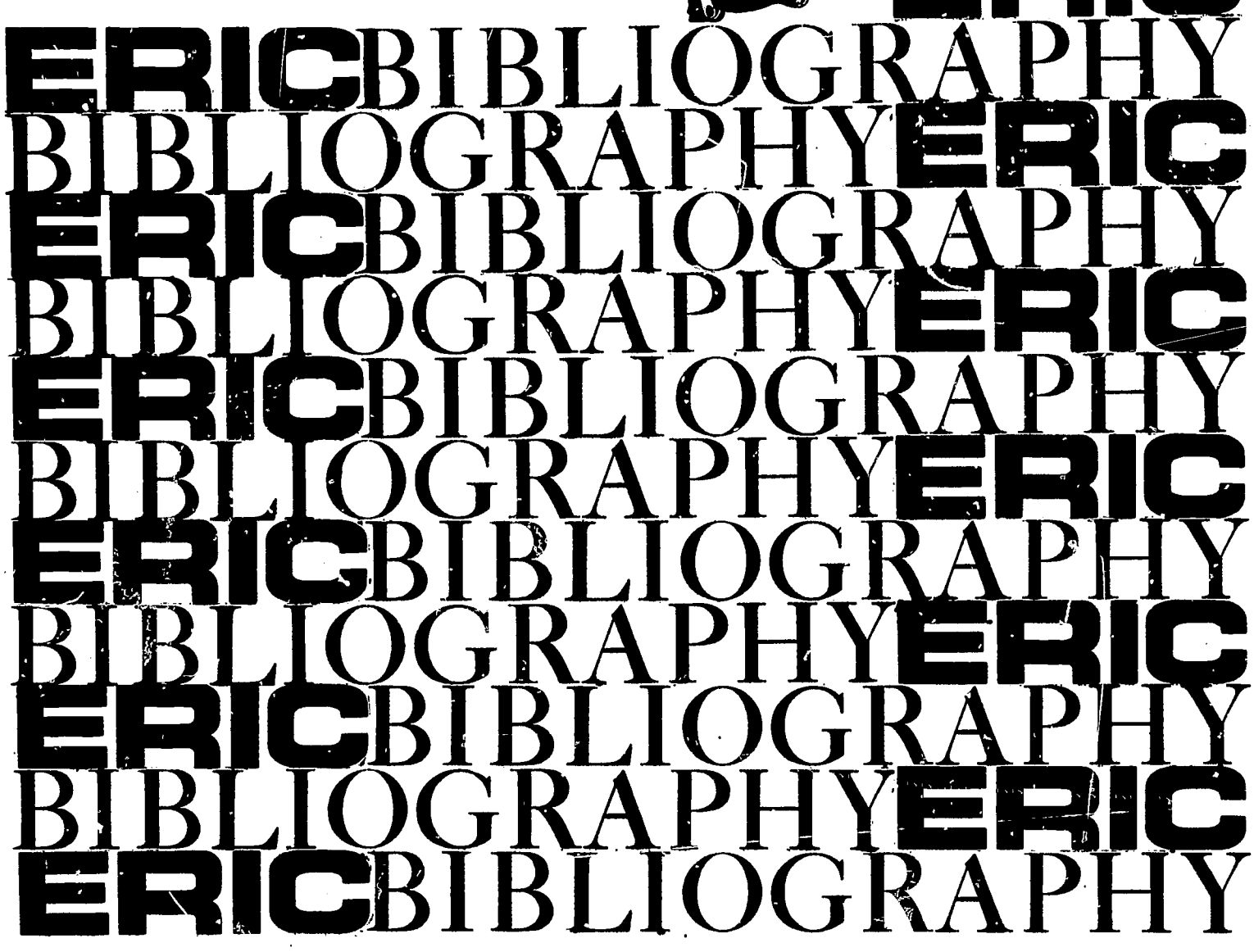
DOCUMENT RESUME

ED 022 538 PS 001 134

EARLY CHILDHOOD SELECTED BIBLIOGRAPHIES SERIES. NUMBER 2, LANGUAGE.
ERIC Clearinghouse on Early Childhood Education, Urbana, Ill.
Spons Agency-Office of Education (DHEW), Washington, D.C.
Pub Date 68
Contract-OEC-3-7-070706-3118
Note-47p.
EDRS Price MF-$0.25 HC-$1.96
Descriptors-*ABSTRACTS, *ANNOTATED BIBLIOGRAPHIES, *EARLY CHILDHOOD EDUCATION, GRAMMAR, *LANGUAGE, PHONOLOGY, SPEECH, VERBAL LEARNING, VOCABULARY

This is the second in a series of six annotated bibliographies. It has as its general subject the language aspects of early childhood education and includes six subdivisions: phonology and speech, grammar, vocabulary, functions of language, verbal learning, and "all." Each of the 38 abstracts included has been classified by general and specific subject, by focus of study, and alphabetically by author. Focus of study categories are normative, environmental, measurement and techniques, intervention, pathology, physiology, animals, and general. The general subjects of other bibliographies in the series are physical, education, cognition, personality and social aspects of early childhood education. (MS)



EARLY CHILDHOOD

SELECTED BIBLIOGRAPHIES SERIES

Number 2

LANGUAGE

University of Illinois
805 W. Pennsylvania
Urbana, Illinois

2

EARLY CHILDHOOD

SELECTED BIBLIOGRAPHIES SERIES

LANGUAGE

ERIC Clearinghouse on Early Childhood Education
805 West Pennsylvania Avenue
Urbana, Illinois 61801

This bibliography was prepared pursuant to a contract with the Office of Education, U. S. Department of Health, Education and Welfare. Contractors undertaking such projects under Government sponsorship are encouraged to express freely their judgment in professional and technical matters. Points of view or opinions do not, therefore, necessarily represent official Office of Education position or policy.

Prepared Under USOE Contract No. 3-7-070706-3118

1968

This bibliography is Number 2 in a series of six. The general subject is Language, and it is divided into the following six specific subjects:

1. Phonology and Speech
2. Grammar
3. Vocabulary
4. Functions of Language
5. Verbal Learning
6. All

The five other bibliographies in this series contain the following general subjects:

1. Physical
3. Education
4. Cognition
5. Social
6. Personality

Every abstract in this series has been coded at four levels; namely, general subject, specific subject, focus of study, and alphabetical by author. In all six bibliographies the focus of study is coded as follows:

1. Normative
2. Environmental
3. Measurement and Techniques
4. Intervention
5. Pathology
6. Physiology, etc.
7. Animals
8. General

CONTENTS

AUTHOR INDEX

2.1
SPEECH

2.1.1 NORMATIVE

2.1.1.1 Bruce, D. J. Analysis of word sounds by young children. British Journal of Educational Psychology, 1964, 34, 158-170.

Hypothesis: The recent work of Russian linguists (Luria, Lublinskyaya) suggests that factors of linguistic development are systematically related to the course of a child's intellectual progress. One such factor is the child's ability "...to operate on his own language as object" (p. 158); e.g., to make simple phonetic analyses of the spoken word, a skill which is important in learning to read. Operational hypothesis: children of different mental ages differ in their ability to analyze word sounds into two phonic constituents.
Methods: Subjects: 67 British school children between the ages of 5.1 and 7.6 were selected from three State schools. Twelve children from the first school were matched with 12 children from each of the other schools on sex, chronological age, mental age, IQ, school form, and father's occupational status.
Design: The classificatory variable was mental age, as measured by the Stanford-Binet, Form L-M. The measured variable was each child's performance on an orally presented individual "word analysis" test, which consisted of 30 words familiar to the 5- to 5.6-year-old (according to Burrough's vocabulary count). The subject was to report what word would be left if a particular sound was left out; e. g., "s" from "stop." The stimuli varied in their familiarity to the child and the position of the omitted letters; e. g., s(t)and, (n)ice, part(y); these variables were randomized in the presentation order. Before the test was administered each child was worked with in a standardized situation designed to ensure his understanding of the tasks. The test session was recorded on tape. Following the test, the child was asked about his background and any unclear aspects of his performance.
Findings: (no significance levels reported): For the total population, the mean test scores of the groups of the same mental age (MA) increased with the MA. For each school population Kendall's "tau" showed a "significant" correlation between word analysis scores and MA ("tau" = .58, .72, .57). All children below MA 7 showed little or no ability to perform the word analysis task; some, but not all, children in the lower

forms with MA of 7 lacked success. In each of the three schools, there was a sudden increase in ability to do the test at MA's above 7; the MA at which the increase occurred varied with the school and appeared related to the individual school's emphasis on instruction in phonics. For a given MA beyond MA 7, the test scores increased with the higher forms. There were qualitative differences in the strategies that children below and above MA 7 demonstrated in response the word analysis task, differences in terms of success with omitted letters in different positions and with types of errors.

Conclusions: The results support previous findings suggesting that the ability to make a simple phonetic analysis of spoken words develops with age. A certain level of mental development (MA 7) must be reached before education in phonics is beneficial. The process of phonic analysis is effected by positional and holistic factors, and differences in strategy.

2.1.1.2 Wolski, W., and McIntire, M. A guide to normal speech and language development in children. Medical Times (New York), 1964, 92, 202-205.

