INFORMATION TO USERS

This material was produced from a microfilm copy of the original document. While the most advanced technological means to photograph and reproduce this document have been used, the quality is heavily dependent upon the quality of the original submitted.

The following explanation of techniques is provided to help you understand markings or patterns which may appear on this reproduction.

1. The sign or "target" for pages apparently lacking from the document photographed is "Missing Page(s)". If it was possible to obtain the missing page(s) or section, they are spliced into the film along with adjacent pages. This may have necessitated cutting thru an image and duplicating adjacent pages to insure you complete continuity.

2. When an image on the film is obliterated with a large round black mark, it is an indication that the photographer suspected that the copy may have moved during exposure and thus cause a blurred image. You will find a good image of the page in the adjacent frame.

3. When a map, drawing or chart, etc., was part of the material being photographed the photographer followed a definite method in "sectioning" the material. It is customary to begin photoing at the upper left hand corner of a large sheet and to continue photoing from left to right in equal sections with a small overlap. If necessary, sectioning is continued again — beginning below the first row and continuing on until complete.

4. The majority of users indicate that the textual content is of greatest value, however, a somewhat higher quality reproduction could be made from "photographs" if essential to the understanding of the dissertation. Silver prints of "photographs" may be ordered at additional charge by writing the Order Department, giving the catalog number, title, author and specific pages you wish reproduced.

5. PLEASE NOTE: Some pages may have indistinct print. Filmed as received.

University Microfilms International
300 North Zeeb Road
Ann Arbor, Michigan 48106 USA
St John's Road, Tyler's Green
High Wycombe, Bucks, England HP10 8HR

77-13,852

HUBSCHMAN, Eva Weiss, 1920-
LANGUAGE DEVELOPMENT OF EARLY-INSTITUTIONALIZED DOWN'S SYNDROME SUBJECTS.

City University of New York, Ph.D., 1977
Education, language and languages

LANGUAGE DEVELOPMENT OF EARLY-INSTITUTIONALIZED DOWN'S SYNDROME SUBJECTS

by

Eva Hubschman

A dissertation submitted to the Graduate Faculty in Speech and Hearing Sciences in partial fulfillment of the requirements for the degree of Doctor of Philosophy, The City University of New York.

1976

This manuscript has been read and accepted for the Graduate Faculty in Speech and Hearing Sciences in satisfaction of the dissertation requirement for the degree of Doctor of Philosophy.

Jan 31, 1977
date

Bernard B. Schlanger
Chairman of Examining Committee

Jan 31, 1977
date

Executive Officer

Bernard B. Schlanger, Ph.D.

Norma S. Rees, Ph.D.

Harvey Halpern, Ph.D.

Supervisory Committee

The City University of New York

ABSTRACT

LANGUAGE DEVELOPMENT OF EARLY-INSTITUTIONALIZED DOWN'S SYNDROME SUBJECTS

by

Eva Hubschman

Adviser: Professor Bernard B. Schlanger

Spontaneous language samples of six Down's Syndrome subjects were recorded and analyzed according to the description of language development propounded by Roger Brown in A FIRST LANGUAGE-THE EARLY STAGES (1973). The subjects were residents of a state institution who had been placed before the age of four. Their present chronological ages range from five years ten months to twenty years eight months. The subjects were chosen because in addition to meeting other requirements, they had the most intelligible and best developed language available among the eligible residents. The Miller-Yoder Test of Grammatical Comprehension was also administered to provide an independent and objective evaluation of the subjects' comprehension of certain grammatical structures. The Leiter Performance Scale was administered to supplement the information provided by verbal intelligence tests administered by the Psychology Department.

Results supported the three hypotheses: A. The subjects, as a group, had a mean length of utterance not exceeding 2.0. They controlled proper word order, used the eight basic semantic relationships and the negative, interrogative and imperative modes. Thus, they had attained the linguistic skills typical of the Stage I child.

B. The subjects acquired functional control over some of the 14 grammatical morphemes, but only marginal use of others and practically no use of still others. Thus the major development of the Stage II of the normal child was not achieved. C. The subjects used some semantic relationships and structures such as embedded, complex and coordinated sentences which are not characteristic of the normal child at Stage I and Stage II. In some respects, therefore, the language development of these early-institutionalized Down's Syndrome subjects differed from that of the normal child contrary to the conclusions of some previous research. These results would suggest the need for some variability in Brown's Law of Cumulative Complexity. In addition, though previous research has often claimed that Down's Syndrome subjects are especially handicapped in the area of language development, administration of a performance scale did not produce significantly different results in terms of intelligence test scores from the standard intelligence tests which rely heavily on verbal comprehension and expression. The Miller-Yoder Test of Grammatical Comprehension identified overall group strengths and weaknesses on the items tested, but was not a reliable instrument for detecting the comprehension of individuals in this group.

ACKNOWLEDGMENTS

First and foremost I must thank my husband, Adolf Hubschman without whose unflagging encouragement this work would long since have been abandoned. It is largely due to his urging that it has finally reached completion.

I am most appreciative of the many hours of time and valuable guidance and support I received from Dr. Bernard B. Schlanger, Chairman of my Dissertation Committee and from the members of the Committee, Dr. Norma S. Rees and Dr. Harvey Halpern. Dr. Schlanger's expertise in the field of mental retardation has been a source of inspiration for many years. He was most generous in sharing his insights with me.

I am most grateful for the indispensable help I received, particularly in the preparation of the statistical analysis, from my friend and colleague, Dr. John Winters, Research Psychologist at the Johnstone Research and Training Center.

Thanks is also due to Dr. Dennis J. Buttimore, Superintendent of the North Jersey Training School, who kindly allowed me to conduct this investigation at the institution. I am also most grateful to the members of the staff there: to Mrs. Joanne Gober of the Psychology Department who supervised some of the testing, to the teachers, the cottage housemothers and most especially to the staff of my own Department of Speech Pathology. They were all unfailingly sympathetic, cooperative and helpful.

I wish my parents had lived to see the completion of this work. It was their self-sacrifice and love which set my feet upon this road. They would have been so happy and proud.

TABLE OF CONTENTS

LIST OF TABLES

Table | Page

CHAPTER I

INTRODUCTION

Recent linguistic research has advanced the proposition that linguistic forms and structures are universally acquired by normal children in an orderly sequence. This sequence is related to the child's cognitive development and the inherent complexity of the structures to be acquired (Brown, 1973; Slobin, 1973). The relevance of this general proposition to the mentally retarded has been affirmed by experimental studies by Lenneberg (1964) and Lackner (1968). However, after a review of the literature, Miller and Yoder (1974) are persuaded that this "conclusion is equivocal in that there are few developmental studies and no longitudinal studies of language development in retarded children at this time." Such studies would be of interest because they could cast some light on the similarities and differences which characterize the development of complex functions in retarded children as compared with normal children.

Children with Down's Syndrome (Mongoloids) have long been the subject of scientific study. Some researchers have raised the question whether this group "constitutes a psychological entity whose members possess characteristics of subnormality distinctly different from those of other clinical subtypes of mental retardation (Cornwell and Birch, 1969). Others (Evans and Hampson, 1968) wonder if one is "justified in thinking of mongols as being distinctive in their language patterns?" No study is now available on

the sequence of development of language in Down's Syndrome individuals.

BACKGROUND

Down's Syndrome is a clinical entity characterized by numerous physical stigmata, recognizable at birth. The condition can be confirmed by chromosomal studies which are readily available today and whose results are conclusive. The child with Down's Syndrome is, by definition, retarded although the degree of retardation may vary considerably and may be a function of the type of chromosomal aberration (trisomy, translocation or mosaic) (Shipe et al., 1968) and, as with all children, environmental factors such as extent and type of nurturance, physical well-being, availability of stimulation and educational opportunities as well as emotional stability. In 1958, Masland, Sarason and Gladwin estimated that about 20% of the severely retarded population had Down's Syndrome. There is no estimate available of the proportion of such individuals who are presently institutionalized in the United States. Because Down's Syndrome is immediately recognizable at birth, many such children are "put away" without ever being taken home by their parents. Sometimes such children are put directly into state institutions; more often, because of long waiting lists, they are placed in "homes" specializing in this type of care or transferred to a state institution when there is an opening.

The incidence of Down's Syndrome births, in proportion to all live births is about one in a thousand. However, the prevalence of Down's Syndrome individuals in the population has been rising and is expected to continue to rise because modern medical technology can overcome many of the natural hazards which previously took a heavy and early toll of their lives (Stein, 1975).

In 1846 Seguin described such a group of patients of whom he wrote, "il suffit d'avoir vu l'un d'entre eux pour ne plus risquer de les meconnaitre" ("It is enough to have seen one of them, never to run the risk of not recognizing them.") Because of this early and immediate recognizability, as well as the relatively widespread incidence of the syndrome, it has attracted researchers from many diverse disciplines. Literally thousands of studies have been done on every aspect of the condition. Every study which has considered the problem and investigated the characteristics of such individuals or focused on the comparative abilities of matched mongoloid and non-mongoloid retardates, has concluded that the one area in which the Down's Syndrome population is most deficient is language (Schlanger, 1957; Schlanger and Gottesleben, 1957; Lyle, 1959 and 1960; Mein, 1961; Johnson & Abelson, 1969; Share, 1975).

Clemens E. Benda, (1969) writes "between one year and ten years of age the mongoloid child passes through mental levels of from one to three years. The mongoloid is an infant for the first ten years of his life; in other words, it takes him ten years to accomplish what the normal child accomplishes in three years."

"...Mental levels of from one to three years." This is exactly the stage at which the normal child proceeds from single word utterances to practically complete mastery of basic adult language structure.

Recently, there has been a growing interest in what Mahoney (1975) calls the "ethological approach to delayed language acquisition." The ethological approach was previously applied to the study of normal language development (Bowlby, 1958; Bruner, 1975) and the language development of emotionally disturbed children (Tinbergen and Tinbergen, 1972). This model focuses not only on the development of the linguistic system of the child but asserts that such development is contingent upon the pre-verbal communication system prevailing between the child and his caretaker. Seitz (1975), reporting on studies which demonstrated that mothers of young children who acquire language normally, constantly modify their own linguistic output in accordance with signals from their children, cites, in contrast, the example of the negative, insensitive, uncooperative "interfering mother" who "assumes that she has a perfect right to do with (the baby) what she wishes, imposing her will on his, shaping him to her standards and interrupting him arbitrarily without regard for his moods, wishes or activity-in-progress." This might well be a description of routine behavior of institutional care personnel.

The detrimental effect of early institutionalization on the social and language development of mentally retarded children generally and mongoloids specifically has been well documented (Schlanger, 1954; Lyle, 1959 and 1960; Sievers and Esse, 1961;

Shotwell and Shipe, 1964 and 1965; Centerwall and Centerwall, 1960; Cain and Levine, 1963). This statement is not intended as a wholesale condemnation of all institutions. As a matter of fact to the personal knowledge of this experimenter, many institutions across the country have greatly improved their services in the area of early language stimulation and introduced programs intended to extend the narrow range of experiences available to their residents and provide systematic language development opportunities. Nevertheless, the very nature of an institution rules out the intimate, responsive interaction between a child and a single caretaker which recent research indicates underlies normal language acquisition. It is generally recognized that a crucial element in the child's language development is the interest and willingness of those in his immediate environment to respond to his attempts at communication. In the case of the institutionalized Down's Syndrome child there is almost always another serious element of interference to be reckoned with, i.e. extremely deviant articulation which makes the child practically unintelligible even when the listener is trying hard to understand, and child is making his best effort to communicate.

STATEMENT OF THE PROBLEM

The question which the present research project raises is this: given a severely retarded population in a severely limiting environment, which linguistic structures are learned and which are not? Where is the point of arrest? Lenneberg et al. (1964) concluded that his home-reared Down's Syndrome subjects "develop the

language code in a manner similar to children without intellectual deficits" and that they do not produce "bizarre forms," but merely are arrested at a "primitive level" of development.

This study attempts to provide a descriptive analysis of the language of early-institutionalized mongoloid individuals of different chronological ages, showing the development of various semantic-syntactic structures. Granted the basic premise that such children learn the linguistic code in the same general sequence as do normal children, the question remains, do they learn all the constituents of the code? To what extent is their language rule-governed? To what extent do they apply the rules consistently and in novel situations? Are there forms which normally develop at an early stage but which these children never acquire? Conversely, are there other structures, such as embedded clauses which normally appear later and are theoretically more complex, but which are acquired? Is there always a principle of "cumulative complexity" in operation, as postulated by Brown (1973), or are some of the specific forms which emerge influenced by functional and environmental considerations? Since language acquisition stretches over such a long period of time, Down's Syndrome children characteristically function at higher levels of motor and visual skills than verbal skills. (McCarthy, 1965; Hubschman et al., 1970). Older Down's Syndrome children who are still using two and three-word phrases predominantly are living in a different world and functioning at higher cognitive levels in some areas than the 18 to 24 month-old children who are using the same mean length of utterance. Bloom (1970) notes that normal young children char-

acteristically comment about the presence (nomination), recurrence or absence (non-existence) of things in their immediate environment. The older Down's Syndrome child will talk about events in the past, or events which are anticipated; she goes to school and "learns" the alphabet and how to spell her name and how to count. She has probably attained a relatively good level of personal self-care skills. How does she cope linguistically with this world which is so markedly different from that of the normal two-year-old?

Children at home are not "taught" their language; they acquire their early words and word combinations by a developmental process of sensorimotor and cognitive organization and responsive interaction with the objects, people and events in their environment. In a modern institution for the retarded, young, pre-verbal children may be taught a specific lexicon which may or may not have a functional relevance to their environment outside of the therapy room. The choice of the lexicon and of the linguistic structures taught may be made quite arbitrarily by the instructor (Kent et al., 1972; Bricker, 1972). The linguistic environment of the child outside of the therapy room may be quite different. How does the child learn to apply the structures taught and to what extent is he able to deduce the meanings and the "rules" so that he can eventually develop a functional linguistic code of communication?

NEED FOR THE STUDY

The work of Bloom (1970), Brown (1973), and Schlesinger (1971), among others, has focused attention about the semantic aspects of language development, and this type of analysis has

particular relevance for a population which is defined by its cognitive deficits.

In "A First Language - The Early Stages," Brown (1973) summarizes and analyzes a series of studies of the early language development of 41 normal children, living at home and learning 13 different languages. He concludes that when children begin to combine single words into two and three-word strings these combinations express a limited set of meanings and relationships across all the languages studied. They express the meanings and relationships perceived by the child at the sensorimotor level of organization described by Piaget (Ginsburg & Opper, 1969). Brown critically reviews in great detail the various theoretical explanations which have been advanced by linguists for the particular forms which the child develops in his first attempts to string together two or more words. He rejects the "lean" interpretations of McNeill (1970) and Braine (1963) in favor of the "rich" interpretations of Bloom (1970) and Schlesinger (1971). In essence, the difference between these points of view is that the former looks only at the structure of the child's speech from the perspective of transformational grammar, whereas the latter examines the child's semantic intent as revealed by the context and situation while, at the same time, taking note of the forms and structures available to the child at any given point to express his meaning.

