABLE XII (cont)

LATENESS

Pre-K	K	18	19.0	ns
Con.	K	18	47.0	
Pre-K	1	18	51.5	ns
Con.	1	18	14.5	

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