This is an article which applies the normative data of language development in the normal child (Gesell, McCarthy, Templir--pre-1960) to diagnostic indicators of abnormality which the family physician can use.

2.1.3 MEASUREMENT AND TECHNIQUES

2.1.3.1 Salzinger, S., Salzinger, K., Portnoy, S., Eckman, J., Bacon, P. M., Deutsch, M., and Zubin, J. Operant conditioning of continuous speech in young children. Child Development, 1962, 33, 683-695.

Hypothesis: Techniques from behavior theory can be useful in studying child language; i. e., they can determine such things as response classes precisely.

Methods: There are five experiments in which the type of reinforcement schedule and the subject group used varied.

Subjects: The number of subjects in the experiments ranged from four to 23 in the age range of 4 to 7 years drawn from nursery school and first grade. Independent variable: type of reinforcement schedule used in each experiment (variable ratio, fixed interval, intermittent, and control). Dependent variable: rate at which words are uttered by subject. Treatment: operant conditioning of the word rate, including sessions

of conditioning, extinction, and reconditioning. The apparatus was a papier-mâché clown's head that had a nose which lighted up as reinforcement. Reinforcement was contingent upon different aspects of the child's speech.
Results: The statistics reported, based on Friedman nonparametric analysis of variance, were complicated and are not fully reported here. In brief, there seems no doubt that when the amount of reinforcement by any schedule exceeded a certain minimum, an increase in work rate occurred.
Conclusion: "Treating speech as behavior in and of itself, and not as a symbolic representation of underlying meaning, has demonstrated lawful relationships which fit the general theoretical framework of behavior theory" (p. 692).

2.1.5 PATHOLOGY

2.1.5.1 Counihan, D. Stuttering: etiology and prevention. Clinical Pediatrics, 1964, 3, 229-232.

Summary: Recent studies indicate that stuttering is largely learned and can be diagnosed between the second and fifth year of life (the speech learning period). It is a developmental phenomenon, which evolves from normal nonfluencies of childhood and grows through a series of phases. The etiology appears to be either: (1) lack of success in and/or (2) unsuitable speech standards set for him. Treatment is more successful if it is begun early; that is, before stuttering becomes part of the child's self-concept; it is best directed towards the child's environment, especially his parents.

2.1.5.2 Richardson, S. O. Pediatric evaluation of speech and hearing disorders. Clinical Pediatrics, 1964, 3, 150-152.

Problem: Differential diagnosis of language disorders. (Five per cent of preschool children have severe enough disorders to impede language development; 15 per cent of school population have sppech or hearing problems requiring therapy.) Classification of Speech Disorders Based on Symptomatology: 1. Disorders of rhythm (e.g., stuttering); 2. Disorders of articulation--neuromotor disturbances (dysarthria); functional disturbances (dyslalia); 3. Disorders of phonation (e.g., hypernasality); 4. Disorders of symbolization (e.g., aphasia, a central nervous system deficit). Diagnostic approaches: Case History. Physical Examinations (general motor function, speech motor function, hearing evaluation, psychomotor function). Observation of Behavior and Psycholinguistic Abilities (including perceptual maturity, Bender-Gestalt

Visual Motor Test, Draw-a-Person Test, spatial relationships--e.g., Seguin Formboard, intelligence tests).

2.1.5.3 Shank, K. H. Recognition of articulatory disorders in children. Clinical Pediatrics, 1964, 3, 333-334.

Shank maintains that a developmental pattern in articulation exists--see the norms established by Poole, 1934, and Templin, 1957.
Articulation: "...stoppage or constriction of the breath stream in order to form specific sounds." He suggests that before calling something misarticulation, the age norms must be taken into account, for some lack of distinct articulation normally occurs in the development of the young child.

2.1.5.4 Walker, E. A., Jr. Hearing and related problems in childhood. Clinical Pediatrics, 1964, 3, 414-417.

The author discusses the problem of hearing assessment under the age of six (freefield, electrodermal, and electroencephalographic audiometry) and of the various types of hearing loss.

2.1.8 GENERAL

2.1.8.1 Lenneberg, E. H. The capacity for language acquisition. In J. A. Fodor and J. J. Katz (Editors), The structure of language. Englewood Cliffs, New Jersey: Prentice-Hall, 1964, pages 579-603.

The purpose of this paper is to add a new dimension to the explanation of language acquisition. As a social psychologist with an interest in biological research, Lenneberg attempts to combine the explanatory principles of the two disciplines: in viewing language as a system with a genetic substrate and a certain sequence of development, he extends the explanatory principles of developmental biology to postnatal behavior; in viewing behavior as a continuum from the moment of fertilization, he extends the psychological principle of the interplay between organism and environment to the prenatal period.

Lenneberg criticizes existing theories which explain language acquisition in purely environmental terms, because they account only for the product, not the process. He cites the theories and supporting empirical work of developmental biologists and linguists as indication that stochastic,

reinforcement, and imitation models of language acquisition are not sufficient.

Lenneberg, in this paper, proposes to demonstrate the logical possibility that language is the result of a biological predisposition in addition to sociocultural influences. Using a series of criteria based on evolutionary history, he distinguished behavior based on a specific predisposition (walking erect) from that based on a general capacity and developed largely by cultural influences (writing). He examines language in this logical framework and concludes that the capacity for language acquisition is close to being a specific predisposition.

2.2
GRAMMAR

2.2.1 NORMATIVE

2.2.1.1 Erwin, S. Imitation and structural change in children's language. In E. Lenneberg (Editor) New directions in the study of language, Cambridge, Massachusetts: Massachusetts Institute of Technology Press, pages 163-189.

Erwin's paper is primarily theoretical but contains a small amount of empirical work. To obtain some information about whether imitation is a significant source of progress in the acquisition of grammar, she asks if imitated utterances differ grammatically from those produced freely, and, if so, whether they are more advanced grammatically. She implies, but does not specify, the significance of an answer to the operational question for the theoretical question.

Erwin does not fully report the research methods used. Subjects: five 2- to 3-year-olds, some male, some female. Procedures: for each subject, the experimenter does the following: (1) writes a descriptive grammar of freely generated sentences; (2) collects from subject spontaneous imitations of adult sentences; (3) compares number 2 with number 1 for consistency of the rules employed. [She defines "grammar," "imitation," and "grammatically consistent" in semioperational terms but does not report how the sentences to be imitated were presented or selected nor the measures of consistency used.] Design: Two treatments for each individual--freely generated and imitated sentences--were examined for the consistency of the structural rules used.

For four out of five children, the samples of imitated sentences and of freely generated sentences were found to be equally predictable from the rules of the child's grammar and remained so for the duration of the experiment.
It was difficult to find a grammar that would describe either type of sentence for the fifth child.

From her findings that imitated sentences are, if anything, simpler than freely generated ones, Erwin concluded that no

evidence exists that ["progress toward adult norms of grammar arises merely from practice in the overt imitation of adult sentences" (p. 172)].

Erwin discusses the empirical findings of several psycholinguists in relation to the predominant theories of language development, which are (1) that the child imitates adult sentences and gradually eliminates abbreviations and errors as he grows older, (2) that the child comprehends adult sentences but makes random errors in speaking, and (3) that language in children evolves from successive systems of rules of increasing complexity.

In finding that the empirical evidence that exists does not agree with any one theory but reflects processes involved in each, Erwin suggests that imitation and comprehension must account for the accretion of instances which eventuate in systematic changes and rules.

2.2.1.2 Heiman, M., Jacoby, M., Kress, S., Potter, J., Smith, N., Strong, P., and Weiner, L. A study of the inflexibility in language of 4-year-olds. (Product of C-22 class at Harvard Graduate School of Education), Mimeographed, 1967.

The purpose of this study was to examine the statement made by Carl Bereiter and Sigfried Englemann (Teaching Disadvantaged Children in the Preschool, Prentice-Hall, New Jersey, 1966) that disadvantaged children have a language pattern that differs from that of the normal child: disadvantaged children have a "giant-word syndrome," that is, they use word groups which they cannot take apart and recombine and thus their language is "inflexible." The authors of the present study hypothesize that significantly more giant-word groups are used by lower class children than by middle class children and that the difference in language is associated with class rather than race.

There were 40 children in the sample on which the results of the study were based, 10 lower class Negroes, nine lower class whites, five middle class Negroes, and 16 middle class whites. The children were selected (without random or matching procedures as such) from among the 4-year-olds in certain preschool classes (classes in which there was no formal teaching). All subjects were examined individually with an instrument constructed from parts of other tests (including subtests from the Englemann Cognitive Maturity Test and from the Illinois

Test of Psycholinguistic Abilities). The main purpose was to check the child's ability to focus on one part of a larger language unit; e. g., a single word in a phrase or a phrase in a sentence.

The data was tested for significance in an analysis of variance; the effects of race, class, and their interaction were analyzed. No significant difference was found in the use of plurals or on the Cognitive Maturity Test, which presumably tested the ability to focus on one phrase of a sentence. Disadvantaged children of both races were significantly less able (.05 level) than middle class children to separate and reverse words in phrases. Lower class children were significantly less able (.01 level) to characterize objects verbally; in this test, there was a significant interaction (.01 level) of race and class: lower class Negro children were less able than low class white children.