Children begin to talk using single words. At about 18 months of age they begin to combine words and in the course of development they learn to use an increasing number of words in an utterance to express different meanings. This observation has

been used by Brown to revive what may be called a yardstick of linguistic growth, the Mean Length of Utterance. Sentence length was a popular measure of language development in the twenties and thirties and since its revival by Brown has been widely used again by contemporary investigators (Stanford studies, 1972; Miller and Yoder, 1974; MacDonald et al., 1974). It is a useful and practical means for categorizing levels of linguistic development and is valid, according to Brown from "about 1.0 to 4.0." Stage I is defined as the interval when the child is producing utterances of mean length above 1.0, in other words when two-word combinations first begin to appear, and extends to the point where the mean length of utterances in a corpus is 2.0. Stage II is defined as the period when the child's utterances fall between 2.0 and 2.50 in mean length of utterance. Stage III has an MLU of between 2.50 and 3.25.

Each stage of language development is characterized not only by limitation on the number of words used but by the relationships expressed and the development of new modes to express these relationships. The Stage I child typically learns to express the eight basic semantic relationships, uses the negative, question and imperative modes and controls proper word order. The major Stage II innovation is the appearance of the fourteen grammatical morphemes. Other more complex constructions such as embedded and coordinated sentences do not appear until Stage IV and V.

According to Brown the basic semantic relationships expressed by the Stage I child are:

1. Agent and action
2. Action and object
3. Agent and object
4. Action and locative
5. Entity and locative
6. Possessor and possession
7. Entity and attributive
8. Demonstrative and entity

After reviewing the definitions of these terms by Fillmore (1968) and Chafe (1970), Brown adopts the following definitions for these terms:

Agent - "someone or something, usually but not necessarily animate, which is perceived to have its own motivating force and to cause an action or process."

Action - "perceived movements." This category does not include the "stative" verbs such as see, want, know, need. The person who is the grammatical subject of such verbs, for example, "I see," "you know," is also not classified as "Agent." Instead, the grammatical subject of such verbs is classified semantically as "Person Affected or Experiencer Dative." In normal children, according to Brown, these "stative" verbs rarely occur in Stage I and therefore he does not include them in his list of basic relationships for that level.

Object - "Someone or something (usually something, or inanimate) either suffering a change of state or simply receiving the force of an action. The object may be the name of a person or thing or a pronoun like it or that."

Locative - "the place or locus of an action" or the "spatial orientation" of an action.

Entity - "any thing (or person) having a distinct separate existence."

Possessor and Possession - There are many meanings encoded by the genitive construction in English, but, according to Brown, Stage I children express only those which are "alienable," i.e. "Daddy chair," or "inalienable," i.e. "Mommy nose," in other words "property plus territory" and "part-whole."

Attribute - Specifies some aspect of the entity which would not be otherwise characteristic of the class, i.e. "little dog," "yellow block."

Demonstrative - this-that; here-there plus the entity, which is usually present. According to Brown, no evidence has been developed yet which indicates that the child uses these terms with a control of the "proximal-distal contrast."

In addition to these eight basic relations, Brown comments on the low-frequency occurence in the samples he studied of several other relations. Brown does not give his own definitions of these terms, but relies on illustrations to convey their meanings. Most of the terms were previously discussed by him in context of the descriptions of the work of Chafe (1970) and Fillmore (1968).

1. Instrumental
2. Benefactive
3. Indirect Object Datives
4. Experiencer or Person Affected Datives
5. Comitatives
6. Conjunctions
7. Classificatory

For the purposes of this study the terms will be used with the following definitions, adapted from Fillmore, Chafe and Brown:

1. Instrumental - an "inanimate force or object" used to complete the action named by the verb, (sweep broom).

2. Benefactive - the beneficiary of an action or state, (for Daddy).

3. Indirect Object Datives - the person or thing which receives the object of the verb, (Give me book).

4. Experiencer or Person Affected Datives - the animate being who is affected by the experience described by the stative verb, (Adam see).

5. Comitatives - Neither Fillmore nor Brown specifically define the term, but Brown's illustration "go mommy" appears to imply accompaniment of the action or state.

6. Conjunctions - Brown defines this as "simply naming present objects" without the use of conjunctive words such as 'and,' 'but,' 'because,' etc. In the present study the use of these conjunction words 'and,' 'but,' etc., if they occur, <u>will</u> be included with the constructions in which they appear.

7. Classificatory - This, again, is a term used without specific definition, with the example "Mommy lady." Its meaning, therefore, appears to be that of categorizing a noun into some superordinate relationship.

PURPOSE OF STUDY

This study has two purposes:

A. To investigate the language of early institutionalized Down's Syndrome subjects in order to discover the types of semantic-syntactic structures which they develop and use. In order to permit a developmental study, the subjects' chronological ages range from childhood to adulthood.

B. To determine in what respects language development in these subjects is similar to, and in what respects it differs from language development of non-institutionalized normal children.

In order to satisfy the purposes of this study, the subjects selected met the following criteria:

1. Individuals with Trisomy 21-type Down's Syndrome.
2. Placed in a residential institution before the age of four.

3. Uninterrupted residence in an institution since initial placement.
4. Language development not beyond the single word stage at the time of institutionalization.

HYPOTHESES

The following hypotheses are postulated:

A. Early institutionalized Down's Syndrome individuals by the time they reach adulthood have mastered the linguistic skills characteristic of the Stage I normal child.

B. Early institutionalized Down's Syndrome individuals by the time they reach adulthood learn some of the grammatical modulations which characterize Stage II linguistic development, but some modulations are never incorporated into their spontaneous language usage although they may appear in structured routinized sequences.

C. Early institutionalized Down's Syndrome subjects spontaneously use some semantic relationships and grammatical structures not commonly characteristic of Stage I and Stage II.

LIMITATIONS

This study does not pretend to apply universally to all Down's Syndrome individuals learning language in an institution.

CHAPTER II

REVIEW OF THE LITERATURE

Most studies exploring the language of Down's Syndrome subjects have investigated one of three general problems or some combination of these:

1. Is there a pattern of language acquisition, development, understanding and usage which is typical and distinctive? If there is such a pattern is it related to the level of retardation and does it affect all developmental areas or only, or most particularly, language? Such studies have focused on receptive and expressive language from a number of points of view and have compared mongoloids matched with normal children or with retarded children of other etiological groups.

2. What is the effect of institutionalization on the language and speech of Down's Syndrome children? Such studies have matched groups of institutionalized and home-reared children and compared their performance.

3. Can language training programs accelerate the rate of acquisition and improve the quality of speech of Down's Syndrome children? Such studies typically have a pre-test, a training program and then a post-test using the same instrument.

In this review the nature of the test or measuring device used for evaluation will be of particular interest.

I. Is there a typical Down's Syndrome pattern of language acquisition and development?

There was a tacit assumption in many of the early studies (Clausen, 1974) that because mongolism is a unitary medical syndrome with easily recognizable physical stigmata, it must perforce be associated with a relatively homogeneous and characteristic complex of behaviors, including language behaviors. This assumption has been put to the test of research more recently, but the issue has not yet been conclusively settled by any means (Zakulin, Gibson, Mosely and Brown, 1974).

In the early studies the terms language and speech were used as if they were synonyms. Indeed, there was so little thought or attention given to the matter that one investigator (Blanchard, 1964) measured maturation in communication by an articulation test. Lyle in 1961 was the first to include any type of comprehension measure in his test battery. It was not until a decade later that there was any investigation of comprehension of different grammatical structures (Semmel and Dolley, 1971). As early as 1957 Schlanger had been interested in grammatical structure and had developed criteria based upon the absence or inclusion of the traditional parts of speech in spontaneous verbalization. The content of the language of Down's Syndrome individuals, the influence of social factors such as different dyad groupings, and the extent to which gestural language systems may be used by this population has never been studied.

The Gesell Developmental Scales, first published in 1925, proposed a combination of tests and observations which could serve as a scale of normal development in the areas of motor coordination, language development, adaptive behavior and personal and social behavior. These are of interest because a number of studies up to the present time describe early language development in terms of the Gesell scales. As described in the second edition of Developmental Diagnosis (1947), these language "landmarks" are defined only in the most general and vague terms. Thus, the normal 18-month-old is said, typically, to use jargon and to command the use of only a half-dozen words. By 24 months, a normal child is said to have a vocabulary of about fifty words and to use simple three-word sentences, including personal pronouns. He asks for "another...." By 36 months the vocabulary of the normal child contains countless words and he uses well-formed sentences, using plurals.

By contrast, Gesell and Amatruda report (1947) that "the statistically typical mongol....uses words and possibly phrases at the age of 3 years....speaks in simple short sentences at 6 years."

In the studies which use the DQ scale (Developmental Quotient) in relation to language development this information is usually supplied by the parents and it is the parents who must interpret the meaning of the terms "phrases" and "sentences." It is obvious that such terms are thought to be self-evident, needing no technical clarification.

There are two long-range longitudinal studies which have been conducted with home-reared DS subjects, using the Gesell DQ

scales in the early years until the children could be tested with the Stanford-Binet or other intelligence tests (no other language tests are reported in either study).

Six hundred twelve DS patients were followed by the Levinson Center for Mentally Handicapped Children in Chicago (Melyn and White, 1973) for 20 years. They report great variability in all aspects of development. In the area of speech development, their statistics show that "95% of the home-reared Down's Syndrome boys have employed their first words by the time they are 53 months old. By 85 months, 95% of both boys and girls should be speaking in sentences."

The Child Development Clinic at the Los Angeles Children's Hospital has followed approximately 300 Down's Syndrome subjects for 10 to 15 years. This study also included DS children in New Zealand, both institutionalized and home-reared. For the youngest children the Gesell DQ was used and for the language development sections, the items were "defined"as follows (Share, 1975):

"Language Landmarks:
1. Laughs aloud
2. Says "dada" and "mama"
3. Obeys simple commands (ball throwing - 2 directions)
4. Word combinations (2-3)
5. Sentences (3 words) "

As in the previous study, the area of slowest development was speech. The median age for the use of sentences (three words) for the Los Angeles community sample is given as 46 months, for the New Zealand home-reared group, 50 months. The median age for the use of sentences is not listed for the New Zealand institu-

tionalized sample, but this population is reported to have been using word combinations (two-three words) by 45 months.

Engler (1949) reported that in a group of institutionalized mongoloids only 49.4% had begun to speak by the age of three, 61.7% by four, and 81.2% by the age of five.

Strazzula (1953), working with a group of home-reared DS children in Brooklyn, also used the criteria of onset of words, phrases and sentences and related the results to the IQ levels. Relying on the information furnished by parents, she found that children whose tested IQs were between 40 and 70 started to talk at 33.4 months and used sentences at 60.8 months, whereas children who tested below an IQ of 40 started talking at 34.7 months and used sentences at 73.7 months. The chronological ages at which the IQ scores were obtained are not furnished. In this regard, it must be noted that both the Chicago and Los Angeles studies have confirmed the widely noted pattern of IQ decline with increasing chronological age, and Fishler (1975) summarized the data for the 21 trisomy Down's group as leveling off at an expected "scatter from 30 to 50 IQ points."

In the fifties no theory of language acquisition and development had been proposed and no test of language, per se, was available. Indeed, Kolstoe (1958) complained that "the nature of language development and its measurement was a major difficulty...." In the absence of a unified theory, researchers attempted measurement by many different devices. In 1925 Nice had suggested sentence length as a reliable measure and McCarthy (1954) lists 14 investigations with normal children which used this

measure. In 1953 Schlanger applied it to a group of retarded children, but the study does not have an etiological breakdown. Schlanger used a variety of other measures in the same study: the number of words per minute, an "articulatory index" elicited by both spontaneous and imitative naming and conversation, and a test of sound discrimination.

Schlanger attempted to relate etiology to levels of linguistic development in 1957 and for this purpose developed the following criteria which he then applied to the 516 residents of the Training School at Vineland:

> "Group 1 - expressive language is rudimentary with a complete or partial lack of verbal response. If there is oral responsiveness, this does not go beyond the utilization of undifferentiated gestures and/or one-word sentences.
>
> Group 2 - verbal output is limited and consists of short, incomplete sentences and phrases. Sentences are two to three words long, simple, with later developing sentence parts such as prepositions, relative pronouns, adverbs, adjectives omitted.
>
> Group 3 - full sentence usage with verbal output consisting of sentences of four or more words. Sentences may be simple or complex but they express complete thoughts or ideas."

The 516 residents were divided into 15 etiological groups. There were 44 mongoloids. Of all the etiological groups, the mongoloids had the highest percentage (25%) in Group 1, the highest percentage (52%) in Group 2 and the smallest percentage (23%) in Group 3. When the speech defects of this same group of subjects was analyzed by Schlanger and Gottsleben (1957) the mongoloids again had the

highest percentage (95%) of articulatory defects, the highest percentage (72%) of voice defects, and the highest percentage of stutterers (45%). At the time of this report, it should be remembered that the Training School was one of the few institutions in the country which had an established Speech Department in operation for almost ten years.

Blanchard (1964) measured "maturation in verbal communication" by comparing the way institutionalized retarded children articulated consonant sounds with the established sequence of development of consonant sounds by normal children. Her subjects were 350 retarded children at the Pacific State Hospital. The children ranged in chronological age from 8 to 15, IQs from 27 to 68. There were 50 mongoloids in the group. All 50, or 100%, had deviant articulation; only 37 showed "measurable components of normal patterns," 29 had an "unusual voice quality" and 13 were listed as having "deviant language." The study does not specify how this last parameter was measured since the test consisted simply of a game of naming things.

Main (1961), in England, attacked the problem from a different point of view. He was interested in discovering whether severely retarded children follow the same developmental pattern in the growth of language as normal children do, but at a slower rate, or at a later period in life. His criterion was the proportion of nouns to other parts of speech as used in conversation and picture description. Main quoted McCarthy's (1950) study which showed that as the normal child matures the proportion of

nouns in his speech decreases from about 50% of the words used by the 18-month-old child to about 19% for the 4½-year old. Mein found that as mental age increases, the retarded child, just as the normal, tends to use a lower percentage of nouns. However, he did find "significant differences in the use of nouns and articles between pairs of mongol and non-mongol patients matched for sex, MA and CA." He concluded that "if it be accepted that the noun percentage is a valid indicator of language level, it is possible to conclude that mongols function at a lower level than non-mongols...." Mein's subjects were institutionalized retardates, CA 10-30, MAs 57-59 months. Mein originally planned to base his study only on samples of free conversation, but he found that his subjects had so much difficulty in sustaining a conversation that he resorted to alternating between picture description and conversation. His raw data were gathered in nine ten-minute interviews.

In the same year, 1961, Lyle (also in England) followed up a series of earlier experiments (to be discussed in Section II of this review) to determine whether, in fact, retarded children were deficient in verbal intelligence as compared with normal children with matched IQs, and if so, in what particular respects. As in all his experiments, Lyle used the Minnesota Pre-School Scale, which yields both a non-verbal and verbal IQ. He matched his subjects on the non-verbal scale and their performance on the verbal scale was the dependent variable. However, Lyle also devised a separate battery of speech and language tests which included:

1. Comprehension of familiar object names.
2. Speech sound discrimination and reproduction.
   (80 sounds in simple words to be imitated)
3. Word naming or labeling of 50 objects.
4. Definition of words (24 out of 50).
   (e.g. "what do you do with a table?")
5. Complexity of language.
   "grammatical accuracy and complexity of sentences used by children in describing standard picture material and answering standard questions about the pictures." (Lyle does not specify how this was evaluated.)

Lyle used 58 pairs of retarded and matched normals; The retarded subjects lived at home and attended day schools. "Mongoloid and non-mongoloid imbeciles (and their normal pairs) were at first grouped separately in case there were differences between these sub-groups; but inspection indicated that the data for both of these types of imbeciles in relation to their normal controls were quite similar."

One of the surprising results of the investigation, according to Lyle, was that the retarded subjects found the discrimination and reproduction of speech sounds to be fourth in order of difficulty (or in other words, the next to most difficult part) exceeded only by the last test, i.e. grammatical complexity. Lyle proposed a developmental sequence of early language behavior characteristic of severely retarded subjects:

1. No response
2. Jargon
3. Echolalia
4. Sign language (gesture)
5. Irrelevant verbal responses
6. Speech

He concluded that the "fixation of early language characteristics combined with the difficulties in articulating and formulating meaningful sentences....explains the frequent regressions in language development noted in imbeciles. That is to say, it was in general on the more difficult items, to which the imbecile children

could not attach meaning or to which they could not immediately formulate adequate verbal responses, that even verbally accomplished imbeciles reverted to the use of early language characteristics." Reviewing his findings Lyle suggested (1961) that there may well be cortical impairment of the symbolic process which causes verbal intelligence to lag behind other areas.

Cornwell and Birch (1969) examined 44 home-reared Down's Syndrome children, CA range 4 to 17, with the Vineland Social Maturity Scale and the Stanford Binet. Subjects were tested twice with the same instruments, with a two-year interval between testings. Analysis of the results on the Binet showed that "language development lagged at all ages." In the Vineland test, although there was improvement in some self-help skills, "there was no significant improvement in skills relating to communication, socialization or self-direction." As do other authors, Cornwell and Birch stress that in spite of much variation in performance, their data suggest "not merely a delay in the development of certain functions, but also an arrest in function."

A follow-up study was conducted by the same authors in 1974. They were interested in testing the hypothesis that a discrepancy exists between "language function" and "language expression" among mongoloids. They also wanted to evaluate the role of language in "concept formation, abstraction and higher level integrative abilities." For this purpose they used selected and modified portions of the Stanford-Binet scale. The tasks included recognition and naming objects, and recognition

and naming of objects by function, numerical concepts, animal concepts, coin sorting and color-form test.

Results showed better comprehension than expression on the language items. There was a gross deficiency in all areas of numerical concepts, although rote counting improved with MA. The ability to "form concepts and to group objects in meaningful categorical relations is grossly lacking."

The authors conclude that their data reveal not only a developmental lag but a virtual absence of high-level concept and integrative functions.

The first study to apply modern principles of linguistics to the analysis of the language of mongoloids appeared in 1964. It approached language development as a problem of learning rules rather than accumulating vocabulary or learning word sequences reinforced in a particular environment. Lenneberg and his collaborators studied the language of 61 home-reared Down's Syndrome children over a period of three years. The total age range for the subjects was three to 22 years. A variety of data were collected including articulation tests, sentence-repetition tests, comprehension tests, vocabulary studies, recordings of spontaneous speech, psychological, medical, and neurological tests. Very little information is provided concerning the specific content of any of the tests. The study is, however, very illuminating from the point of view of general linguistic theory. Lenneberg was addressing himself primarily to the important theoretical issues of the day. His major points were:

1. Language development is related to biological maturation rather than intelligence level.
2. Down's Syndrome children learn language in essentially the same sequence as do normal children. (It is interesting, parenthetically, to note that Lenneberg also uses the terms "words, primitive phrases, sentences" without further clarification or definition). The one exception to this parallel development is articulation, which lags behind. Twenty-five children in the sample (no age or IQ levels provided) were given an articulation test and their performance compared with their sound production in spontaneous speech. In all cases articulation during the test, which was constructed as an imitation of single words, was far superior to spontaneous speech production. (See Dodd, 1975, p. 28, below).
3. Mongoloid, as well as normal children learn language by mastering general principles, i.e. by learning the "rules."
4. Mongoloid, as well as normal children process sentences as a whole, not in a sequential left to right pattern, with the first word triggering the next and so on.
5. Mongoloid children do not learn language by merely "parroting," any more than normal children do. They may fall back to imitation when the sense of the sentence is not understood. (See Lyle, 1961, p. 24, above).

Another interesting study based on transformational grammar theory tested the hypothesis that speed in comprehension was related to the number of transformations used in the construction of the sentence. Semmel and Dolley (1971) cite the work of Slobin who reported that among normal children and adults speed of comprehension descends from the simple kernel sentence to the passive to the negative and finally to the negative passive. In the normal population this order of difficulty interacts with chronological age, suggesting the possibility of developmental changes. The investigators presented these four types of sentences for both comprehension and imitation to 40 home-reared Down's Syndrome subjects, CA six to 14 years with a mean IQ of 34. Each child was presented with four pairs of pictures showing the following reversible situations: a) a clown hitting a ball and a ball hitting a clown; b) a girl kicking a boy and vice versa; c) a pot of flowers hitting a ball and vice versa; d) a cat chasing a dog and vice versa. For the comprehension part of the task, the child had to identify the picture which showed:

a) The dog is being chased (by the cat).
b) The dog is not chasing the cat.
c) The dog is chasing the cat.
d) The dog is being chased (by the dog).
e) The dog is not being chased (by the cat).
f) The cat is not chasing the dog.
g) The cat is not being chased (by the dog).
h) The cat is chasing the dog.

Similar sentences were constructed for the other situations. For the imitation part of the task the child was asked to repeat the sentence but the "by" clause was omitted so that the results would not be confounded by the problem of length.

Subjects were able to comprehend and imitate simple declarative (kernal) sentences. Negative sentences were treated as if they were affirmative, with the negative transformation ignored. The passive and negative passive sentences were not understood. Sentences to which optional transformations had been applied, whether negative, passive or negative-passive were imitated significantly less correctly than were the simple declarative sentences. The experimenters note that these subjects "may have the competence to deal with negative sentences, but may fail to attend to the negative marker in the surface structure and thus treat the sentence as if it were an affirmative string." Contrary to Lenneberg's findings, this study suggests a significant relationship between IQ and the ability to imitate various sentences.

Many of the studies reviewed above noted the extreme articulatory deviations commonly found among Down's Syndrome persons. Two recent studies tackled this problem, one by Dodd (1975) in England and the other by Eilers (1975) at the University of Washington.

Dodd reviewed the literature showing that Down's Syndrome children could imitate words better than they were able to use these same words spontaneously in context. Hypothesizing that this deficit was due to an "inability to use programmed sequences of articulatory movements rather than to an inability to store or use auditory stimuli," Dodd designed an experiment using 10 community Down's children matched with 10 severely retarded community non-Down's Syndrome children. Mean CA was 9.1, mean IQ 47, using

the Merrill Palmer Scales. Retardates were selected as the control group because their phonological development was appropriate to their mental level. The task included both recognition and reproduction. The stimuli were ten real and ten nonsense words. The real words were selected because young normal children, in an earlier experiment, had difficulty with them. The nonsense words were derived from the real words and were constructed on the basis of a set of phonological rules transforming the real words into nonsense words. Thus the real words and the nonsense words were theoretically of equal phonological difficulty. For example: banana/pæmæmə/; tomato/dəmador/. Both recognition and reproduction were requested at three time intervals: immediately upon presentation, after a 15-second delay and after a 30-second delay. The apparatus was rather complicated and cumbersome involving three loudspeakers, with the central loudspeaker used to present the stimulus and the other two identified by a mouse and a chicken placed on top of them. For example, in the recognition task, the central loudspeaker presented the stimulus, one of the other loudspeakers repeated the stimulus, while the third said a "foil" word. The child had to tell whether it was the chicken or the mouse which had repeated the stimulus word.

Results showed that the Down's Syndrome group were better at recognizing words than their matched controls, they performed about equally well on immediate reproduction, and the non-Down's group reproduced words better after a 15-second and 30-second delay. Both groups performed somewhat better with real words than with the nonsense words. However, on reproduction after delay,

the mongoloid children "treated real words as if they were nonsense words," that is, they made about the same number of articulatory changes in both types of stimuli. On the other hand, the other severely retarded group made many more changes in nonsense words on delay than on real words.

Dodd feels that her results support her hypothesis and also lend support to the position that "auditory perceptual performance and articulatory performance are not necessarily interdependent." Moreover, she notes that there is experimental evidence demonstrating that Down's children learn and perform poorly on motor tasks, and have long reaction times to auditory stimuli. She suggests that poor motor performance may be related to the disproportionately small cerebellum which is characteristic of the group.

Another study by Dodd, reported by Smith (1975), compared ten DS children and ten normal children matched for MA and "institutionalization." The children were shown 50 pictures. They were asked to name the pictures, then imitate the name and finally to again identify the object spontaneously. The most interesting result of this experiment was that whereas the errors of the normal group could be accounted for by "23 rules" consistently applied, "the Down's Syndrome children on the other hand used all these 23 rules but had many errors still left unaccounted for: errors which were so inconsistent as to defy rule-based analysis."

Eilers (1975) investigating much the same problem, came to the tentative conclusion that "there is a mis-match between the Down's productive and perceptual systems....The Down's child's productive system seems to be developing more normally during the first

year of life than his auditory perceptual system which seems much delayed." She speculates that this lack of normal development of auditory perception may account for the productive errors commonly noted in these children. However, she cautions that this is an interim report of an experiment still in progress.

Eiler's experimental design consists of three types of stimulus pairs. Type 1 pairs are those which contain phonemes commonly substituted by normal 2-year-old children, for example dog-gog, thumb-fum, rabbit-wabbit. Type 2 pairs are also differentiated by one sound, but are not commonly-occurring substitutions, e.g. pig-tig, spoon-soon. A Type 3 pair was included as a control item to ensure that the children understood the nature of the task. The Type 3 pair differed on two phonological features and the pair was not commonly in a substitution relationship.

The subjects in this experiment are normal children with a mean CA of 24 months, and two groups of Down's Syndrome children, CA 2½ to 4 years and 4 to 6 years.

The experimental apparatus was much simpler than in the Dodd (1975) experiment and it would seem, therefore, much easier for the subjects to understand. Each pair of words consisted of one familiar object or thing and one nonsense word for which an unfamiliar nonsense toy was designed. The two were put on top of containers and there was a reward under the container of the word named. Thus in training, for example, a horse-dog pair was used. Each was put on top of a container and when the experimenter named one the child lifting the correct container found a reward.

In addition to the recognition or perception task, the children's attempts at production were also recorded.

Results of the data to date show a much higher percentage of perceptual failure on the part of the Down's children. Many discriminations made by normal two-year-olds were much more difficult for older Down's children in Eiler's study. Moreover, the pattern of discriminations made by the normals and the Down's children differed in some respects.

Dodd and Eilers were both studying perception and production. Because of differences in their research designs, one concluded that the productive system was more deficient and the other that it was the perceptual system which was more defective. This apparent conflict is not difficult to understand if one looks at the stimuli each presented. Dodd's nonsense words differed more from real words than even Eiler's Type 3 words, and they were therefore doubtless easier for the children to differentiate than phoneme substitutions which many of the children probably used themselves, such as Eiler's Type 1 and Type 2 words. In any case, both researchers concluded that their subjects were learning the code in a manner different from that of normal children.

Results of the last three studies would seem to offer a challenge to the conclusion that DS children develop language as do normal children, except at a slower rate. However, the issue is by no means resolved. In 1968 in their review of the literature, Evans and Hampson reject the proposition that there is a specific language deficit connected with mongolism. This point of view is vigorously sustained by Joanne Ryan (1975), who refers

to an ongoing experiment comparing 16 home-reared DS children with 15 matched retarded children of other etiological groups and with 13 children of average intelligence. (CA range for the retarded groups was five to nine, SB MAs 2½ - 3½). In part of the study the children were matched for MUL (mean utterance length) and then the proportion of complete sentences (now defined as "noun phrase plus verb phrase"), incomplete sentences, cliches and "ready-made" utterances was calculated. There were no differences among the groups on these measures, nor in the range and variety of verb transformations. However, as compared to the normal, both groups of retarded children were inferior in the areas of "grammatical abilities and on measures of grammatical complexity of speech." Ryan concludes that the pattern of similarities between the normal and retarded groups is much greater than the differences, and that the differences also affect areas of behavior other than language. Ryan argues persuasively that the differences that do exist need not necessarily be due to IQ per se, nor to specific etiology, but that the very fact of retardation creates such a completely different life experience in terms of parental expectations, reactions and interpersonal interactions with the environment, that it is often impossible to determine whether a specific language handicap exists at all.

Finally, a few studies used the ITPA to assess the relative strengths and weaknesses of Down's Syndrome subjects.

McCarthy (1965) was the first to use the ITPA (experimental edition) to compare 30 home-reared mongoloids and non-mongoloid retardates. Mean MA for both groups was 4.1, mean CA 9.4 and mean

IQ 45. She found a pattern of performance on this test which other studies confirmed: despite considerable individual variation, the mongoloids, as a group, showed their greatest strength in Motor Encoding and their greatest weakness in the Auditory-Vocal Automatic Test.

Bilovsky and Share (1965) also tested home-reared Down's Syndrome children with the ITPA, but their approach was different. Their subjects were 24 children, mean CA 13-11, mean IQ 46.6. Using the Experimental Edition of the ITPA, they calculated the overall language age score for each subject. They then graphed each child's deviations on each sub-test from his own total language age. They found that the group's strengths were in the representational level in the motor encoding and visual decoding channels and their greatest deficits were in the automatic sequential levels in the auditory-vocal channels. In summary the authors note that "where the mode of reception is visual or where the mode of expression is motor the subjects of this study perform well above their language norm." However, the subjects were "most deficient in their ability to deal with non-meaningful symbols," in other words, the grammatical markers which have no independent meaning.

Hubschman, Polizzotto and Kaliski (1970) tested the performance of institutionalized mongoloids on the experimental edition of the ITPA as compared to their performance on the revised edition of the same test, and compared the two scores with their performance on the PPVT. The purpose was to determine the reliability of these various measures with the subject population. Fifty-three Down's Syndrome residents of a state institution were the subjects; mean

CA 13-11, mean IQ 42.4 on standardized tests such as the Stanford-Binet, WISC, or SIT. The scores on the two versions of the ITPA correlated highly with the PPVT. What is of particular interest here is that performance on both versions of the ITPA showed a very similar pattern to that already described in the previous studies: best performance was on the representational level, in the visual and motor channels, poorest performance was on the automatic level in the area of grammatical and auditory sequencing.