The authors conclude that their results are mixed enough that Bereiter's and Englemann's statements about the unique language pattern of disadvantaged children (and their prescriptions for teaching based upon their statements) should be questioned further.

2.2.1.3 Kean, J. M., and Yamamoto, K. Grammar signals and assignment of words to parts of speech among young children: an exploration. Journal of Verbal Learning and Verbal Behavior, 1965, 4, 323-326.

This is a partial replication and expansion of the study by Brown and Berko, 1960.

Hypothesis: "...regardless of sex, syntactic clues become increasingly important in classification of words as a function of age in young children" (page 323).

Methods: Sixty subjects--20 kindergarteners, 20 second graders, 20 fourth graders (the total populations of these grades in a university school with the exception of eight children eliminated because of foreign origin, nonresponse, and faulty note taking). There was an equal number of children of both sexes in the total population but not in each grade.

Design--independent variables: grade placement (K, 2nd, 4th), sex, part of speech (count nouns or transitive verbs). Dependent variable: type of syntactical classification used by children in a particular grade for six unfamiliar words. Treatment: Six words, which can be used as count nouns or as transitive verbs

(e.g., bluff) and are unfamiliar to the child (Thorndike and Lorge, vocabulary lists, 1955, 44), were embedded in questions which signalled the chosen grammatical usage ("Do you know what a _____ is?" vs. "This is a picture of a girl who wants to _____ something."). The questions were presented individually to each subject in a random order with a randomly matched picture (which was meant only to stimulate but not alter responses). Subject was asked about his response until it could be categorized in adult usage as being the same part of speech as the stimulus (homogeneous) or different (heterogeneous). Statistics appear to be based on a calculation of the mean homogeneous response scores for various groups and on a three-way ANOVA ("repeated measurements, unweighted means") in which the effects considered were grade, sex, and part-of-speech.

Results: The mean incidence of correct (homogeneous) assignment of unfamiliar words to parts of speech ranged from 41.7 to 90.7. In the ANOVA, no main effects or second-order interactions were statistically significant. All first-order interactions were either significant or approached significance: Grade by Sex ($p < .05$); Part-of-Speech by Grade ($p < .01$); Part-of-Speech by Sex, ($p < .10$).

Conclusions: Children usually responded to the stimulus words with correct identification in terms of the part-of-speech used; even though the number (three) of responses asked for was small, the consistency of response does not appear to be a function of chance. It reinforces Brown and Berko's earlier finding that "...children use syntactic signals to deduce the meaning of unfamiliar words." Children already have a usable grammar by the time they reach elementary school.

A qualitative analysis of the significant Grade by Part-of-Speech interaction suggests a shift in the relative proportions of count nouns and transitive verbs in the speech of children, count nouns being preponderant earlier but the use of transitive verbs increasing rapidly. The Part-of-Speech by Sex interaction may be related to the difference in active and static roles played by the sexes. And the difference in grade by Sex interaction indicates possible difference in patterns of the acquisition of grammar.

2.2.1.4 Menyuk, P. Syntactic structures in the language of children. Child Development, 1963, 34, 407-422.

Purpose: To explore the efficacy of using Chomsky's model of transformational grammar to describe the language of children. ("Efficacy" involves being able to describe the language as a self-contained system at a particular time and being able to describe the system as it changes with the maturation of the child.)

Methods: Subjects: 96 children without physical defects that impaired speech, with an IQ above 90 (as measured by the Full Range Picture Vocabulary Test) and from the upper 24 per cent of the middle class population. Forty-eight children were from nursery school (age 3.1 to 4.4) and 48 from first grade (age 5.11 to 7.1); the sex distribution was approximately the same.
Design: Independent variables: age, sex, IQ. Dependent variable: the number of structures grammatically acceptable and unacceptable on the three levels of grammar. The language sample was collected in three situations: spontaneous speech in response to a projective test (Blacky pictures); conversation with the adult experimenter which was generated by set questions; and conversation with peers generated by role playing in a family setting.
Results: At the "...phrase structure level of grammar...and morphological level of grammar,...all children used all the structures in a grammatically acceptable form" (page 410). Some children also used ungrammatical forms. Of the acceptable forms, only comparisons of transformational rules used were made. For acceptable forms, chi-square tests indicated that some transformations (e.g., passive) were used by significantly more first graders than nursery children ($p < .05$) while the inverse was never true. Some transformations (e.g., use of auxiliary verb "have") were possessed by most of the children in first grade; some are possessed by "significantly" less than 100 per cent. There were no significant differences in the usage of boys and girls or of children above and below the mean IQ. For restricted forms, compared at all three levels of grammar, using a chi-square technique, corrected for small cells. In both phrase structure and morphological rules, significantly more nursery school children omitted acceptable forms. There was no significant difference between age groups in the total number of unique forms used, but there were differences in the type of unique form.
Conclusions: Chomsky's model is adequate to describe child grammar both in terms of the moment and of a developmental process. All basic structures (phrase-structure level) used by adults to generate sentences can be found in the grammar of nursery school children. As age advances, structures are added to structures, which is in keeping with the mean sentence length as a measure of maturity, but there is no difference in the basic structures used. Those grammatically acceptable structures used at an early age are used consistently as the child matures.

2.2.1.5 Weathersby, R. Describing patterns of connector use. Working paper submitted to the School Language Group, Harvard Graduate School of Education, Cambridge, Massachusetts, Mimeographed, 1967.

This paper outlines a theory and techniques for describing patterns of "connector" use (a class of words that are essentially conjunctions) in the language of 10-year- old children, young adolescents, and adults. The idea behind the paper is that the connectors a child uses may reflect the level of his language development.

The material in this paper is drawn from a content analysis of samples of spoken and written language of eight subjects (two 10-year-olds, four ninth graders, and two educators). The form of the analysis is based on classification categories found in Gleason's Linguistics and English Grammar and on a posited sequence of connector difficulty determined by the number of syllables in the word, presence or absence of negation, and the "specificity or logical sophistication of each word as it is generally used" (page 6).

2.2.3 MEASUREMENT AND TECHNIQUES

2.2.3.1 McCarthy, J. J. Notes on the validity of the ITPA. Mental Retardation, 1965, 3, 25-27.

Problem: To explore the validity of the Illinois Test of Psycholinguistic Abilities, first constructed by McCarthy and Kirk in 1961.
Methods: Eighty-six subjects, selected to resemble closely the standardization sample. Statistics: correlation coefficients (not presented as such in the paper).
Conclusions: The results indicate reasonable concurrent, predictive, and construct validity; content and diagnostic validity need further study. Cautions based on results for the use of the test: (1) Encoding Subtests deviate from the Examiner's Manual; (2) In the diagnosis of children with linguistic defects, auxiliary tests should acco[illegible] any the ITPA.

2.3
VOCABULARY

2.3.1 NORMATIVE

2.3.1.1 Huttenlocher, J. Children's language: word-phrase relationship. Science, 1964, 143, 264-265.

In this study, Huttenlocher attempts to substantiate unsystematic observations that young children have greater difficulty reversing words that belong to a grammatical pair than they do reversing the order of pairs of digits or pairs of single letters. She explains her results by reference to the postulates of transformational grammar.

Methods: The independent variable, which could be manipulated, was the type of task a child was asked to perform on the stimulus material. The dependent variable was the relative difficulty the child had in performing the task; this was measured by the proportion of errors made. The stimulus material, which was randomly ordered for each child, consisted of 15 pairs of verbal items, three in each of five categories. There were two types of "nongrammatical" pairs: (1) letters and numbers, such as "5-2" and "D-S"; (2) like parts of speech, such as "black-white." There were three types of "grammatical" pairs: (3) pairs that are encountered frequently but do not form a grammatical sequence when reversed, such as "man-run"; (4) pairs that are encountered frequently and do form a grammatical sequence when reversed, such as "I-do"; and (5) various pairs that are not commonly encountered, such as "orange-cow."
A samples of 66 children (age 4 years, 6 months to 5 years) was randomly assigned to two groups. (The method of selection of the sample and details about its composition are not reported.) The same stimulus material was presented to both groups, each group having a different task to perform on it. Group I was asked to reverse orally the order of the items in the pair, so that the response to the stimulus pair "black-white" would be "white-black." Group II was instructed to separate the items by a tap thus: "black"--tap--"white." Because of the relative difficulty of the categories of stimulus material, consideration was limited to the performance of those children who had at least some correct and one incorrect response (number of subjects was 36; 17 in Group I; 19 in Group II). (Data from the other 30 subjects was used only to support the assumption made in designing the experimental tasks that the ability to separate items is prerequisite for the ability to reverse their order.)

For each of the experimental groups, a Friedman two-way Analysis of Variance by rank was performed. In this non-parametric procedure, it appears that the columns represent the five different categories of stimulus material, and the rows represent the individuals in a group.

Findings: Significant differences (beyond the .001 level) are reported between categories for each group. The proportion of items each group missed in categories 3 and 4 (common English sequences) was much greater than in categories 1, 2, and 5 (nongrammatical or uncommon sequences). Of the children who failed the tasks completely (i.e., those not included in the statistical analysis), fewer children failed the separation task than failed the reversal task. Huttenlocher concludes that both experimental groups had the most difficulty when dealing with common English sequences and that the words in which errors in reversal occurred are those that rarely occur in isolation for the young child. She explains these conclusions by reference to postulate that multiple word utterances are the units first learned by the child and that only gradually are they differentiated into separate words. Huttenlocher staes her assumption that the ability to separate items precedes the ability to reverse them is supported by the similar error patterns shown by both groups and by additional testing of subjects who failed all items in their task. If one reasons on the basis of transformational grammar, such a result would be expected since reversal is an additional transformation.

2.4
FUNCTIONS OF LANGUAGE

2.4.1 NORMATIVE

2.4.1.1 Davis, E. A. The form and function of children's questions. Child Development, 1932, 3, 57-74.

In order to consider the form and function of children's questions, Davis analyzed the 50 questions recorded from a child by each of 73 self-selected mothers of middle to upper socioeconomic status. The number of subjects (73 children with an unequal distribution of age and sex) was so obtained. Questions were recorded at the time of observation, which was conducted in the natural home setting by the mothers, untrained observers with minimal directives (they were to record 50 questions in as near a continuous time sequence as possible, the context of the question and to whom it was addressed). For the purposes of comparison, questions of adults in legal testimony were obtained.

Questions were analyzed for the interrogative form used (intuitive classification) and function (classification through modification of Piaget's scheme in The Language and Thought of the Child). Interscorer reliability with the Piaget-type classification was .77. In order to compare groups of children, Davis made post-hoc classifications on the basis of age and/or sex; the groups varied in size. Statistical analysis was based on computation of means, percentage distributions, and "D/SD diff." No levels of significance were reported.

Davis reports normative findings without any indication of their significance. There appeared to be age and sex differences (younger vs older, male vs. female) in the rate, mean length, interrogative form, and function of the questions. Interests, as manifested by the questions, varied with age. "There was no age or sex difference in the tendency to ask a series of logically related questions starting from a single topic" (page 73).

Davis recognized the limited nature of the study and drew only tentative conclusions from it: she saw indications that, for the group of children studied, questioning was used for satisfactory contact with people, obtaining of information, perfection of language, and adapting to the environment.

2.4.1.2 Piaget, J. The language and thought of the child. (Second edition); translated by Marjorie Gabain. Cleveland, Ohio: Meridian Books, 1955. Pages 11-251.

Of the five studies reported in the book, four concern the age range 3 1/2 to 8 and are reviewed below. (The study not reported concerns verbal understanding in the child of 9 to 11.) The sample for each was arbitrarily selected from Swiss children in an unstructured school setting.
STUDY I: Face validity and interrater reliability of categories selected for the analysis of the function of language; frequency distribution of the language sample among these categories. Method: Two subjects, boys, age 6 1/2 years. The corpus of sentences collected through observational techniques by experimenters consisted of 1400 sentences from one subject and 1500 from the other (excluding remarks made to adults). The study was replicated with 20 subjects, ages 3 1/2 to 7.
Analytical scheme for functions of language:

A. Ego-centric Speech (not including "ethical" or affective matters): child speaks of his own concerns, ignoring the viewpoint of his audience, if, indeed, there is one.
   1. Repetition of words and syllables without intent to communicate;
   2. Monologue: child talks to himself;
   3. Dual or Collective Monologue: although another child is associated with the action or thought of the moment, the remarks of the children parallel each other rather than interact and no response is expected;
   4. Pseudo-questions: remarks in interrogative form to which no answer is expected; e.g., subject answers his own question.

B. Socialized Speech: that with intent to communicate; e.g., when subject expects something done as a result of his speech.
   5. Adapted Information: interchange of remarks and modification of ideas;
   6. Criticism and Derision: remarks made about the work or behavior of others which are often affective and assertive of the superiority of self;
   7. Commands, Requests, Threats;
   8. Questions and Answers: there are numerous subdivisions (treated more fully in Study 4, which is Chapter V of the book).

Conclusions: The analytical scheme fits the data, and the interrater reliability is about .97. Ego-centric speech represents nearly one-half of the spontaneous utterances a child makes.

STUDY II: Types and stages in the conversations of children. Method: 20 subjects ages 3 1/2 to 7 (same population and corpus of sentences used for the replication of Study I). Experimenter collected 63 spontaneous conversations, each defined as being a minimum of three consecutive utterances among children. Conclusions: A child passes through three stages of conversation before age 7, progressing from monologues that accompany collaboration in action (before age 5 1/2) to argument and collaboration in abstract thought (after age 7).

STUDY III: Degree of understanding and attempted verbal explanation between children of the same age. Method: 50 subjects; 20 children between ages 6 and 7; 30 between 7 and 8; paired somehow within own age group. The experimenter asked subject to repeat a story told him by experimenter to the naive partner, who then told the story to the experimenter. Analyses were made of the number of points in the story which were told to the partner, and, of these, the number the partner reproduced. Conclusions: The older group reproduced more points when telling the partner (measure of "verbal explanation") and when the partner told experimenter (measure of "understanding") than the younger group did. This study parallels earlier ones in showing the ego-centric nature of thought and speech in the younger child.

STUDY IV: Extension of Study I in the classification of the "logical function" of children's questions. Method: One subject, a boy, a little older than 6. Corpus of language analyzed consisted of 1,125 questions subject spontaneously asked of his adult female companion. The complex analytical scheme largely concerns questions of descriptive fact versus questions of explanation and causality. Conclusions: "The main categories of child thought between the years of 3 and 7 to 8 are. . ." (page 238) causality, reality (time and place); motivation of actions, justification of rules; classification, names, numbers, logical relations.

2.4.2 ENVIRONMENTAL

2.4.2.1 Olim, E. G., Hess, R. D., Shipman, V. C. Role of mothers' language styles in mediating their preschool children's cognitive development. Paper delivered at the American Educational Research Association Conference, Chicago, 1966.

Purpose: The paper reports on a study of "the role of mothers' language behavior in mediating the potential educability of preschool children" by investigating the relationships between different speech patterns and functions and cognitive development.

Method: Subjects were 163 nonworking Negro mothers and their 4-year-old children. The subjects were from the following social classes:

40 upper middle class; parents, college educated; father, professional, executive or manager.

42 upper lower class; parents, high school educated; father, skilled blue collar.

41 Aid to Dependent Children; father-absent homes; mothers on welfare.

Subjects with and without their children were observed in a variety of circumstances. They were given the Wetzel Adult Intelligence Scale verbal test; biographical data was taken; they were asked to relate what they would do and tell their child before the first day of school; how they taught their children specified tasks and their attitudes towards education were observed. The children took the Stanford-Binet and the Sigel Conceptual Sorting Task, A Vygotsky type block problem which they were taught to sort by their mothers.

Findings: (a) Mothers who tend to be high in status-normative orientation would tend to be low in personal-subjective and/or cognitive-rational orientation. A significant negative correlation, $r = -.61$, $p < .01$. The material for this analysis came from the mothers' statements about how the child should act in school the first day and with his peers. It reflects the contrast between mothers who issue commands respecting status and norms without elaborating why this is done on rational grounds and mothers who support their statements with an explanation that is specific to the person and the situation. (b) Mothers high in the use of imperatives in the above mentioned situations would tend to be low in giving instructions that explain why, when and how something should be done in a more elaborated manner than an imperative statement. Relationship between these two was negative and significantly correlated, $r = -.23$, $p < .01$. (c) "Status-orientation and imperative behavior were significantly related, $r = .26$, $p < .01$. The correlation between person and/or rational-orientation and instructive behavior fell just short of statistically significant, $p < .10$, $r = .13$." (d) Mothers tending to use status-orientation and commands rather than instructions would not have developed an elaborated linguistic code, whereas person-oriented and cognitive-rational oriented mothers would. Elaborated linguistic code was measured by mean sentence length, mean preverb length, verb elaboration, syntactic structure elaboration, and abstractions in verbs and nouns used. All these measures were significantly different in the predicted direction at $p < .05$ or $p < .01$ except for one measure for each group. Verb elaboration was not

significantly different for status-oriented and person-oriented, and abstractions did not distinguish between imperative and instructive statements. (e) The children of mothers who predominantly used status-normative control techniques performed at a lower level than the children of mothers using person-oriented cognitive-rational techniques on the Stanford-Binet and the Sigel Conceptual Sorting Task, a concept attainment block sorting task. Six of the seven correlations of this measure were significant at $p<.05$ or $p<.01$. "Mothers high in personal-subjective or cognitive-rational orientation and mothers high in instructive responses tended to have children who were successful on the cognitive tasks." (f) Mothers' language styles were significantly related to the children's performance on various cognitive measures: high language elaboration associated with superior cognitive performance, and restricted language style associated with unsuccessful children, significant at $p<.01$ and $p<.05$. (g) "Types of family control techniques and mothers' language styles" is related to socioeconomic status--elaborated language styles and personal-subjective and/or cognitive-rational control found in middle class mothers and imperative statements oriented to status-normative control found in lower class mothers.