As a result of all these studies we can perhaps make one statement with certainty. Down's Syndrome children are retarded in language development. That is not a startling conclusion. It does not answer the questions posed at the beginning: a) is their language retardation a function of their intellectual limitations; b) is language more handicapped than other developmental areas; and c) is there a particular and characteristic pattern of language development which differs from that of normal children and of retarded children of other etiologies?

Some of the reasons for continuing ambiguities may lie in the nature of the questions the investigators asked and in the continuing difficulty of making valid assessments. Few investigators have focused on the content or structure of the subjects' spontaneous speech nor on the extent and manner in which mongoloids use speech to serve the ordinary needs of human intercourse. Specifically, no studies have examined the semantic relationships expressed spontaneously. Another problem is that none of the studies has controlled for the possible presence in the subject population of those who are mosaic Down's rather than the usual trisomy 21 type. Fischler (1975) in a sample of 15 mosaic Down's

Syndrome children found that "those individuals with the higher IQ levels often demonstrated an unusually good quality of speech." Only a cytogenetic examination can determine the chromosomal type of mongolism and thus far there have been only a few studies of children with mosaic Down's Syndrome. It is not yet possible to say definitely how and in what way these individuals differ from those with the far more prevalent trisomy 21 chromosomal pattern.

II. What is the effect of institutionalization on the language and speech of Down's Syndrome children?

In 1959, Lyle set out to determine how severely retarded children who lived in an institution compared in verbal skills with matched children who lived at home and attended community schools. Lyle matched a group of community mongoloids with institutionalized mongoloids and a group of community non-mongoloids with institutionalized non-mongoloids. As explained above, he administered the non-verbal scale of the Minnesota Pre-School Scale to all his subjects and then matched the groups on the basis of these scores. The dependent variable, then, was their performance on the verbal portion of the Minnesota scale. The relevant statistics on his subjects were:

	DAY SCHOOL			INSTITUTION		
	N.	Mean Non-Verbal M.A.	Mean Verbal M.A.	N.	Mean Non-Verbal M.A.	Mean Verbal M.A.
Mongols:	76	3-5	2-11	34	3-2	1-11
Non-mongols:	41	3-5	3-2	43	3-5	2-8

Lyle notes that the Minnesota verbal sub-test can be answered quite satisfactorily with monosyllables. It makes no great demands in terms of grammatical complexity or clarity of articulation. Both the Down's Syndrome and non-mongoloid community groups performed significantly better on the verbal test than the institutionalized groups. However, there was an additional difference which is noteworthy. "There was a significant difference between mongols and non-mongols in the institution of nine months of verbal MA. The difference between mongols and non-mongols in day schools was not significant. This raises the interesting possibility that residence in an institution may inhibit the verbal development of mongols more than non-mongols."

Not satisfied with the verbal sub-test of the Minnesota Scale, Lyle (1960) devised his own battery of speech measures and administered these to the same groups of children. The tests are described above on page 23. On these tests, as well, the mongoloids whether in the community or institution scored below the non-mongoloids. This was particularly apparent not on the simpler tests, i.e. comprehension and word naming, but on the more difficult sub-tests, such as definition and complexity of language. Lyle also remarked that the mongoloids "suffer a particular difficulty in discriminating and reproducing speech sounds." All the children in the institution scored lower on the verbal tests than the matched groups in the community.

Shotwell and Shipe (1964) conducted a study which bears directly on the question of the effect of early institutionali-

ization which is raised in the present investigation. They tested two groups of mongoloid children who were admitted to Pacific State Hospital. Twenty-five of these children had been in their own homes until admission to the institution; seventeen had been placed at birth or soon thereafter in licensed "homes" specializing in the care of retarded children. The tests used were the Kuhlmann-Binet (1922), the Stanford-Binet, Form L (1937) and the Vineland Social Maturity Scale. All the children were tested three times: once prior to admission to determine eligibility, on admission day and 18 months after admission. The authors were interested in intellectual and social development and make no specific reference to language. However, they conclude that "institutional placement during the earliest years of life adversely affects the development of mongoloid children."

Schlanger (1954) focused on the speech development of matched pairs of institutionalized and community retarded children, but does not specify etiological groupings. He found the community children superior in both parameters measured, i.e. mean sentence length and number of words per minute.

Mueller and Weaver (1964) compared matched groups of institutionalized and community trainable retardates on the Experimental edition of the ITPA. Etiology was not specified and therefore we do not know how many mongoloids were in the groups. The over-all patterns for both groups were similar and did not differ radically from those discussed previously; the highest scores were achieved on visual-motor association, then visual decoding and third motor encoding. The lowest scores were

on vocal encoding followed by auditory vocal-automatic. The most surprising result of this study was that on all of the sub-tests and the total language age, the institutionalized group scored higher than the community group. The authors state they could not "reach any reasonably firm conclusion" on the basis of their data to account for this surprising result. Other findings were more predictable: vocal encoding scores for both groups were significantly below total language age scores, and total language age scores were approximately 19 months lower than Stanford-Binet MA scores.

On the issue of the adverse effect of institutionalization on the language development of mongoloid children, we find considerable but not uniform evidence to substantiate this position.

III. Can language training programs accelerate the rate of acquisition and improve the quality of speech of Down's Syndrome children?

An interesting early study was conducted by Kolstoe (1958). Searching for appropriate language measures, he devised procedures which were forerunners of ideas receiving wide currency and acceptance ten years later. He was dissatisfied with formal test procedures, although he used the Illinois Language Test, an early version of the ITPA, as one measure. Kolstoe developed an Observational Scale which incorporated assessment of "vertical language development," and "horizontal language development." "Vertical language development" is defined as "growth in complexity of language functioning." In today's terminology it would

mean observation of growth from use of single words to construction of two and three word strings. "Horizontal language development" is defined as "the broadening of the child's ability to comprehend and verbalize" at a given stage of development. This seems to imply among other things an accretion in vocabulary. Obviously there were many theoretical problems presented by the data and Kolstoe discusses these. He notes that two-word combinations such as "want doll," "get shot," "dolly sick," "go home" contain no sentences and score low on a vertical scale, but express "sequential, logical, interrelated and complex ideas." On the other hand, sentences like "I want that," "Oh looky that" are "grammatically more complex," but "express very simple, single ideas." He suggests that perhaps "a vertical description of language development based on the communicative aspects of language" would be more effective.

The observational scale was applied in two free play and one structured situation, each lasting for half an hour. Observers recorded all utterances. The stimulated situation involved a candy game during which a piece of candy was "hidden" and the child given simple directions to assess his comprehension. At the end, candy was given as a reward.

The composite scale included recording of the use of various parts of speech (pronouns, prepositions, adjectives, etc.), the length of the utterance, whether or not the utterance referred to the "here and now," and if it was simple or complex.

The subjects for the study were 30 matched pairs of institutionalized mongoloids, half of whom served as the experimental

group and the other half as the controls. The teaching program lasted for five-and-a-half months. Unfortunately, both the experimental group and the controls regressed on the second testing, though the experimental group regressed less than the controls. Regardless of this outcome, the study has much of interest and originality to recommend it, and it must be remembered that Kolstoe, himself, recognized and explicitly lamented the lack of a fully developed theory of language acquisition.

At the North Jersey Training School an experimental language development program was conducted with nine matched pairs of mongoloid children for four years 1965-1969. The children were tested annually. Test instruments were the Cattell Infant Intelligence Scale (or the Stanford-Binet Form L), the Vineland Social Maturity Scale, and the N.J.T.S. Language Modalities Test. The LMT, which can reach a population below the levels testable by the ITPA, was developed at the Training School and was based on the Parsons Language Sample (Schiefelbusch et al. 1963). The test assesses the subject's ability to identify, name, and/or imitate the name of common objects, miniature objects, pictures, body parts and colors. It has a section on comprehension of simple commands, imitation of movements and matching of objects and colors. It yields a semantic score and an articulation score. It is not standardized on any population, but has been used extensively as the basis of teaching programs at the institution. The purpose of the experiment was to determine whether language development could be measurably accelerated by daily half-hour language stimulation lessons. At the start of the experiment

the children in the experimental group had a mean CA of 40 months, mean MA of 12.7 months, mean IQ of 33. On all measures, the experimental children showed consistent and sustained improvement over the control group (Hubschman 1968).

A Research Monograph from the Department of Mental Hygiene of the State of California (Rhodes et al. 1969) describes a Language Stimulation and Reading Program for Severely Retarded Mongoloid Children. An intensive program concentrating on language was developed and was the total focus of all the children's activities during their waking hours. Unfortunately, the Monograph gives results only in the most general terms, omitting tables and figures alluded to in the report. The program emphasized the building of concepts in context, the development of language appropriate to the situation, and the improvement of articulation when language emerged. There were 10 children in the program and at the time of the report the program had been in progress for three years. Nine children had progressed to reading simple sentences.

It seems clear that Down's Syndrome children can benefit from language training and that comprehension and expression can both be developed and improved--up to a point. The crucial question remains--up to what point? The present investigation hopes to contribute some clarification in answer to that question.

CHAPTER III

METHODS

The study was designed to explore some dimensions of the comprehension and language usage of early-institutionalized Down's Syndrome individuals. To accomplish this, both spontaneous speech samples and formal tests were used.

SUBJECTS

The six subjects all had entered the institution not later than CA four years. All have Trisomy 21 Down Syndrome as determined by chromosomal analysis. Four of the children had previously been in private placements since birth. At the time of institutionalization none of the children used more than single words and some entered as infants. All developed their present level of language skill at the institution. Only one child (Lisa) enjoys regular visits at home. The institution provides the educational, speech, and recreational services common in a modern residential facility. At the present time, education and language development classes are provided from about the age of three to 20. There are no males over the age of twelve.

Compared to their mongoloid peers, the children selected for the study were known to be relatively more responsive, outgoing and intelligible in the judgment of the experimenter. None of them had the open-mouthed, tongue protruding physiognomy which is a stereotype of the syndrome. These children were selected to insure

that sufficient analyzable data would be obtained. The subjects therefore are not broadly representative of early-institutionalized Down's Syndrome individuals. In order to secure a sample from childhood to adulthood, the subjects' chronological ages ranged from 5 years 10 months to 20 years 8 months. Data on the individual subjects concerning the date of birth, date of admission, latest psychological test scores, scores on the PPVT and ITPA and personal details are provided in Table 1 and 1A. Tables are constructed with the subjects listed in order of chronological age. Chronological age is calculated as of June 1, 1975.

On the verbal IQ tests the familiar descending pattern emerged, with the youngest subject having the highest IQ and the oldest, the lowest. Comparison of MA and IQ scores between the verbal psychological test and the PPVT shows considerable variation within a fairly constricted range. Scores for subjects Lisa, Kathy, Randi and Janice on the two tests are closely comparable, but there are wide disparities on the scores on the two tests for subjects Mary and Susie. On the whole, the psycholinguistic age on the ITPA compares more closely with the MA on the PPVT than with the MA on the verbal psychological test.

PROCEDURES

Spontaneous language samples were recorded in two settings, transcribed and analyzed. The Leiter International Performance Scale was administered and results were compared to the test scores achieved on a verbal psychological test. Comprehension of grammatical structures was evaluated by the Miller-Yoder (MY) Test of Grammatical Comprehension.

Table 1. Vital Statistics and Test Scores.

NAME	DATE OF BIRTH	DATE OF ADMISS.	VERBAL IQ TEST*	DATE	(mos) MA	IQ	PPVT (mos) MA	PPVT*** IQ	ITPA*** (mos) PLA
1. Mary	8/3/69	8/12/70	SIT	1975	40	56	30	24	34
2. Lisa	3/3/67	4/5/71	S-B	1974	43	48	45	48	46
3. Susie	3/18/62	8/17/65	SIT	1975	60	38	32	14	40
4. Kathy	10/2/60	8/28/64	SIT	1972**	51	37	50	34	52
5. Randi	12/17/58	7/6/61	S-B	1974	47	25	44	24	54
6. Janice	9/24/54	9/9/55	S-B	1974	45	23	49	34	50

*Administered by Psychology Department.

**In 1974 Kathy was given the Leiter Performance Scale by the Psychology Department.

***Administered by the Speech Department in 1976.

Table 1A. Personal Information

	NAME	
1.	Mary	Illegitimate child. Put in private placement at birth. No family interest or visiting. Taken occasionally for a day by employee.
2.	Lisa	Taken home after birth but family immediately requested placement in state institution. History of ambivalent feelings in family. Periodically "boarded out" with anyone who would take her. Before coming to the institution, she was in a Purchase of Care placement for a while. For the last two years, family has been taking her home for weekends and has shown consistent interest.
3.	Susie	Put in private placement at birth. No family interest. No visits.
4.	Kathy	Put in private placement at birth. Could not continue there and taken home from January 1963 until there was an opening at the institution. No family interest. No visits.
5.	Randi	Put in private placement at birth. No family interest. No visits.
6.	Janice	Taken home at birth. No family interest since institutionalized. No visits.

Language Samples

The study required a representative language sample from each subject. It was desirable to get as large a sample as possible within a relatively short period of time. Longhurst and Grubb (1974) found "significant differences" among the language samples collected in four different treatments for the four linguistic measures they used. The "less structured, conversational setting generally elicited language of greater quantity and complexity than the more structured task-oriented setting." Accordingly, the recording sessions were designed to be as informal as possible with a conversational format. The conversation was to be conducted by a person well-known to the child and familiar with her daily routine. A language sample was taped for each child in two different settings:

1) with her classroom teacher in school.
2) with a familiar attendant or housemother in the cottage.

Before each taping session the nature and purpose of the study was described and discussed with the teacher or housemother. In the pretaping orientation, it was emphasized that the format was not to be that of a lesson, nor of the usual question-and-answer type of exchange. The teacher or housemother was to attempt to have a conversation with the child. Written instructions were also supplied and read as follows:

"Guidelines for Conducting a Speech Taping Session

1. The most important thing to remember is that we are looking for a SPONTANEOUS speech sample. This means that we would like to catch on tape a sample of the child's speech which is exactly the same as it would be if the recorder and the examiner were not there or could be made invisible.

2. The topic of conversation may be ABSOLUTELY ANYTHING. You may let the child initiate the conversation and let it go wherever it will, or you may introduce a subject which you know to be of interest to the child. It is perfectly permissible to bring up subjects already discussed, or to have materials of any kind which you think will prompt the child to talk. Set up a situation which your experience has shown will stimulate increased verbalization.

3. Since the object is to get as much spontaneous, intelligible speech as possible, in this case it will be permissible to have the child "carry news," "tattle-tale," use "bad words," etc. without being reprimanded. As a matter of fact if this would encourage more speech she should be encouraged!!!

4. Questions which lead to one-word answers should be avoided. As a matter of fact, the format should not be that of a "lesson," i.e. question-and-answer, but rather of a conversation, of a give-and-take.