Conclusions: Considering the association found between maternal language styles and cognitive ability (which does influence the child's success in school), preschool intervention programs must also work with the mothers of children and attempt to reshape their language patterns and the attitudinal biases expressed in them.

2.4.3 MEASUREMENTS AND TECHNIQUES

2.4.3.1 Flavell, J. H. The ontogenetic development of verbal communication skills. Unpublished Final Progress Report, National Institute of Mental Health Grant Number M-2267, University of Rochester, June 1958 to May 1961.

This final progress report concerns a series of studies aimed at describing the developmental nature of verbal communication skills. Only one section, that done by Patricia T. Botkin, deals with preschool children.

STUDY II: Experimenter was Patricia T. Botkin.

Problem: ". . .to develop tasks which would assess role-discrimination abilities..but which would be simple enough to be suitable for administration to very young children" (page 12). "Role-discrimination" defined operationally is the child's response to and recognition of another as different

from himself.
Method: Subjects: A. 40 preschool children, 10 each of four ages (3, 4, 5, 6). B. 20 children, 10 each of 3- and 5-year-olds.
Design: There were two studies, the second being similar to the first except in the smaller number of subjects and revision of three of the original six tasks. Independent variable is age; dependent variable is performance on tasks especially constructed for the study. No statistics were given, but developmental curves were discussed (although the mechanics of them were not described). Task: the child is to select an object appropriate for the adult opposite him or is to verbally respond to or place an object in a way that the adult would do (i.e., from the adult's viewpoint).
Findings: "All of the tasks showed the expected increase in correct response with age, either in their original form, in the revised, or both" (page 13).
Conclusions: 1. Role-attribute discrimination is a function of development. 2. It is not surprising that the younger children who are still ego-centrically oriented, had trouble with the task, since 3. the tasks require that one must ". . .intuit something about the inner state of another at the same time sic that one is being stimulated by one's own inner state" (page 13).

2.4.4 INTERVENTION

2.4.4.1 Blank, M., and Bridger, W. H. Cross-modal transfer in nursery school children. Journal of Comparative and Physiological Psychology, 58, 277-282.

Hypothesis: If the ability to make cross-modal transfers is dependent upon language as a mediator, children of different ages and at different stages of language learning should differ in their performance on cross-modal transfer tasks.
Methods: Subjects: 64 children from a single nursery school, divided into age groups (3, 4, and 5 years) with unequal numbers and sex distribution.
Design: two experiments are reported in which the same subjects were used; the first was designed to test cross-modal equivalence (the same stimuli presented in two modalities, visual and haptic); and the second, to test cross-modal concepts (the same concept; e.g., "two," presented in different modalities with different stimuli; e.g., two sounds and two lights).

Independent variables: age (3, 4, 5); amount of help given that concerned the transfer to be made (the subjects were informed of the equivalence of the concept, uninformed, or cued). Dependent variable: subject's choice of discriminanda, as presented by the experimenter.
Results: Experiment 1: A chi-square test indicated that 4- and 5-year-olds performed significantly better than chance ($p < .001$) on cross-modal equivalence problems. The percentage of correct choices increased with age. Even if they had made a correct choice, few children could verbalize the reason for the choice. Experiment 2: The children in the informed group did "better" than the others.
Conclusions: Success with trials of cross-modal equivalence depends on age but not on verbalization. For success with cross-modal concepts, language, though not sufficient, is necessary.

2.4.4.2 Kendler, H. H., and Kendler, T. S. Effects of verbalization on reversal shifts in children. Science, 1961, 134, 1619-1620.

The Kendlers are interested in the behavioral analysis of processes that mediate between the external stimulus and overt response. The method they use for such an analysis is the reversal-non-reversal shift technique (for clarification, see Kendler et al., Methodological Paradigm).

The present experiment is built on previous research (Kendler and Kendler, 1959; Kendler, Kendler, and Wells, 1960; Kendler, Kendler, and Learnard, 1960) which indicates that, when subject is not required to give relevant verbalizations, older children perform reversal shifts more quickly than younger children. The present experimental problem is whether subject's naming of stimuli will influence his performance and, if so, whether there is a different influence on groups of 4- and 7-year-olds.

Two independent variables, one assigned and one manipulable, were used. The age variable was represented by two groups of children, 48 from nursery school (mean chronological age was 4 years 6 months) and 48 from second grade (mean chronological age was 7 years 6 months). (No further information about the subjects is given). The other variable was the type of verbalization that subject was instructed to give during the initial task. To implement this treatment, the children within each age group were randomly assigned to three groups: in the first, the verbalization consisted of a label that was relevent to the dimension reinforced on the second task; in the second, the label was irrelevant; in the third, no instructions for labeling were given.

The dependent variable was the rapidity with which the second task was learned; this was defined as the number of trials to criterion.

All children learned two series of discriminations to a criterion of nine out of 10 successive correct responses. The pair of two-dimensional discriminanda varied simultaneously on two dimensions: brightness (black, white) and absolute size (1 inch, 3 inches). A pair was displayed simultaneously by a portable discrimination apparatus. Subject indicated his choice by pressing a lever, and, if correct, was reinforced with a marble. (No further details about the apparatus are given).

In the initial discrimination, one stimulus pair was presented; thus redundant cues, (e.g., the 3-inch black stimulus) were reinforced. In the second discrimination, two stimulus pairs were presented in "random alternation" (page 1619). Position preferences were controlled. These pairs were either the same as in the initial discrimination but with the reinforcement pattern reversed or another that, like the rest of the pairs, differed simultaneously on two dimensions. The opposite value of an initially reinforced cue (e.g., white) was reinforced. If, with this pattern of reinforcement, the subject learned the second task to criterion, he was said to have made a reversal shift. Because of the redundancy of cues in the initial discrimination, labels appropriate to it could be descriptive either of relevant or irrelevant dimensions in the second discrimination. (Illustration of verbalization of the irrelevant dimensions: subject says "large.")

Although it is not unequivocally reported, all statistical results could be based on a two-way analysis of variance, whose effects were age (two levels) and type of verbalization (three levels). For the combined age groups, the difference among the types of verbalization was significant ($p < .005$). The Kendlers report that the shift was facilitated by relevant labels and retarded by irrelevant ones and suggest that this finding supports the possibility of verbal mediation. The statistical interaction between age and type of verbalization was not significant. In the no-verbalization groups, there was a significant difference ($p < .05$) between the 4-and 7-year-olds in the number of trials to criterion. The 4-year-olds required more trials than the 7-year-olds. For 7-year-olds, the group with relevant verbalization performed no better than the group with no verbalization. For 4-year-olds, relevant verbalization had a small (but statistically insignificant) positive influence. The Kendlers suggest that the younger children are less likely to make covert mediating responses that facilitate reversal shifts.

2.4.4.3 McConnell, O. L. Perceptual versus verbal mediation in the concept learning of children. Child Development, 1964, 35, 1372-138

Hypotheses: A. Perceptual mediating responses influence concept learning: when a perceptual dimension in a prior learning task (1) is relevant to the subsequent conceptual task, learning will be facilitated even if the rewarded value is changed (reversal shift); (2) is irrelevant, learning will be impeded (irrelevant means non-reversal shift). B. Concept learning in younger children is more affected by perception than it is in older children: the effects in Hypothesis A will be stronger in the younger group. C. If perceptual and verbal dimensions are both relevant to a learning situation, the younger children will be more influenced by the perceptual mediators and the older, by the verbal mediators.
Method: Subjects were 50 nursery-school children (mean age 3.8 years) and 75 second graders (mean age 8.0 years). Matched on sex and IQ. All children from upper middle class.
Design: independent variables: age of child (3.8 or 8.0); type of stimulus (perceptual array only or this plus conflicting verbalization); type of object arrangement in the perceptual array (size, randomness, brightness). Dependent variable: response under two conditions of concept learning (reversal and nonreversal shift). Controls were those presented with a random perceptual arrangement. Learning apparatus, designed by Robinson, 1964: clown's face; response is made through physical manipulations; reinforcement is through flash of light and food.
Statistics: for Hypothesis A and Hypothesis B, 3-by-2 factorial analysis of varience with age level and type of stimulus. For Hypothesis C, re perceptual-verbal conflict, used nonparametic Mann-Whitney U Test with all three of the independent variables.
Results: Hypothesis A is supported: the effect of object arrangement is significant at the $p<.05$ level and the interaction between age and object arrangement is not significant. Hypothesis B tends to be supported: there is an overall difference in age level ($p<.025$) but not always in the predicted direction. Hypothesis C has parts that are supported: in the perceptual-verbal conflict task, there is a highly significant difference between the younger and older children ($p<.001$), and the older learned faster than the controls ($p<.01$), and the nursery school children tended to be slower than the controls ($p<.10$).
Conclusions: In young children, perceptual as well as verbal mediating responses occur which "should" obey the same principles of learning. ("Perceptual" and "verbal" are distinguished by the method of presentation.) The relevance of each to different stages

of development (and a "transitional" stage) is not straightforwardly clear from this experiment and needs to be investigated further. There probably is not one point on the developmental continuum where a change from a single-unit mode to a mediational mode of responding occurs.