5. Since we recognize how difficult it is to maintain a conversation with such low-verbal children, we would encourage you to engage actively in doing something with the child. You may assign her a job in some project and then show her what she is expected to do; a teacher might look through a scrapbook with pictures of a trip the class took and discuss what they saw and did; or a cottage mother might ask the child to help her in doing some job, such as hanging up clothes or sorting out shoes, etc.

6. The taping session will take about 30 minutes. Please be careful not to talk while the child is talking."

The experimenter was the only other person present at the taping session and took part freely in the conversation, while keeping the focus on the teacher/child or housemother/child dyad. It should perhaps be noted that the experimenter was well known to

all the children, teachers and cottage personnel. No specific topics or materials were supplied other than the very general suggestions in the written instructions. Each teacher or housemother decided on her own format. Some had a variety of materials; others had none.

At each taping session, one-half hour of conversation was recorded. The experimenter noted all situational cues so that interpretion of the speech and intent would be facilitated. In practice, almost all of the children's comments were echoed, interpreted, or questioned immediately. Because of the extreme deviancy of their articulation and the difficulty in understanding them, this type of exchange is "normal" in speaking to these children.

All the tapes were transcribed by the experimenter. Those portions which were (a) unintelligible, (b) partially intelligible, or (c) questionable were then played back either to the teacher or housemother who had recorded the interview, if she was available, or to the staff of the Speech Department, all of whom were familiar with the subjects and their speech patterns.

Each utterance was thereafter marked with a code as being either: (a) intelligible, (b) partially intelligible or (c) unintelligible.

After the entire tape had been transcribed and interpreted a fifteen-minute portion was selected for detailed analysis according to the theory of language development expounded by Roger Brown in "A First Language," (1973). Those portions of the tape were selected for analysis in which the child produced the most language

quantitatively and qualitatively. In no case, however, was a sequence of less than five minutes analyzed. Consequently, the analysis consisted of either three five-minute selections, one fifteen-minute selection or some variation of these. The purpose of this procedure was to allow flexibility in the choice of those sections which represented the child's best efforts at communication. Each page of the transcription chosen for analysis was coded on a form reproduced in Table 2.

Each utterance was categorized as representing (a) one of the eight basic semantic two-term relations, (b) one of the "other" two-term constructions, (c) one of the three-term relationships, or (d) four-or-more-term relationships. In addition, count was kept of the use of the negative, question and imperative modes, of the occurrence of incorrect word order, or the use of catenatives and of the appearance of the fourteen modulations said to characterize Stage II; count was kept of the number of echoic responses and of responses which did not fit into any of the specified categories.

There were many problems associated with the analysis. Some general "rules" were adopted as guides in making the morpheme count and as determinants of constituent status.

Since the Mean Length of Utterance was computed in terms of morphemes, it was necessary to determine what morphemes would be credited. Such a decision could not be made merely on a count of the number of appearances of a certain construction. It involved a decision on whether the morpheme could be said to be

Table 2. Analysis Sheet

Name Situation: M.L.U._____ P.

Total No. of utterances ____
No. of confirming "yeah" and "no" ____
No. other single word utterances ____
No. partially intell. 2 or more words ____
No. unintelligible ____
No. echoic 2 or more words ____
No. Analyzable Utterances ____

2-term Relations:

1. Agent-Action ____
2. Action-Object ____
3. Agent-Object ____
4. Action-Locative ____
5. Entity-Locative ____
6. Possessor-Possession ____
7. Entity-Attributive ____
8. Demonstrative-Entity ____
9. Miscellaneous ____

Modes:

1. Negative ____
2. Question ____
   "Wh" word ____
   Word Order Reversal ____
3. Imperative ____

Occurence of Incorrect Word Order ____
Catenatives: _____

Other Constructions:

Instrumental ____
Benefactive ____
Conjunctions ____
Classificatory ____
Dative-Indirect Obj. ____
" Experiencer or Pers. Affected ____

No. of more than 3 constit. utterances ____

3-term Relations:

Agent, action, object ____
Agent, action, locative ____
Agent, object, locative ____
Action, object, locative ____
Other ____

4-term Relations:

Agent, action, object, locative ____
Other ____

Modulations:

Present Progressive ____
Prepositions (in & on) ____
Articles ____
Past Irregular ____
" Regular ____
Auxiliaries - Uncontractible ____
Auxiliaries - Contractible ____
Plurals ____
Possessive Inflection ____
Copula Uncontractible ____
" Contractible ____
3rd Pers. Sing. - Irregular ____
3rd Pers. Sing. - Regular ____

Other Notations:

used productively or whether it was a learned "chunk." For example, the contracted form of the negative appeared very frequently, but like young normal children (Brown, 1973), the subjects used this construction not as a contraction but as a whole negative word. Therefore negative contractions such as "don't" and "can't" were counted as one morpheme since there was no evidence that they were perceived as other than single words. Other "rules" for counting morphemes were:

(a) No separate morpheme credit was given for the past tense form of a verb unless the present tense form of the verb also appeared: e.g. "say-said," "give-Gave."

(b) No separate credit was given for the plural form of a word which habitually is used as a plural unless the singular also appeared: e.g. "play jacks," "glasses," etc.

(c) No separate credit for contracted forms such as "it's," "that's," "I'm," "I'll," which occurred occasionally since there was no evidence that they were perceived as other than single words.

The "rules" for constituent status for constructions not specifically dealt with in Brown's schema were:

(a) "wh" question words were usually counted as separate constituents except for such constructions as "how about you, Miss H.?" which were construed as pre-learned "chunks."

(b) Relative pronouns were counted as a separate constituent in constructions such as "I know who's going" when they supplied the agent of the subordinate clause, but not in constructions like "you know what a holder is" when they served only a formal grammatical role.

(c) Adverbs of time, manner and number were counted as separate constituents.

Another often knotty problem was the determination of whether a verb was an action verb or a state verb. Very young normal children use few state verbs and Brown did not include them among his semantic relations. However, our subjects used many such verbs, and it was not always easy to determine whether a verb fell into one category or the other (Brown, pp. 320-328): "get fat," "take a shower," "my finger stuck," "see doctor" (in the sense of visiting the doctor), "I sleep on the floor." Each example was considered separately and a decision reached on the basis of the guiding principles enunciated by Brown.

The following "rules" which, in general, were in accordance with Brown's guidelines were adopted for computing the mean length of utterance:

(a) All utterances were included except those which were coded as Unintelligible. The words which could be understood in Partially Intelligible utterances were counted.

(b) Echoic utterances were counted because, as explained above, p. 49, the subjects' articulation is so deviant that the "normal" pattern of conversational exchange is to question or echo each response. Then the child, in turn, frequently affirms or denies the interpretation by echoing it in part or whole.

(c) Rote counting or spelling or singing were not included.

(d) The catenatives such as "gonna" and "wanna" were counted as single morphemes.

(e) Auxiliaries were counted as separate morphemes as were the inflections for the progressive, third person singular, etc.

Other Tests

In addition to the language sample, a psychological measure based upon performance and a comprehension test were included so as to provide standardized, objective evaluations of language parameters by other means than the subjects' verbal expressive abilities.

A. Leiter International Performance Scale

As noted in the review of the literature, many researchers have concluded that Down's Syndrome individuals are particularly handicapped in the area of language development. Nevertheless, the mental capacities of these people are often judged by tests which rely heavily on verbal understanding and usage. At the institution, the Psychology Department tests each resident periodically according to a schedule prescribed by the state and dependent upon age, length of institutionalization and IQ level. The most frequently administered tests are the Stanford-Binet and Slosson Intelligence Test. The SIT can be administered in 10-20 minutes and studies carried out by the author and others show high correlations with the SB-LM. These range from .90 for normal subjects of CA four years to .97 for normal subjects of CA 18 years and up. The author warns, however, that below the MA of four this test suffers from the same loss of validity as do all other intelligence tests (Slosson, 1963).

In order to determine whether a non-verbal test would yield different results, each of the six subjects was given the

Leiter International Performance Scale. This test, of course, was specifically designed to circumvent the need for any verbal comprehension or expression. It does, however, require a high level of perceptual and motor skills. The Leiter yields both an IQ score and an MA. The results of the verbal intelligence test and the performance scale were compared.

B. Miller-Yoder (MY) Test of Grammatical Comprehension (1975).

This test was designed specifically to test the comprehension of certain grammatical structures by a retarded population. It was included in the study to confirm and supplement the evidence provided by the spontaneous language sample. Subjects are asked to choose the appropriate picture from a page with four line drawings, one of which represents the test sentence. There are 42 sentence pairs, or a total of 84 sentences. The sentence pairs differ only in the grammatical aspect under examination, i.e.

"Spot stands on the bed."

"Spot stands under the bed."

The grammatical constructions tested are:

1. Active (subject/object)
2. Preposition (on/under; in/beside)
3. Possessive (noun inflectional ending)
4. Negative/Affirmative Statements
   (has/doesn't have; can/can't; is/is not)
5. Pronoun object and subject
   (her/them; him/her; him/them; he/they; she/they; he/she)

6. Singular/Plural noun and verb
   (noun/verb inflections; verb is/are and "ing")

7. Verb inflections
   (pres. prog/future; pres. prog/past;
   future/past)

8. Modification, object and subject
   (object: little/big; red/green)
   (subject: little/big; blue/black)

9. Passive reversible

10. Reflexivization

The test has not been standardized and does not yield a score. However, the authors conducted a pilot study with 48 trainable mentally retarded persons with IQs between 25 and 50. They found increasing comprehension as the subjects' chronological age increased.

This test was administered twice to each of the subjects in the present study, once by the experimenter and a second time, at least a month later, by another staff speech pathologist.

CHAPTER IV

RESULTS

The results of the study will be discussed in the following order: (1) Leiter International Performance Scale, (2) Language Sample, (3) Miller-Yoder Test of Comprehension.

1. The Leiter International Performance Scale is presented first since it contributes to the basic description of the subjects, and, in effect, supplements the information already presented in Chapter III.

2. Language Sample. Analysis of the language sample is given in considerable detail and forms the bulk of the data. The thirty-minutes of tape-recorded conversation obtained from each child in separate sessions with her teacher and cottage personnel was subjected to statistical and theoretical analysis and is extensively described and illustrated. Correlational analyses were done to compare the relationships between CA, MA and the number of analyzable utterances. Each of these, in turn, were related to the frequency of usage of the basic two-term semantic relationships. Other correlational studies compared CA, MA and the number of analyzable utterances with the number of negatives, questions and imperatives (Table 3). Analyses of Variance compared the Mean Length of Utterance (MLU) in the two conditions in which the conversations were recorded, i.e. with the teacher in the classroom and with cottage personnel in the cottage. Other relationships

Table 3. Matrix of correlational values.

	Chronological Age (CA)	Mental Age (MA)	No. Analyzable Utterances	Leiter Performance Scale	Verbal IQ Score	Agent-Action	Action-Object	Agent-Object	Action-Locative	Entity-Locative	Possessor-Possession	Entity-Attributive	Demonstrative-Attributive	Miscellaneous	Negative	Question	Imperative
CA		.33	.84*			.01	-.56	00	-.89	-.50	-.50	-.46	-.12	-.23	-.18	-.34	-.67
MA			-.19			.51	.37	00	.09	-.27	-.71	-.24	.43	.33	-.23	-.28	-.47
No. Analyzable Utter.						-.45	-.69	00	-.93**	-.19	-.11	-.55	-.49	-.42	.09	-.04	-.59
Leiter Perform. Scale					.66												

* .05 level of significance

** .01 level of significance

which were also explored by analysis of variance were (a) the two conditions (teacher and cottage personnel) vs. the frequency of occurrence of two-term, three-term, four-term, five-term and six-term utterances; (b) the two conditions vs. the frequency of occurrence of non-expanded terms; (c) the two conditions vs. the frequency of occurrence of expanded terms; (d) the relative frequency of occurrence of those constructions identified by Brown (1973) as "Other" constructions.

The discussion of the fourteen morphemes which are said to emerge at Stage II, is descriptive and theoretical rather than statistical because the primary interest here is in the presence or absence of each of the modulations and of the manner in which they are used. Statistical analysis involves comparisons among variables to determine differences or similarities whereas interest here is in how each of the modulations is or is not employed where required.

3. The Miller-Yoder Test of Comprehension complements the language sample by providing an objective evaluation of the subjects' understanding of certain grammatical structures. The results are presented in Table 20 and the implications are discussed.

LEITER INTERNATIONAL PERFORMANCE SCALE

In order to present as complete a profile of the subjects' intellectual status as is possible and in order to avoid penalizing them by presenting only the results of verbal IQ tests, the Leiter Scale was administered to each subject individually by the experimenter under the supervision of the school psychologist. The

results are displayed in Table 4, side by side, for convenience, with the results of the verbal intelligence test.

Correlations between the two tests (performance vs. verbal) $r(4) = .66$ showed that there was no statistically significant relationship between them in this study. With only six subjects an r of .81 is required to obtain a significant relationship. A comparison of the means of the Leiter and the verbal scales by a t-test indicated no significant differences in MA scores (Leiter MA mean = 44.5 mos.; verbal test MA mean = 47.67 mos.).

Table 4. Leiter International Performance Scale compared to verbal intelligence scales.

		LEITER SCALE		VERBAL SCALE	
SUBJECTS	CA (mos.)	IQ	MA (mos.)	IQ	MA (mos.)
1. Mary	70	No Basal - No Ceiling		56	40
2. Lisa	99	41	45	48	43
3. Susie	159	38	60	38	60
4. Kathy	176	25	39	37	51
5. Randi	198	35	54	25	47
6. Janice	248	36	54	23	45

Comparison of the MA on the Leiter and the verbal intelligence test shows that Mary's best score was on the verbal intelligence scale whereas her Leiter could not even be scored because she did not achieve a basal level. There was only two months' difference on Lisa's verbal and performance scales with the Leiter having the advantage. Susie's two scores were exactly the same. Kathy's

verbal scale score was twelve months higher than the performance scale score. Both Randi and Janice scored higher on the Leiter with their verbal scale MAs being seven and nine months lower respectively.

In the light of these results one can certainly not come to the a priori conclusion that Down's Syndrome subjects are unduly penalized by a verbal intelligence test. Other contributing factors would appear to be chronological age and the degree of perceptual-motor impairment.

LANGUAGE SAMPLES

After being transcribed, each language sample was analyzed and the results recorded page by page on an Analysis Sheet such as is shown in Table 2, p. 51. Across all subjects there were 2,507 utterances of which 1,110 were analyzable utterances. An analyzable utterance was defined as an intelligible utterance of two or more terms. Table 5 gives the total number of utterances for each child in the two fifteen-minute segments, the number and percentage of analyzable utterances, and the number of unintelligible and partially intelligible utterances, as well as the combined percentage of these last two categories. Analyzable utterances and intelligible utterances are not the same because all one word responses were excluded from the count of analyzable utterances. None of the partially intelligible and, of course, none of the unintelligible utterances were analyzed in terms of their semantic and grammatical structure. They were also excluded from the count of analyzable utterances. The words which could be understood in

Table 5. Total number of utterances, number and percentage of analyzable utterances and other utterances, partially intelligible and unintelligible.