2.4.4.4 Rheingold, H. L., Gewirtz, J. L., and Ross, H. W. Social conditioning of vocalizations in the infant. Journal of Comparative Physiological Psychology, 1959, 52, 68-73. Also in readings in Child Development and Personality, Mussen, Conger, Kagen (editors), New York: Harper and Row, 1965, 101-111.

Hypothesis: Some responses the adult makes to the child function as a reinforcer to develop and maintain social responsiveness in the child. Vocalizations seem to be an index of the child's whole social response. Operational formulation: Vocalization in infants can be conditioned by reinforcement from social acts of adults.
Methods: Subjects were 21 3-month-old infants, who had been residents since birth in a Catholic institution in Washington, D. C., where there were multiple caretakers. All children in the sample were healthy and were similar in terms of maturation and rate of vocalization. The sexes were equally represented.
Design: Two experiments were conducted, the second being a replication of the first with different subjects and experimenters to test for an experimenter effect. Independent variable: social conditioning. "The reinforcing stimulus was a complex of social acts which resembled those an attentive adult might naturally make when a child vocalizes. If temporal continuity between the infant's vocalization and the reinforcing stimulus, which follows it, brings about an increase in the vocalizations, conditioning may be said to have occurred" (page 101). Dependent variable: the number of vocalizations the subject gave in a 3-minute period. Vocalizations were considered to be" . . .every discrete voiced sound produced by subject" (page 103) that was not a sound characteristically made by young infants, such as a cough, or emotional behavior, such as a cry. Treatment: Vocalizations were collected for all subject's at three different periods during the day when subject was awake, alert, and content. The experimenter aimed at getting (but achieved only 80 per cent of the time) nine samples of vocalizations for each subject on each of the 6 days, during which there were three experimental conditions: Baseline (days 1 and 2): ". . .Experimenter leaned over the crib with her face about 15 inches above subject's and looked at him with an expressionless face, while observer tallied vocalizations, out of subject's sight. The experimenter moved her head as necessary to remain in subjects's line of vision," (page 102).

Conditioning (days 3 and 4): "...experimenter again leaned over the crib with an expressionless face except that when subject vocalized, experimenter made an immediate response and then resumed the expressionless face until the next vocalization." (page 102). Extinction (days 5 and 6): "...were the same as days 1 and 2; experimenter leaned over the crib with an expressionless face and made no response to subject's vocalizations" (page 103). Statistics for the study were derived from a 3-way ANOVA (Lindquist's type VI design) and subsequent T-tests in such a way that the individual differences among subjects were held constant and the effects of experiment 1 versus 2 (experimenter effect), the conditions (baseline, conditioning, and extinction) and of the days within the conditions (day 1 versus 2, 3 versus 4, 5 versus 6) could be tested. Results: There were no significant differences between groups on the two experiments. There was a difference in the effect of the three 2-day experimental conditions ($p < .001$) and in the effect of successive days within the conditions ($p < .001$). The effect of interaction was insignificant. Six T-tests on the significant effects for the pooled sample indicate "there was no statistically significant difference in the mean number of vocalizations given in a 3-minute period from the first to the second baseline day" ($T = 0.87$, $p > .30$ in 2-tailed test), but vocalization increased on each of the two following days of conditioning (1-tailed T-test; p's $< .01$), decreased on the extinction days (p's $< .0025, .10$). There was no statistical difference (2-tailed T-test, $p > .20$) between the second extinction day and second baseline day. The amount of change during conditioning varied greatly for the individual subject but, in general, increased 86 percent. In both experiments, there was an identical order in the amount of emotional behavior: the greatest amount occurred during extinction. Not all subjects increased or decreased vocalizations significantly with the different conditions (Mann-Whiteney Test, .05 level). Subjects tended to keep the same relative rate of vocalization relative to the rest of the group under baseline conditions and conditioning (rank order coefficient of correlation = .66, $p < .0005$). Sex differences were not reliable. Conclusions: The results suggest that "1. Infants' vocal behavior in a social situation can be brought under experimental control; that is, it appears to be conditionable. 2. A social event composed of an everyday complex of acts, performed by an adult who is not a caretaker, can function as a reinforcing stimulus. 3. The incidence of such behavior can be very quickly modified in as young an organism as the 3-month old infant" (page 108).

2.4.4.5 Sherman, J. A. Modification of nonverbal behavior through reinforcement of related verbal behavior. Child Development, 1964, 35, 717-723.

Purpose: The author's theoretical interest is possible generalization to nonverbal behavior following verbal conditioning; he wants to investigate "the effects of approval and candy following children's verbal statements about a play situation on subsequent nonverbal behavior in the same play situation."
Operational Hypothesis: The statements a child makes while playing with toys after he has talked with a mechanized puppet, which reinforced the child's statements about one of the two toys with candy and approval, are different from statements made during play before the talk with the puppet.
Methods: Subjects were 20 children between 4.2 and 6.8 years, randomly drawn from a day care center in Seattle, Washington; all from low-income families.
Design: There are two steps to the study. The independent variable throughout is verbal conditioning. Dependent variables: Step 1: the extent of verbal conditioning: comparison of subject's statements about the reinforced and neutral toys in regard to the initial latency (that time between the end of the puppet's comment and the beginning of the child's) and number of words per statement. Step 2: influence of verbal on nonverbal behavior: comparisons of the number of lever depressions and the time spent attending the reinforced toy before and after verbal conditioning session.
Statistics: Wilcoxin matched-pairs signed rank test; the "pair" for Step 1 and Step 2 seems to be two conditions for each subject: the reinforced and neutral toys; the before and after play session.
Apparatus: Toys to measure amount of play: two electrically operated toys activated by pressing a bar. Operant conditioning unit: mechanized puppet (Baer, 1962) which could give social or concrete reinforcements; under experimenter's control. Laboratory: mobile trailer outfitted as complete lab.
Findings: Statements about the reinforced toy had significantly shorter latencies than statements about neutral toys (1-tailed T-test, $p < .005$). Between the first and second play sessions, there was a significant increase in the number of lever depressions of the reinforced toy (1-tailed T-test $p < .05$), and in the time the child attended to that toy (1-tailed T-test, $p < .05$). However, 11 subjects were the primary contributors to the change; eight showed little difference between the two play sessions; one showed change in the opposite direction.
Conclusions: Approval and candy served as a positive reinforcer of subject's verbal statements about the reinforced toy and this had significant but limited effects on increasing the amount of subsequent play with that toy.

2.4.4.6 Weissberg, P. Social and nonsocial conditioning of infant vocalizations. Child Development, 1963, 34, 377-388.

Problem: Weissberg's experiment was designed to clarify and eliminate alternative explanations of infants' increased rate of vocalization following social stimulation as reported by Rhinegold and others (1959). (It deals with operant conditioning.) Experimental Hypotheses: 1. Increases in infants' vocalizations can be brought about by social reinforcement. Alternate Hypotheses: 2. The presence of an adult acts as a releaser--a stimulus rather than a reinforcement for infant vocalization. 3. Physical events serve as a reinforcement.

Method: Subjects--thirty-three 3-month-old full term infants of both sexes (physically healthy). All from an urban Catholic orphan home with multiple caretakers. Design--one binomal test and three 3-way analyses of variance using the following variables: (a) rate of vocalization for each infant; (b) session (four periods of 2 days each): Control-No experimenter present, Control-Experimenter present, Experimental, Extinction; (c) type of experimental treatment: No experimenter; experimenter present; noncontingent social stimulation; noncontingent nonsocial stimulation; contingent social stimulation; and contingent nonsocial stimulation. Dependent: rate of vocalization. There was random assignment of the subjects to groups, which differed little on the variables of age, birth- weight, preexperimental weight, length of time in institution. Contingent social stimulation, experimenter present, and contingent nonsocial stimulation are the treatments which become the operational formulations of the hypotheses above. The other types of experimental treatment served as controls. The session in which no experimenter was present for any group let each subject serve as his own control for rate of vocalization.

Findings: Relevent to Hypothesis 1. An ANOVA and subsequent T-test of the two control sessions showed that the mean vocalization rates of days 2 to 4 were significantly different from day 1 but not from each other ($p < .02$). 2. At the first introduction of experimenter, the rate of vocalization increased somewhat ($p < .25$) but declined on the next day; the overall pattern differed little (qualitative judgment?) from the rate of subjects with no experimenter present. 3. In an ANOVA of Control-experimenter-present and Experimental treatments, the only significant effect was the Day Group Interaction ($p < .01$); in an ANOVA of Experimental and Extinction conditions, there was no significant difference among groups, although all subjects in the contingent social stimulation group maintained higher vocalization rates than other subjects.