UTTERANCES	MARY	LISA	SUSIE	KATHY	RANDI	JANICE
Total No. of Utter.	302	447	288	395	515	560
No. Analyz. Utter.	110	176	124	185	221	294
% Analyzable Utter.	36%	39%	43%	47%	43%	53%
No. Partially Intell.	37	10	21	23	28	63
No. Unintell.	39	6	13	13	16	4
% Combined Part. Intell. and Unintell.	25%	4%	9%	9%	9%	12%

the partially intelligible responses were included in the word count to determine the Mean Length of Utterance, which will be discussed below. The relatively low percentage of Unintelligible and Partially Intelligible utterances recorded in Row 6 of Table 5 may be somewhat misleading and should not be taken as indicative of the conversational intelligibility of the subjects. This degree of intelligibility was achieved only because the experimenter and other members of the staff listened and re-played each utterance again and again so that every utterance was deciphered, if it was at all possible to do so.

Correlational analyses revealed a positive relationship between the number of analyzable utterances and chronological age,

r (4) = .84, $p < .05$. Thus as the subjects' age increased, so did the number of analyzable utterances. No significant relationship existed between MA and the number of analyzable utterances suggesting that these two factors were not related to each other in this study. There was also no significant relationship between MA and CA.

Mean Length of Utterance

The Mean Length of Utterance for the six subjects in the two conditions was 2.0, supporting Hypothesis A which stated that early institutionalized Down's Syndrome individuals by the time they reach adulthood have mastered the same level of linguistic development as the normal Stage I child. The typical Stage I child attains an MLU of 2.0. Five of the six subjects of the study had MLUs at or below the hypothesized threshold (Table 6). Janice, the oldest, with an MLU of 3.0 is at Stage III. The range of MLUs among the remaining five subjects is very narrow, from 1.6 to 2.0, with a mean of 1.8.

Table 6. Mean length of utterance in two conditions (teacher and cottage personnel).

CONDITIONS CA (mos.)	MARY 70	LISA 99	SUSIE 159	KATHY 176	RANDI 198	JANICE 248	MEAN
Teacher	1.4	1.6	1.5	2.1	1.9	2.8	1.8
Cottage	1.9	1.8	2.0	2.0	1.8	3.3	2.1
Mean	1.6	1.7	1.7	2.0	1.8	3.0	2.0

A two-way Analysis of Variance (Table 7) comparing the mean Length of Utterance across the six subjects and two conditions (teacher and cottage personnel) yielded an F (5,5) = 12.89 which

is significant at the .01 level ($p < .01$) indicating a significant difference among the subjects' performance. A Tukey B test of multiple comparisons showed a significant difference between Subject 6 (Janice) and all the other subjects ($p < .05$) on the Mean Length of Utterance variable. It also showed that all the other subjects did not differ significantly from each other in this respect, indicating that the significant difference among subjects was due to Subject 6. The Analysis of Variance also showed that the two conditions differed from each other marginally, F (1,5) = 4.31, $.10 < p > .05$, with the MLU somewhat larger with cottage personnel than with the teachers.

Table 7. Mean length of utterance. Analysis of variance: Subjects x Conditions

SOURCE	DEGREES OF FREEDOM	SUM OF SQUARES	MEAN SUM OF SQUARES	F	p
A	5	2.804	0.560	12.89	.01
B	1	0.187	0.187	4.31	
Error	5	0.217	0.043		
Total	11	3.209			

It is interesting to compare the longest utterances of our subjects with the upper bound target values set by Brown (1973). As can be seen in Table 8 four of our subjects exceeded the upper bound target for Stage I, and the oldest subject, with an upper bound of twelve morphemes falls between Stage IV and V. In this respect the Down's Syndrome subjects differ from normally developing Stage I children. However, in terms of their Mean Length of

Utterance (MLU) the Down's Syndrome subjects fall within the confines of Stage I.

Table 8. Comparison of Brown's (1973) upper bound target values and actual upper bound values of Down's Syndrome subjects.

BROWN'S TARGET VALUES		DOWN'S SYNDROME SUBJECTS	
STAGE	UPPER BOUND	NAME	UPPER BOUND
I	5	Mary	4
II	7	Lisa	7
III	9	Susie	5
IV	11	Kathy	8
V	13	Randi	8
		Janice	12

Two-Term Relations

All the children used all of the eight basic two-term relationships postulated by Brown (1973), with the exception of the Agent-Object relationship. Brown (p. 194) notes that "the agent-object relation was the most marginal in the set of elementary relations: it did not turn up at all in five samples." In this study it occurred only once in the data for Subject 3 (Table 9).

Subject 3, Susie, also has a zero value in the Possessor-Possession cell. Nevertheless, she did express this relationship in an expanded noun phrase (NP), "by my bed" which was coded under "Miscellaneous" relations. "Miscellaneous," the ninth two-term category added to Brown's basic eight semantic relationships

Table 9. Number of times two-term relations appeared and the proportion of each to the number of analyzable utterances.

RELATIONS No. Analyz. Utter.	MARY 110		LISA 176		SUSIE 124		KATHY 185		RANDI 221		JANICE 294	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
A. Basic Eight												
1. Agent-Action	10	9	12	7	15	12	27	15	6	3	12	4
2. Action-Object	11	10	28	16	26	20	6	3	10	5	5	1
3. Agent-Object	0	0	0	0	1	.8	0	0	0	0	0	0
4. Action-Locative	2	2	4	2	2	2	2	1	3	1	1	.3
5. Entity-Locative	2	2	11	6	3	2	3	2	7	3	4	1
6. Possessor-Possession	6	5	10	6	0	0	2	1	12	5	4	1
7. Entity-Attributive	37	34	11	6	20	16	27	15	38	17	32	10
8. Demons.-Attrib.	4	4	1	.5	7	6	1	.5	8	4	4	1
B. Miscellaneous (including 'Other Constructions)	20	18	34	19	27	21	32	17	51	23	41	13

included a variety of constructions. "Miscellaneous" included Brown's "Other" constructions, i.e. instrumental, benefactive, conjunctions, comitative, classificatory, dative-indirect object and experiencer-person affected. "Miscellaneous" included, as well, constructions not found in Brown's data but occurring among the utterances of the subjects in this study. Foremost among such constructions were fully developed prepositional phrases coding place, time, etc. For example, there were phrases such as "in my box," "under the picnic table," "by the bridge." Such phrases did not fit into either the Entity-Locative or Action-Locative categories. They could be considered as expressing a single relation, the locative, but this does not seem fair. It would not give credit for the much more complex construction which the child is using. Moreover, it is the same type of syntactic construction as the comitative (with my mommy) or benefactive (for my mommy) which are treated as two-term relationships. Such phrases, therefore, were coded under the "Miscellaneous" category. Among the other types of two-term relationships counted in this category were expressions such as the following: "like this," "like that" (demonstrating an action), "wear it," "no have it"(stative verbs), "try again" and "now better" (time), "is supper" (copula verb), "you too" (agent plus adverbial).

Table 9 records the frequency of use of each of the two-term relations; first the basic eight semantic relations, then the "Miscellaneous" category which, as stated, included the sum of Brown's seven "Other" constructions plus those discussed above.

Correlational analyses showed no significant relationship between each subject's verbal MA and the frequency of appearance of any of the nine classes of two-term relationships (basic eight plus Miscellaneous). When CA was compared with these same nine two-term relationships, the only significant correlation which emerged r (4) =-.89, $p < .02$, was between CA and Action-Locative. As CA increased, Action-Locative decreased in frequency of occurrence, whereas multi-term relationships increased. When the nine relationships were compared with the analyzable utterances, again the only significant correlation r (4) = -.93, $p < .01$ was between analyzable utterances and Action-Locative. As there were more analyzable utterances for a subject, there were proportionately fewer occurrences of the action-locative relationship. Further, chi square analyses of these data confirmed the lack of consistent relationship between MA and the nine semantic relationships. Chi square analysis comparing positive and negative correlations showed that there were fewer positive correlations, $\chi^2(1) = 5.00$, $p < .05$ indicating that as the subjects got older, they were using fewer of the nine basic two-term relationships. Similarly, as there were more analyzable utterances, there were fewer occurrences of the basic two-term semantic relationships indicated by a $\chi^2(1) = 8.00$, $p < .01$. These two-term relationships were supplemented and replaced by three, four, five and six-term relationships.

In summary, although the mean length of utterance of the subjects did not rise above 2.0, the complexity of their utterances rose steadily and as they grew older they used fewer two-term relationships and more multi-term relationships.

Multi-Term Relationships

A two-way Analysis of Variance between conditions (teachers vs. cottage personnel) and among terms (two-term through six-term) showed no difference between conditions. There was a significant difference in the frequency of occurrence of the different terms, F (4,50) = 42.40, $p < .01$. There was no significant interaction between the two variables. A Tukey B test showed that the two-term constructions were used more often than the three-term constructions and that both of these constructions were used more frequently than the four, five, and six-term constructions ($p < .01$) which did not differ from each other significantly. In other words, two-term > three-term > four-term = five-term = six-term relationships (Table 10).

Table 10. Relationship of conditions to terms (two-term through six-term).

SOURCE	DEGREES OF FREEDOM	SUM OF SQUARES	MEAN SUM OF SQUARES	F	p
A	1	375.00	375.00	2.61	NS
B	4	24348.60	6087.15	42.40	.01
AB	4	982.00	245.50	1.71	NS
Error	50	7178.33	143.57		
Total	59	32883.93			

The unfolding of the simple two-term construction into a multi-morpheme construction is discussed by Brown at some length: Characteristically, this is accomplished in two different ways: (a) a third term is added or (b) the noun phrase (NP) is expanded.

These two types of complexities emerged simultaneously in Brown's normal young subjects.

In the present study a comparison was made between the DS subjects' use of the basic two-term, three-term, four-term, etc. relationships and their use of expanded NPs within such relationships.

The two-way Analysis of Variance (Table 11) between conditions (teachers vs. cottage personnel) and terms (non-expanded) showed again no difference between conditions and no interaction. However, there was a significant different between terms F (4,50) = 43.94, $p < .01$. A Tukey B test resulted in 2 > 3 > 4 = 5 = 6. There were more non-expanded two-terms than three terms and more three-terms than four-terms. There was no difference in the frequency of occurrence of the remaining non-expanded terms.

Table 11. Relationship of conditions to non-expanded terms.

SOURCE	DEGREES OF FREEDOM	SUM OF SQUARES	MEAN SUM OF SQUARES	F	p
A	1	16.02	16.02	0.30	NS
B	4	9536.57	2384.14	43.94	.01
AB	4	211.23	52.81	0.97	NS
Error	50	2713.17	54.26		
Total	59	12476.98			

When terms with expanded NPs were compared in a similar Analysis of Variance (Table 12) the results showed again that conditions did not differ but terms did, F (4,50) = 12.15, $p < .01$.

The two and three-term expansions occurred with equal frequency, but greater than the four, five and six-term expansions. The subjects in this study, therefore, were using two and three-term constructions and two and three-term expanded constructions more frequently than four, five and six-term constructions and expansions.

Each of the above analyses and comparisons were repeated with five subjects, excluding Janice, who, with an MLU of 3.0 was more advanced than the others. The results replicated the above findings in that significant differences and relative performance remained the same and no new effects were revealed.

Table 12. Relationship of conditions to expanded terms.

SOURCE	DEGREES OF FREEDOM	SUM OF SQUARES	MEAN SUM OF SQUARES	F	p
A	1	268.82	268.82	3.59	NS
B	4	3636.07	909.02	12.15	.01
AB	4	302.93	75.73	1.01	NS
Error	50	3739.83	74.80		
Total	59	7747.65			

For comparative purposes it is noteworthy that the normally developing children in Brown's study did not use any four, five or six-term relationships at Stage I. In this respect the Down's Syndrome children differed from the normal children.

Brown's "Other" Constructions

Brown (1973) analyzed the language samples of twelve normal children learning their first language. In addition to English, the languages represented were Swedish, Mexican Spanish, Finnish and Samoan. At the time the language samples were taken by the various authors all the children were at Stage I with MLUs ranging from 1.10 to 2.06. Seventy percent of their utterances, according to Brown, could be ascribed to one of the eight minimal semantic relations which have been discussed. There were, however, "other constructions" which appeared with frequencies ranging from 4% to 65% for individual children. Brown attributes these constructions to relations which may be within the competence of the Stage I child, but which appeared infrequently in the data as a whole, or which may represent the first "and apparently uncomprehending use of forms which will become fully productive in Stages II and III," or which may be "idiosyncratic forms" used by a few children. These constructions constitute the category which Brown called "Other Constructions."

Table 13 gives the number of occurrences of these "Other" constructions by the Down's syndrome institutionalized subjects in all their utterances (two-term, three-term, etc.). Analysis of Variance of these data (Table 14) shows a significant difference in the percentage of usage of these constructions, F (6,35) = 10.70, $p < .01$. A Tukey B test showed that there was a higher percentage of use of the construction "Experiencer or Person Affected" than any other construction. The construction "Experiencer or

Table 13. Number of "Other Constructions" and the proportion of each to the number of analyzable utterances.

OTHER CONSTR.	MARY		LISA		SUSIE		KATHY		RANDI		JANICE	
Analyz. Utter.	110		176		124		184		221		294	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Instr.	1	.9	1	.5	0	0	0	0	0	0	1	.3
Benef.	0	0	0	0	0	0	2	1	0	0	1	.3
Conj.	0	0	0	0	2	2	12	6	13	6	14	5
Comit.	0	0	0	0	0	0	0	0	0	0	8	3
Class.	0	0	0	0	0	0	0	0	0	0	3	1
Dat.-Ind. Obj.	1	.9	2	1	0	0	6	3	23	10	16	5
Exp.-Per. Aff.	6	5	39	22	5	4	63	34	37	17	75	26

Table 14. Relative frequency of occurrence of "Other Constructions."

SOURCE	DEGREES OF FREEDOM	SUM OF SQUARES	MEAN SUM OF SQUARES	F	p
Between	6	1509.67	251.44	10.70	.01
With	35	822.67	23.50		
Total	41	2331.33			

Person Affected" was the subject of a stative verb. It is interesting to note that whereas Brown found this construction to be "fairly common," in this study it was very common. The other constructions did not differ from each other in percentage of occurrence. The high frequency of occurrence of Experiencer-Person Affected constructions with state verbs is another area in which these DS subjects differ from normal Stage I children.

Negative, Question and Imperative Modes

A. Negative

There were no significant correlations between the use of negatives, questions and imperatives and CA, MA and the number of analyzable utterances. Although all correlations for these nine comparisons were negative, chi square analyses between the three modes and CA $\chi^2(1) = 3.0$, $.10 > p > .05$, produced only marginally significant differences between negative and positive correlations since there were only three modes for comparison which cannot produce a significant difference, i.e. a difference at the .05 level of confidence. In the same vein although eleven correlations were negative between the three modes and MA, chi square analyses produced marginally significant differences between negative and positive correlations $\chi^2(1) = 3.0$, $.10 > p > .05$. There were no significant differences between positive and negative correlations in the comparison of the use of the three modes and the number of analyzable utterances.