Conclusions: "The results indicated that, after habituating to an unfamiliar setting devoid of humans, [Finding 1] the subject's rate of vocalization did not reliably increase when an unresponding adult was introduced and made part of this environment. [Finding 2] The immobile adult was evidently not a social releaser (or discriminative stimulus) for social behavior. Taking the vocalization rate in the presence of the unresponsive adult as the operant level, it was found that the behavior could be operantly conditioned by social consequences (the adult briefly touched subject's chin and simultaneously smiled and talked to him). [Finding 3] Extinction operations subsequently reduced the rate but not to baseline performance. Conditions other than social reinforcement. . .(e.g., presenting the reinforcing stimulus noncontingent upon vocalizing) did not seem to control infant behavior" (pages 387-388).

2.4.5 PATHOLOGY

2.4.5.1 Silver, A. A., and Hagin, R. A. Developmental language disability simulating mental retardation. Journal of the American Academy of Child Psychiatry, 1965, 4, 485-494.

In this article, three case histories are given to illustrate developmental language disorders, the difficulty being in spoken language (subjects followed from about age 3 for several years, one to age 18).
Problem: 5% to 15% of the American grade school population (boys outnumbering girls three to one, no demonstrable evidence of structural damage to central or peripheral nervous system) have difficulty dealing with stimuli on symbolic level. What's going on with them?
Probable Contributing Factors--the population above seems to have the following in common (based on various authors' works): 1. strong family history of language disturbance; 2. neurophysiological organization (and cerebral dominance) appearing not to be fully established; 3. specific perceptual problems in more than one perceptual area (e.g., orientation in space and time). It is the pattern of perceptual deficit that appears to determine the particular symptomatology (e.g., the child whose defects are primarily auditory will have trouble with spoken language). Although the presenting symptoms--the inability to deal with symbols, etc.--may appear similar to mental retardation because new learning cannot be integrated, the prognosis is much more hopeful.

2.4.8 GENERAL

2.4.8.1 Fahey, G. L. The questioning activity of children. Journal of Genetic Psychology, 1942, 60, 337-357.

Fahey summarizes the literature from 1879 to 1939 that deals with the questioning activity of children (preschool and school age). The theoretical definition of "question" has varied but has usually included the questionner's confusion and realization of incomplete knowledge. Concerns about the pedagogical importance of questions have been expressed, and studies of school-age children indicate their questions are greatly influenced by experience at school. Studies each reporting the questioning activity of one or two young children have yielded norms which appear to be strongly influenced by chance observations, the environment of the child, or the order in which wishes develop. It is questionable whether classification via the order of appearance of question words or forms is adequate: it may measure only acquisition of form, which may develop separately from the cognition which dictates the content of the question. Studies which classified questions via the objects asked about generally have been concerned with curriculum development. A few studies of a statistical nature are based on the classification of questions in terms of the thought of the questionner and follow the scheme of functional analysis developed by Piaget in the Language and Thought of the Child.

2.6
ALL

2.6.1 NORMATIVE

2.6.1.1 De Hirsch, K., Jansky, J. J., Langford, W. S. The oral language performance of premature children and controls. Journal of Speech and Hearing Disorders, 1964, 29, 60-69.

Hypotheses: A. Premature children are inferior to normally born children in oral language performance. B. There are measures which will discriminate between premature and full-term children.
Methods: Subjects: There were 106 children. A group of full-term and premature children were distinguished by their age at birth and body weight. The groups were comparable in age (mean was 5.8 years), race, sex, and educational background of parents. All children selected had scored within one standard deviation of the mean on an IQ test and had no gross emotional or neural disturbance.
Procedures: 15 measures of receptive and expressive language (i.e., that heard and that produced) that had been found clinically useful to evaluate the language maturation of children were used: Tapped Patterns (Hardy, 1962), Auditory Memory Span (Birch and Matthews, 1951), Auditory Discrimination (Wepman, 1958), Word Recognition (Peabody Picture Vocabulary Test), Language Comprehension (response to story telling), Consonant Articulation (The Developmental Articulation Test, Hejna, 1955), Resistance to Articulatory Disintegration Word Finding (evaluating competence in evoking familiar words), Story Telling, Sentence Development, Number of Words, Mean length of the five longest utterances, Sentence Elaboration (ratio of complex or compound sentences to number of utterances), Number of Grammatical Errors, Definitions (from Stanford-Binet), and Categories (production of class names).
Design: Repeated measurements on two groups of children who were matched on several major variables, leaving major difference between groups as that between premature and full-term children assigned by circumstances of birth.
Statistics: X^2 "corrected for continuity"; T-test when possible.

Findings: Premature are not significantly superior to full-term on any measure; on seven of the measures, the premature are significantly inferior to the full-term children, (at or greater than the $p < .05$ significance level). The tests that discriminate in such a way are Language Comprehension, Word Finding, Number of Words, Mean Length of Longest Utterance, Degree of Sentence Elaboration, Word Definitions, and Tapped Patterns.
Conclusions: The results of the tests which significantly differentiate between full-term and premature children uphold the hypothesis that premature are inferior in oral language performance. Because of the restrictions of the sample in terms of intelligence, and SES background, the difference cannot be attributed to global brain damage, emotional disturbance, or deprived background (hypotheses offered by other investigators). The tests that differentiate between premature and full-term children are those related to a high degree of linguistic maturity.

2.6.1.2 Weir, R. H. Language in the crib, The Hague: Mouton, 216 pages.

This book is a case study of the monologues of the author's 2 1/2-year-old son. Data analysis for both the form and the content of the utterances follows the procedures of linguists interested in the hierarchical and generative structure of language.
Method: The subject of this study is one American boy who is in the process of acquiring language; he is followed for a period of 2 months (chronological age 2.4 to 2.6). He is white, has well-educated parents and no older siblings, and hears only English spoken around him, although some members of his household have foreign accents. The primary data are tape recordings of subject's monologues when he was in his crib (presumably after having been put to bed for the night) and alone in his room. A microphone was attached to his crib with controls outside the room, an arrangement which was feasible because of an intercommunication hook-up throughout the house. A session of recording was begun when subject began his monologues, but there is no report of the exact time or the intervals at which recordings were made. No detailed records were kept on subject's earlier speech development, although it had been noticed that babbling during the day had stopped several months previously. Data collection stopped because, after a family vacation during which subject shared a room with his younger brother, the presleep monologues never were resumed. Secondary data, used at times in the clarification and interpretation of the presleep monologues, come from the author's

(the mother's) detailed knowledge of the environment and experiences of the child and the characteristics of his speech during the day. Weir adapted schemes built for the analysis of adult language to use with child speech. She analyzed the data on several levels, each level representing a particular unit of language. The analysis of the system of speech sounds (phonology) was patterned after the work of Jakobson and Halle. Words, or the smallest units of meaning (morphology), were analyzed in terms of the frequency of occurrence of parts of speech. For sequences of words that belonged together (the child's counterpart of a sentence), Weir created a way of describing the constituents which appears to be derived from the postulates of transformational grammar. A frequency count was made for vocabulary. Jakobson's analysis of verbal functions was applied to groups of sentences. Except for frequency counts, the analyses were of purely qualitative natures within established schemes.
Findings: General more-or-less type comparisons are made between items within a category (e.g., sound system) or between day and presleep speech. Since there are no summary statistics to report, only a very general impression of the findings can be given here. In the form of the child's speech, the phonology and morphology (sound system and parts of speech) differed little between day and presleep. Subject's vocabulary and topics were more restricted in the presleep period. During the day, but not at night, subject's syntax appeared to be more mature than his morphology (for example, the grammar was used correctly, but there were mistakes with word endings). The content of the child's monologues at bedtime differed from his speech during the day, which was communicative and referred to objects. His presleep speech was largely sound play and grammatical practice.
Conclusions: Weir gives a detailed summary of what the child has not yet learned (relative to the structure of adult language) in phonology, morphology, and syntax (compare pages 142-144). She finds that many groups of the child's utterances have a circular construction, ending where they began; she interprets this in terms of the practice and play of the child. Weir mentions the work of Freud, Piaget, Vygotsky, and Wallon in terms of theoretical significance ascribed to the speech of the presleep period. For instance, according to Vygotsky, this speech would represent the speech that would later be internalized and resemble thought.

2.6.2 ENVIRONMENT

2.6.2.1 Hakes, D. T. Psychological aspects of bilingualism. The Modern Language Journal, 1965, 49, 220-226. Also in Saporta and Bastian (editors), Psycholinguistics, New York: Rinehart & Winston, Inc. 1961.

Hakes summarizes the norms of language development as found in studies of babbling, vocabulary, and psycholinguistic behavior, and emphasizes the long time consumed by the acquisition of language. He discusses the probable (but theoretical) effects of a bilingual environment on these norms. Variables in learning the second language might be the degree to which the first language had been mastered, the similarity to the situations in which the languages were learned and used, the age of the learner, and his socioeconomic background. Problems peculiar to second language learning might be the recovery of sounds used in the babbling era but not in the first language, the learning of new words for the same referent (the necessity of acquiring a second response to the same stimulus, a negative transfer situation), the lack of synonymity between words in the two languages, different grammars, and many social aspects.

2.6.2.2 Provence, S., and Lipton, R. Infants in institutions: A comparison of their development with family-reared infants during the first year of life. New York: International Universities Press, 1962. 184 pages.

This short book reports the empirical study of infants on the basis of which Provence and Lipton generated ideas relevant to the following problems: in what ways to organically intact institution-reared and family-reared children differ? Why do they differ?
Subjects: There were 150 infants of less than a year old, 75 reared at home and 75 in an institution. The family-reared children were seen by Provence and Lipton in connection with other studies. The institution-reared children were drawn from the population of one institution over a 5-year period; only those children born at full term, admitted to the institution before 3 weeks of age, and who were organically intact were included.
Design: The design of the study is longitudinal, with repeated examinations of the same group of children. The independent variables considered were aspects of the multi-dimensional concept "maternal deprivation." In addition to individual constitutional differences among infants and the quality of the environment (eight aspects of institutional and home environments), the study was concerned with discovering which aspects of maternal care functioned as major variables. The dependent variables were components of the syndrome of behaviors previously called "hospitalism." The development of the following behaviors was studied: motor behavior; language; reaction to people; reaction to inanimate objects; discovery of the body. Assessments of the postulated dependent and independent variables were made by observation. In addition, for the dependent variables, the following measures were used: infant tests (Gesell Developmental Examination and Hetzer-Wolf

Baby Test from the Viennese Scale), physical and neurological examinations, and measurements of height, weight, etc. The infant tests were used primarily as controlled settings for observations; as with all other observations, the interjudge reliability is reported to be high. (The vagueness in these descriptions reflects the nonquantitative nature of the study and report).

Statistics: Although statistical correlations could have been performed for the data, they were not because the result would merely have supported the usual finding that, for institutionalized infants, there is a progressive decline in scores on infant tests. Therefore, the investigators emphasized those differences between family-reared and institution-reared children which were not quantifiable. A qualitative description emerges from this work, which is the source of ideas that can be formulated into testable hypotheses.

Findings: In brief, the data in all areas of development studied showed that there was little difference between institution-reared and family-reared infants in the first few months. There was considerable variability in the amount of time before any real difference appeared: in motor development, retardation was noticeable among the institutionally reared children after 3 to 4 weeks; in reactions to people, a difference was not noticed until after 3 months. After the initial period of no difference, increasing differences between the two groups of children occurred in the form of the delay of behavioral onsets (e.g., in control of the neck when being pulled to a sitting position), of unusual behavior (e.g., rocking), and of a lag between the maturation of a skill and the use of it (e.g., prehension). A followup of the children (still under age 5) that had been placed in foster homes indicated general improvement, but residual impairment in the capacity to form emotional relationships, in control in modulation of impulses, and in certain aspects of cognitive development.

Conclusions: Provence and Lipton suggest numerous facets of maternal care that are important for the proper development of the infant: bodily stimulation, unintentional as well as intentional communication of ideas and feelings, specific opportunities in which to use skills that have matured, meaningful attachment to another person, and the general responsiveness of the environment.

2.6.3 MEASUREMENT AND TECHNIQUES

2.6.3.1 Berko, J., and Brown, R. W. Psycholinguistic research methods. In P. H. Mussen (Editor), Handbook of research methods in child development. New York: John Wiley and Sons, Inc., 1960. Pages 517-557.

Overview of methods used to study the development of language systems; i.e., the regularities of phonology, morphology, syntax, and reference. Use of linguistics enables the psychologist to structure verbal behavior and see the range and variation more easily. For good exposition of linguistic systems, see pages 518-521 (General); 521-526 (Phonology); 531-532 (Morphology); 548-549 (Syntax).
Basic question investigated: Does the child know the regularities of the language, or is he merely parroting? (Answer to this is clear only when the child says something new or applies the utterances to a new referent in conformance to linguistic rules. Difficulty: in order to know whether the child has formed implicit rules, one needs to know the sample of speech to which the child has been exposed.)
Methods of Investigation: (1) Nonexperimental: studies of continual surveillance--trained parents:
a. observation and recording of child language by persons trained to discriminate forms, sounds of speech;
b. clarification of what child knows by informal questionning.
(2) Experimental:
a. tests for perceptual versus cognitive groupings of words, etc. (does child associate "black" and "dog" or "dog" and "puppy");
b. tests requiring identification of new instances (e.g., making plural for a nonsense word);
c. verbal conditioning via EDR (electrodermal response).

2.6.6 PHYSIOLOGY

2.6.6.1 Boone, D. R., Laterality, dominance, and language. Journal of the Kansas Medical Society, 1965. 66, 132-135.

Laterality (handedness): While some children demonstrate hand preference independent of training, some are influenced greatly by training or an accident. Norms: 4 years: unilateral hand preference appears for first time; 7 years: child is again competent bilaterally; 8 years: shows unilateral hand preference that persists. Eyedness and footedness have little relation to lateral

dominance and language. Discrimination between "left" and "right" generally does not clear up until age 10--when handedness is already established--and lack of this discrimination appears to be involved in reading difficulties (b's and d's). Establishment of hand preference seems to aid this discrimination.

Dominance: Handedness does not contribute to the establishment of central dominance (i.e., hemisphere of brain)--despite tradition to the contrary. Language is generally established in the left hemisphere, regardless of handedness (evidence from aphasia). Children with cerebral damage before age 10 generally show rapid and complete recovery of language (so dominance is not yet completely fixed.)

2.6.8 GENERAL

2.6.8.1 Cazden, C. B. Some implications of research in language development for preschool practice and research. Paper prepared for the Social Science Research Council Conference on Preschool Education, Chicago, February 7-9, 1966.

This is a summary and discussion of research in language development and a careful approach to possible prescriptions. It is difficult to derive prescriptions for practice because: 1. the role the environment plays in the acquisition of language is far from fully understood, and 2. there is no necessary relation between developmental finding--"nonnatural" treatments like Bereiter's which draw on knowledge outside the field of developmental research may influence language development as well as the institutionalization of any "natural" sequence found in middle class homes, etc.
The following areas of research are discussed:

Acquisition of the Structure of Language (grammar)--work of Brown and Cazden.

Vocabulary Studies--e.g., work of Stodolsky.

Acquisition of the Multiple Functions of Language--the intrapersonal as well as the interpersonal uses, the shift from "associative" to "cognitive" levels.

The acquisition of the standard dialect and the replacing of nonverbal behavior with words.

2.6.8.2 Church, J. Language in childhood. Childhood Education, 1962, 39, 19-22.

The discussion covers the following questions (page 19):

"How does the child learn language?"

"What is it that the child learns when he learns language?"
"What difference does it make to the child that he learns language?"

Church's article, which is simply but clearly written, integrates much normative material with theoretical questions (including the positive and negative contributions of learning theory), places the theoretical questions within a meaningful context, and focuses the inquiry.

2.6.8.3 Skinner, B. F. Verbal behavior. New York: Appleton-Century-Crofts, Inc., 1957. 470 pages.

"Verbal behavior" is the term which Skinner applies to that human behavior which, through the mediation of other people, results in indirect influence on the environment. He uses the term to distinguish his interest in an individual's repertoire of verbal responses from other interests; e.g. in the practices of a linguistic community or in purely vocal behavior. Skinner does not hesitate to say that his remarks about verbal behavior are extrapolations from the empirical study of operant conditioning in laboratory animals; he does not offer further empirical data because he feels that the basic processes and relations in learning are fairly well understood and vary little among species.

The unit of verbal behavior which is studied is the "verbal operant," a response of an individual which indirectly influences the environment and is functionally related to the stimulus; it may be of any size as long as it is under unitary functional control. The categories by which Skinner describes verbal behavior are defined in terms of the controlling relationship the stimulus has to the operant. Thus tacts, mands, echoic, textual, intraverbal, and autoclitic operants define functions of verbal behavior which roughly correspond to the more traditional terms of reference, imperatives, mediation, and connective syntax. A tact, for instance, denotes"...a response of given form evoked...by a particular object or event or property of an object or event" (page 82). A mand, such as "Candy!", is a ". . . type of verbal operant in which a response of given form is characteristically followed by a given consequence in a verbal community" (page 35).

Skinner's main emphasis is the analysis of types of verbal operants, an analysis which allows him to fit (or, perhaps, force) verbal behavior into the operant conditioning paradigm. In such a framework, stimulus, response, and reinforcement ". . .are contingent upon each other . . . in the following way: the stimulus, acting prior to the emission of the response, sets the occasion upon which

the response is likely to be reinforced. Under this contingency, through a process of operant discrimination, the stimulus becomes the occasion upon which the response is likely to be emitted" (page 81).

2.6.8.4 Wolski, W. Some variables in speech and language development in normal children. Medical Times (New York), 1964, 92, 868-871.

This is a summary article for doctors discussing the effects of sex, socioeconomic status, race, bilingualism, multiple birth, and institutionalization on language development in normal children. No applications to medical practice are suggested. Most of his references are to psychological investigations before 1960.

2.6.8.5 Yamamoto, K. Bilingualism: A brief review. Mental Hygiene, 1964, 48, 468-477.

In this article, "bilingualism" refers to the situation in which one language is used at school and another for communication within the home; "bilingualism" in other contexts may refer to the use of two languages interchangeably. The article is a review of papers dealing with the relationship between bilingualism and verbal intelligence when the languages involved are English and Yiddish, Gaelic, Italian, Chinese, or Spanish.