Table 15 gives the proportion of negatives, questions and imperatives used by the subjects in relation to analyzable utterances. This does not account for single word responses which were used to express these meanings, especially the negative.

The percentage of negative statements was higher than either the questions or imperatives except in the case of Susie (Subject 3) who had more imperatives than negatives. The total absence of questions by this same Subject and the scarcity of questions and imperatives in the oldest subject, Janice, is note-

Table 15. Proportion of two-term negative, question and imperative utterances in relation to the number of analyzable utterances.

CONSTRUCTIONS	MARY	LISA	SUSIE	KATHY	RANDI	JANICE
Negatives	.09	.18	.06	.19	.09	.10
Questions	.02	.09	00	.12	.04	.01
Imperatives	.06	.03	.10	.04	.06	.006

worthy. Moreover, these modes were not expressed by the subjects by any gestural behavior, and rarely by single words.

The range of negative expressions for the group was rather wide. It included both correct and incorrect or immature ways of expressing negation. Non-existence, rejection and denial were all expressed. The responses are not analyzed in terms of these categories because beyond the earliest negatives other meanings appear to be encoded. It certainly seems a stretch of the meaning of non-existence to thus classify "no stand up," "I no reach it," "doesn't fit" as Bloom did (Bloom 1970).

The terms used by the DS subjects ranged from a simple "no," or "nope" or "nah" to frequent use of the catenative "dunno," through an occasional "nothing" and "nobody" to some full complex negative embedded sentence like "I don't know how to do it."

Mary, Subject 1, with an MLU of 1.6 produced 10 negative utterances longer than a single word. One of her single words was "nothing." Half of her multi-word negative utterances were some phonetic version of "I dunno." Other expressions of denial were

"ɔ no cry" and 3 repetitions of "no have it." There was one rejection "ɔ̃wa da" (I don't want that), where the negative was expressed by an elongated nasal after the initial vowel.

Lisa, Subject 2, with an MLU of 1.7 had 32 multi-word negative utterances, some of them complete forms such as "I can't," "I don't want the coverall on me," "I don't like that," "It's not wet," "I'm not tire(d)" and "you can't play card." However, she also said "no have card" and "no take dress off," "no take that," "not hungry." Lisa had many repetitions of "I dunno" and three times she said "I like that dog" where the negative was expressed by an elongated nasal after the initial vowel, much like Subject 1.

Susie, Subject 3, with an MLU of 1.7 had 8 negative multi-word expressions of which five were "I dunno." Susie also said "can't do it" and "no more" which was meant as an admonition, i.e. don't do it any more.

It may be noted here, as will become apparent with the older subjects, that none of them used "any" or "anymore" or "anything." Where these should have been used, there was a double negative.

Kathy, Subject 4, with an MLU of 2.0 used 35 multi-word negative expressions. She had a relatively well-developed and extensive repertoire of negation which she used appropriately, even to her annoyed "you don't know nothing." She used the negative operator "don't" in the present and past tense, but did not inflect it for the third person singular. Some of her sentences were: "I don't care," "I don't wanna," "I don't like it," "I

don't know why," "I didn't wanna," "we don't know" and "B. don't know." It may be noted that all of these were "state" verbs. Kathy used a negative question with reversal of the auxiliary and subject position, "don't ja see it?" Moreover, she alone among the subjects used the elliptical, uncontracted form in such sentences as "he do not," again without inflecting for the third person singular. She used this frequently and with variations such as "so do I," "I do" and "do you?" She also used the contracted negative elliptical form as when replying to a question, she answered, "I don't," and in defending herself against an accusation, she said, "no, I didn't." However, these two forms of the negative operator do not always carry information concerning tense in Kathy's linguistic system. She was asked:

"While you were in the hospital, did you have to stay in bed all the time?"

"No, I don't," answered Kathy.

Other negative phrases using the operator "not" were: "not the whole week" (after enumerating the three days she had speech class); "not in here" when asked where she got medicine and "not me," denying that she had said something.

Kathy used "no" or "not" in sentences which would require the copula in standard English sentences: "you not here Monday," "you no here Sunday," and "I not in it." It is interesting to note that Kathy used the copula in questions and in affirmative sentences, though not consistently, but never in negative sentences.

Randi, Subject 5, with an MLU of 1.8, used 19 multi-term negative expressions. In her linguistic system there was apparently free variation between "no" and "don't." She said: "I don't know" and "I don't eat it," but "I no like it," "I no play game," "I no sleep floor" and "I no have glasses." Randi used "nothing" and "want nothing" and "I don't like nothing" to signify that she didn't want any and that she didn't like it (peas) at all. "Not floor" Randi said, to denote proper garbage disposal and "no more sock" to indicate that she had none in reserve.

Janice, the oldest subject, had the highest MLU, 3.0 and used 29 multi-term negative expressions some of which were among the most complex constructions formed by this group. For example, Janice used a dependent conditional clause, "I make this mat n I can't do nothing" which in standard English would translate to: "If I make this mat, I can't do anything at all." Other complex sentences were "I don't know how to wash the clothes," "I don't know how to do it," "I don't use the mower." Like the other subjects, Janice had only the negative operators "don't," "didn't," "no," "not," "nothing" and "can't." "Won't," "isn't" and "ain't" never occurred. Therefore where other negative words would be required by standard English, Janice used one of her negatives, usually "no," "not" or "don't" which appeared to be in free variation, and produced sentences like: "She not coming in," "she no come see me," "I not dryer girls," "I got no money buy a toothbrush," "I don't got assignment." What is most obviously missing

here is the development of "to be" and "to have" both as main verbs and auxiliaries in negative utterances.

There was no restriction on the use of more than one negative operator in a construction: "I didn't say nothing," "no, I didn't do nothing," "I didn't say nothing, Miss Coco." (The meaning of the last sentence was "I didn't say Miss Coco" not, as it might first appear "I didn't say anything to Miss Coco.") However, there was no consistency in this use since she also said, "no, I say nothing." "Can't" was restricted to the expression of inability in such sentences as "can't do it," "I can't pull," "I can't do this mats."

Comparison with Subjects of Bloom's (1970) Study

The negative sentences of the DS subjects may be compared with the negative utterances of the three children whom Bloom (1970) studied at comparable MLUs.

Bloom divides the acquisition of negative structures into two phases. Phase I is characterized by the expression of three semantic categories, nonexistence, greatest frequency, rejection and, less frequently, denial. Bloom states that there was no differentiation in the syntactic structures with which these semantic meanings were expressed. The first sentences used a negative word before nominal or predicate forms. Though the children expressed sentence subjects in affirmative sentences, the added complexity introduced by the negative operator served to reduce the complexity of the surface structure, and sentence subject was not expressed in negative sentences Bloom reports.

At Phase 2 rejection and denial were expressed more frequently and syntactic structure for all three types of semantic sentences increased in complexity. In addition to nominal negation the children in Bloom's study used predicate negation with sentence-subject (usually first-person "I") and expanded predicates with verb and complement expressed. The negative forms used were "no," "not," "don't," "can't" and Eric used "couldn't." Although all three children used the pro-form sentence subjects "it's" and "that's," "the inflectional paradigm of 'be' was not yet productive in the affirmative sentences in the texts." Bloom interpreted these forms as being wholes, not as contractions of the copula "be."

In order to compare the Down's Syndrome subjects of this study with the normal children of Bloom's study, we will examine the negative utterances of Bloom's Gia, Eric and Kathryn at the time their MLUs ranged between 1.42 and 2.84. The individual MLUs of the Down's children in this study ranged from 1.6 to 3.0.

At the earliest stage, Eric was in Phase 1 and used "no" and "no more" in complementary distribution; "no" was used before predicate structures whereas "no more" was used before nouns. Typical utterances were "no more noise," "no more birdie," "no fit." Eric had one "stereotype" phrase, "ə want any shoes" and in two utterances the circumstances implied negation, but no negative operator was expressed, "əfind it," "jə find it."

At Phase 2, Eric was expressing sentence subjects and verbs with complements in affirmative sentences, but these were not yet productive in negative sentences. Structural complexity had not

changed, but the semantic category of rejection emerged as a synthetically productive category. Some of Eric's sentences were: "ə no more light," "no more pieces," "no more people," "no, not blue," "it doesn't fit."

At Phase 2 all three semantic categories were productive for Kathryn and she was expressing a negated predicate including both the verb and predicate complement. She was also expressing sentence subjects. Kathryn used "no" as her predominant negative with marginal occurrences of "can't." Some of her sentences were: "no driver in the car," "no lock door," "no have this," "man no go in there," "Kathryn no like celery," "can't see," "no want this," "ə no want ə go now," "no Daddy hungry."

At the highest level of development within this range, Eric was including sentence subject and verb complement in predicate phrases. The primitive form "no more" which previously had been predominant now occurred only once. Different forms were used to express various semantic functions: "don't" to signal rejection; "not" to signal denial; "can't" and "couldn't," with appropriate tense contrast, to express non-existence of a predicate and "no" the non-existence of objects. Typical sentences were "have no shoes," "didn't see choochoo train," "it doesn't fit in here," "I can't climb up," "they can't go on the door," "I couldn't see them," "don't touch it," "don't drag it next time," "don't fall down, little man," "that's not bridge."

The negative expressions of both sets of subjects are strikingly similar in some ways. They both use essentially the

same negative operators, "no," "not," "don't" and "can't." The three oldest subjects in the present study, especially Kathy and Janice had much more complex sentence structures than the MLU-matched normal subjects in Bloom's study. However, the normal children were already beginning to develop verb declensions, using correct third person singular negatives like "doesn't" which never occur in the retarded subjects.

8. Questions

In discussing the development of the sentence modalities, including interrogation, Brown notes that they have their roots at Stage I but their main development comes in Stage III when MLU is 2.75. At Stage I Brown believes that while children may not produce "well-formed yes-no questions," (as indeed the children he worked with, Adam, Eve and Sarah did not) the yes-no semantic is within their cognitive capacity. A similar conclusion is supported in the present study in that all of the children understood and responded appropriately to many such questions. The older subjects, as will be detailed below, also produced some well-formed yes/no questions.

Among the studies which Brown reviewed, the Stage I children asked "wh" questions which were limited for the most part to the format "What's that?" "Who'at," "'s at" or "Where...." or Where...go."

Mary, our youngest subject, asked only three questions: one was the single word, "what?" and the others were "who did that?" and "what this?"

Lisa posed a great many more questions, ranking second among our subjects in this respect. She frequently asked questions by the device of intonation, as for example, "right here?" "wash my face?", "well?", "my clothes?", "you go home?" Lisa also used "wh" questions: "what's that?" (five times), "what ya doing?" or shortened to "you doing?", "what," and "where is it Miss D.?" However, Lisa's favorite and repeated query was "why" (five times). She was the only one who used this question in the sample, although some of the other children are occasionally heard to say "why." However, Lisa asks "why" persistently and when the question is turned around to her, she answers "'cause. Says so." At the time of this sample it was highly uncertain that Lisa really knew the meaning of "why," and the probability was that she did not understand the connection between cause and effect which her question raised.

Susie did not pose a single question, although the situations in which she was taped presented many opportunities for her to do so. In the taping with her teacher, Susie was playing a bowling game with the teacher and the experimenter who was cheating flagrantly. Although the teacher protested and invited Susie to do the same, Susie never questioned the procedure. She was eager to get on with it, no matter how the game was played. Consequently, she had a large number of imperative utterances, but no questions.

Kathy used the greatest number and variety of questions. Of her 23 questions, 3 included a "wh" word and 8 also showed word order reversal. Kathy asked yes/no questions such as the following,

depending on the intonation pattern to convey the meaning: "erase it?", "you here tomorrow?", "like this?", "this it?", "hot dog sandwich, huh?" She also used word order reversal plus intonation to signal a question: "is that your name?", "do you?", "wanna see me do this?", "don't you see it?" She used a number of "wh" words: "what do you make?", "what is it?", "where is it?", "whose is this? You?", "how you know?" Kathy also had two other "carrier" devices for asking questions, "how about" and "you know," for example, "how about you do that?" and "how about your name?", "you know who?" The stative verb "know" carried a heavy load in Kathy's linguistic system. Most of her complex sentence constructions were built around this verb, and it will be discussed at greater length on page 115. It should also be pointed out that although she used "do you?" appropriately as a tag question twice, it was never incorporated in the more complex sentence structures with "you know." For example she never said, "Do you know what this is?" or "How do you know?" "You know" seemed to function as a unit which could not be broken up, and which almost invariably appeared in sentences in initial position.

Randi asked only eight multi-term questions. She asked "what" alone five times and all of her multi-term questions were with "wh" words, some with word order reversal: "what do you want?", "who said it?", "where your bed?", "how about you, Miss Hub?"

Janice, with the highest MLU (3.0) asked only five questions in the entire text of 560 utterances: "no?", "what?", "how can I make it?", "how do you color this?" and "different two times?" The last

utterance is worthy of some comment. Janice had just been told that she could not color all the time, that she had to do something else, specifically work on her rug. What she wanted to ask was obviously too complicated for her to handle. It might be something like, "do I have to do different things at different times?" So Janice produced an utterance which perhaps could qualify as a "bizarre" construction (Lenneberg et al., 1964) in the sense that it is unique and the constituents are not usually juxtaposed in this way, although it does convey the essence of her meaning. It would certainly be a good example of semantic-cognitive intentions which do not have "normal adequate linguistic expression" (Brown, p. 150).

In conclusion, the majority of the subjects asked few questions. The evidence would suggest that the problem is not that they do not know how to pose a question, but simply that they lack curiosity, or possibly experience has taught them that their questions are not answered. The two subjects who did pose a considerable number of questions used both intonation and "wh" words to formulate their queries.

C. Imperatives

Interestingly enough, Susie, who produced the fewest negatives and no questions, had the largest number of imperatives; however, as explained above, this is attributable to the fact that she wanted to get on with her game.

Most imperatives correctly deleted sentence subject, many were single words such as "look," "see," "wait."

Among multi-word expressions, Mary used "hold it," "cool it" and "here shut up." Lisa commanded, "go home" and "you go home." Susie, anxious to have her turn, during the game with her teacher called, "hurry up," "C'mon," "do it again," "try again." She repeated each of these a number of times during the course of the game so that she totalled 12 imperative utterances. However, in the session in the cottage, where Susie was looking through a story book and playing with a doll, there was only one imperative, "look at that." Kathy had the most complex constructions among the imperatives, "wait a minute," "you find it for me," "let her see" and "hold it here."

Randi, with one exception used only one type of imperative phrase, saying "tell her Hubschman." The only thing that varied was the person to whom the command was given. One of the rare instances of incorrect word order appeared in this category when Randi was asking the housemother to tell the experimenter something and said "tell you" instead of "you tell." Aside from this, Randi also used "C'mon" to get things moving. Janice's only two imperatives were to herself: "let's see" and "lemme see."

If there is any construction which is extensively modeled for these subjects, it is the imperative. Although they did not use the construction very frequently, it seems evident that they know how to use it, if they want to.

Table 16 presents a summary of the constructions used by each of the subjects in her language sample. Taken together, Tables 16 and 17 provide a profile of each subject's linguistic attainments.

Table 16. Summary Table.
Total number of utterances, number and percentage of analyzable utterances and number of different types of constructions.

UTTERANCES & CONSTRUCTIONS	MARY	LISA	SUSIE	KATHY	RANDI	JANICE
Mean Length of Utterance (MLU)	1.6	1.7	1.7	2.0	1.8	3.0
Total No. of Utterances	302	447	288	395	515	560
No. of Analyzable Utterances	110	176	124	185	221	294
Percentage of Analyzable Utter.	36%	39%	43%	47%	43%	53%
No. of Eight Basic Two-Term Rel.	72	77	74	68	84	62
No. of Misc. Two-Term Rel.	20	34	27	32	51	41
No. of Negative Utterances	10	32	8	35	19	29
No. of Questions	2	15	0	23	8	4
No. of Imperative	7	5	13	8	14	2
No. of "other" Constructions	8	42	7	83	73	118
No. of Three-Term Relations	13	59	21	59	68	121
No. of Four-Term Relations	0	4	0	16	9	50
No. of Five-Term Relations	0	1	0	4	5	10
No. of Six-Term Relations	0	0	0	0	0	4

Table 17. Number of occurrences of the fourteen modulations and the proportion of each in relation to the number of analyzable utterances.

MORPHEME No. Analyz. Utter.	MARY 110		LISA 176		SUSIE 124		KATHY 185		RANDI 221		JANICE 294	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Present Prog.	0	0	7	4	19	15	3	2	1	.4	15	5
Prepositions (in & on)	8	7	10	6	18	15	8	4	12	5	24	8
Articles (the & a)	35	32	2	1	19	15	16	9	17	7	44	15
Past Irregular	3	3	3	2	18	15	13	7	9	4	33	11
Past Regular	0	0	1	.5	0	0	0	0	0	0	4	1
Auxiliary-Uncontractible	0	0	0	0	1	.8	0	0	1	.4	13	4
Auxiliary-Contractible	1	.9	8	5	1	.8	16	9	5	2	21	7
Plurals	3	3	3	2	6	5	1	.5	27	12	17	6
Possessive Inflections	0	0	2	1	0	0	0	0	0	0	0	0
Copula-Uncontractible	0	0	1	.5	0	0	17	9	5	2	23	8
Copula-Contractible	0	0	11	6	4	3	0	0	6	3	18	6
3rd Person Sing. Irregular	0	0	2	1	0	0	0	0	1	.4	0	0
3rd Person Sing. Regular	0	0	3	2	0	0	0	0	0	0	5	2

Fourteen Modulations or Grammatical Morphemes

Table 17 records the number of occurrences of each of the 14 modulations (except that the prepositions *in* and *on* are lumped together) for each of the six subjects. The emergence of these modulations, according to Brown, is the major development which characterizes Stage II.

A. Present Progressive

The present progressive appears first developmentally as the morpheme "ing" on the main verb but without the auxiliary "be." All of the subjects in the present study used the "primitive" progressive form and some of the older ones incorporated various forms of "be."

In the thirty-minute sample which was analyzed in detail, Mary did not use any present progressive forms at all, as can be seen in Table 17. However, a check of the remaining thirty minutes of recorded conversation with her turned up four tokens--"sleeping," "running," "eating," and "brushing teeth." Many other opportunities were afforded for the use of this form because a constantly recurring question in any interchange with a child at this level is "What are you doing?" or in looking at a picture, "What is X doing?" It is a structure, therefore, which has a very high frequency of occurrence in the language which the children hear, and to which they are requested to respond. The form is frequently modeled for them and often is the first form of the verb which is systematically taught when the child is learning a new word.

Lisa had seven "ing" forms. She omitted the auxiliary in all instances. In one utterance there was a hint of a schwa: "What ə ya doing?"

Susie used the progressive form most often, 19 times, but many of these were echoed as she and the attendant leafed through a story book and told the story of The Ginerbread Boy. Eighteen of the progressive tokens were the primitive form, but Susie did construct spontaneously her most complete sentence in the entire corpus: "She is making cake." At another point, asked what she was doing as she finished tying her shoe laces, Susie said: "Makin' a tie bow."

The present progressive appeared in three utterances in Kathy's sample: the first was the simple primitive form, "we going;" the second was the primitive form embedded in a complex sentence, "you know they running around over there;" and the third had a contracted auxiliary, "I know who's going."

Randi's sample included only one instance of the present progressive: "holiday my mama coming."

Janice used the present progressive 15 times, 11 times in the primitive form and four times with the contracted auxiliary: "it's making me nervous," "she's crying," "he said we're going Friday," and "he's coming on Sunday." In the first of these phrases, "it's making me nervous," Janice meant to convey a generality, i.e. "it makes me nervous;" however, the subtleties of aspect which different verb forms convey were not a part of her linguistic system.

Janice not only used the present progressive but also the past progressive: "I was crying Sunday," "I was falling saleep and was dream about this," "I was keep in line," "I was sticking in line, honey." This use of "was" is discussed further in the section on the Past Irregular (p. 103) and the Uncontractible Auxiliaries (p. 104). In Janice's linguistic system "was" signalled a past occurrence and could be combined with either the base form of the verb or the progressive. In the last two sentences Janice was assuring her teacher that she had not stepped out of line but had stayed in line, as required.

It should be observed that none of the subjects (with the above-cited single exception by Susie) used the uncontracted present tense forms of the auxiliary "be" which are variable, "am," "are," "is." Only Janice used the past uncontracted form and used only one form, "was," the first person singular. When other forms were required they were omitted and Janice reverted to the primitive progressive: "we cutting grass," "she working in the church with us," "Miss A. not coming in." It is characteristic of these samples that more complete grammatical forms seem to be optional and are in free variation with the more primitive, earlier developing and more incomplete forms. Newer "rules" do not become obligatory and replace the older forms, so it is possible to have "she's crying" and "she working" in the same sample. It may be speculated in connection with Bloom's (1970, 1974) theory of reduction that when there is increased length, syntactic complexity is reduced. This is borne out to some extent in such sentence pairs as "she's crying" vs. "she working in the church with us." However, we have "I praying" vs. "he's coming on Sunday" and "she not coming in" vs. "he said we're going Friday." Lee (1974) observes that "the slow, gradual and inconsistent

emergence of grammatical forms is one of the chief characteristics of children's language development." The D. S. subjects never stopped being inconsistent in the application of the "rules" governing the use of the various grammatical morphemes.

B. Prepositions (in and on)

Mary used "in" once echoing the phrase "in the mouth." Spontaneously she used "on" seven times, always as a verb particle in the phrase "put 'em on" as she was undressing and dressing a doll. Mary also used "off" as a verb particle, with the main verb unexpressed in "pants off." Finally she used the prepositional phrase "with this," semantically coded as "instrumental" and very unusual in Stage 1 children.

Lisa used "in" and "on" ten times. Her most complex utterance was, "I don't want the coverall on me." One of her stock "ready-made" phrases was "I on diet" and "he on diet." (The judgment of which phrases are "ready-made" and which spontaneously formed is somewhat arbitrary and depends on the experimenter's knowledge of the child, the environment and the particular circumstances. Lisa is the only one of these children who goes home regularly.) "From" and "to" were used in echoic phrases. The verb particle "off" was used spontaneously in the phrase "no take dress off" and "with" was used spontaneously in the phrase "he play with my card." In the sentence which Lisa repeated a number of times, "I wait ə my mommy come," the schwa represented the preposition "till." Lisa omitted the preposition in some phrases which clearly required it: "put it garbage" and in answer to a

question about the doggie, "him grandma house." Also, when asked what she was doing with her cards, she said "hold my hand" although just previously, in answer to the same question, she had said "hold my card i' my hand." Evidently, in this case, the repeated questioning served to reduce her response.

Susie used the prepositions "in" and "on" 18 times, seven times as a verb particle in the phrase "put em on," as she too undressed and dressed a doll. Spontaneously, she said "by my bed" and "pulling pants off." She echoed "he ate he all up" and "in back ə line."

Among the eight occurrences of "in" and "on," Kathy had one inappropriate usage, "in Sunday." Other prepositions she used were: "you find it for me," "for her" and "I tell Miss B. about that." Kathy omitted needed prepositions in the phrases "I didn't go dentist," and "write the book."

The great variability with which rules were applied is well illustrated by Randi. She used "in" and "on" 12 times. Some of the phrases are rather complex and complete, "in line in the movies," "I took it myself in the closet," "in the school building." Randi even differentiates between wearing glasses and having glasses, "got glasses on" and "I no have glasses." Yet, she leaves out the required prepositions in the phrases, "my bed cottage" and "I no sleep floor." She says "in trouble" and "get trouble" speaking both times of what would happen if she slept on the floor or threw orange peels on the floor, but she never says "get in trouble." Randi has apparently learned that the particle

can be separated from the verb in such phrases as "take her out" and "I put clothes away" but that the particle is inseparable from the verb in a phrase such as "look at the clock." It is difficult to determine whether the correct use of these phrases is the result of learning "rules" or whether these phrases are routinized chunks or "giant words." For example, Randi repeated a phrase popularized by TV with great gusto eight times, chanting and laughing "sock it to you," yet in speaking about something that had been given to her by the cottage mother she said "give to me sock" using the wrong word order. At another point, she repeated several times--knowing she was being naughty and enjoying it--"kiss her on the lips tonight" but elsewhere responding to a question about where she slept, she said "not floor."

Like some of the other subjects Janice used "in" and "on" to express other than the locative meanings found in early childhood language development, for example: "my lady's on vacation," "he's coming on Sunday," "Miss A's on today," "he gave me on my account," "she not coming in." The prepositions were missing in two sentences where they clearly belonged: "I went a bus trip yesterday" and "he might come a picnic." Janice also used a variety of other prepositions: "I go to church Sunday," "the last day of bible class," "I was dream about this," "for diet," "I sitting down by the bridge," "and she made me stay till four o'clock," "I was with her," and "with a washrag." There are a few oddities in Janice's use of some of the prepositions. She

repeatedly says "I sleeping by the bed," when she clearly means "on the bed" or "in the bed," "oops he come out my finger again" when the yarn slipped off her finger; "she's Protestant with me" referring to a church volunteer worker. At both sessions Janice talked about dreaming and two of her statements, in addition to making unusual use of the prepositions, also give some insight into her concept of dreaming: "I dream and sleeping out my eye," "I dream right through my eye."

In general, though there were some omissions, all the subjects used the prepositions "in" and "on" and all used at least some other prepositions in addition.

C. Articles

Brown discusses the definite article "the" and the indefinite article "a" at great length and concluded that of the 14 morphemes developing in Stage II "the definite and nondefinite articles seem to involve the greatest semantic complexity." The reason for this semantic complexity is that the proper choice of the definite or indefinite article at any time is based on a subtle and complicated relationship between the speaker and the listener and the referent. The definite article is permissible only if the referent is specific for both the listener and the speaker. If there is any ambiguity on either the part of the speaker or the listener, or both, or if the referent has not been previously specified or made salient, the nondefinite article "a" must be used (Brown, 1973, pp. 340-356).

Interpretation of usage in this area by the subjects of this study is particularly difficult. The indefinite article is rendered phonetically either by ʌ or ə , usually the latter, the unstressed schwa. However, this weakly stressed intermediate vowel can also be interpreted as "I" before a verb (Bloom, 1970). Because of the subjects' extremely deviant articulation the schwa was often interpreted as having other meanings as well.

Mary is credited with 35 articles in Table 17. All of these, without exception, were either ə or ʌ followed most often by another single word. Among the meanings ascribed to this utterance by the teacher and cottage attendant were: a, in, her, and I. Only those instances interpreted as being "a" are credited in Table 17 as being articles, of course. Most of the words which followed the schwa were nominals. These were offered not in answer to questions asking for names, but in answer to questions or comments asking what she was doing. For example, Mary was playing with a doll, holding it, kissing it, trying to undress it, etc. She was asked "What are you doing?" and answered " ə doll." Or, Mary had been hitting the doll's head and was asked "What are you gonna do with her head?" and answered " ə water." After she had finished washing the doll and was given a towel, Mary was asked "What are we doing to do with the towel?" and answered " ə wipe." On the other hand, there were instances when Mary's meaning could be inferred more accurately as for example when three consecutive utterances were: "I finish," "all done," "I finish." If there was any doubt, the schwa was assumed to be the indefinite article. It

is more than likely that some of these schwa utterances did not have that meaning. It is quite possible that some of them may have been only "starters" or an audible hesitation while she sought for a word. It was impossible to be certain and yet the temptation was strong not to throw out all of these two-word utterances. In any case, it is certainly very clear that Mary knew nothing about the rules for the definite and indefinite article.

The only two instances of use of the indefinite article by Lisa were in echoic phrases. She never used the definite article. She did, however, use the schwa when its meaning was clearly <u>not</u> the indefinite article, as for example in the sentence "What ə j ə doing?"

Susie echoed the indefinite article in phrases five times and the definite article three times. The other instances of use were in spontaneous phrases. She used the indefinite article incorrectly in the phrases "a Minnie Mouse" and "a mommy," not realizing that the former was a proper noun and using the latter as a common noun, a synonym for adult female. This is a very common practice. Elsewhere when she used the articles, she used them correctly.

Kathy used the wrong allomorph of the indefinite article in the phrase "got a S." She also used the indefinite article which in standard English has a + singular feaure with a plural noun, "a glasses." This is one of the pieces of evidence which will be cited in the section on plurals to advance the proposition that the singular/plural dichotomy is not well established, even where correct plurals appear. Kathy omitted the indefinite or

definite article in several phrases where it would be required, for example: "I want Sad Clown," "give me life saver," "write in book," "in hospital." Aside from the instances noted above, Kathy's choice of the definite or indefinite article appeared correct. She used both, sometimes in a learned phrase like "wait a minute" and sometimes in an original construction like "not the whole week."

Randi used both the definite and indefinite article; in all the utterances where either occurred the choice was correct. Randi, moreover, correctly omitted the article when she said "I put clothes away." However, she also omitted the article (and in some cases the preposition) where it properly belonged in such phrases as "she ha baby boy," "I get watch," "I get orange Speech," and "I say I live Training School." She knew the indefinite pronoun "one" and used it to signal someone whose name she had forgotten, "the other one."

Most of the time when Janice used an article she chose the correct one: "I like the assignment," "I don't work in the cement room," "She gave me a piece of gum to save for Friday," "She gave me a new one." A number of times she also correctly deleted the article: "I went to gym one day," "I go to church." There were a few instances when Janice chose the wrong article, in all cases the definite article when the indefinite article was required: "I saw the rabbit," "he gave me the present for Christmas," "she say buy the ice cream soda." None of these referents had been introduced into the conversation previously and the listener had no specific reference. In one case she used the wrong allomorph of

the indefinite article: "this a orange." There were a number of instances where Janice omitted the article when it was obligatory and some of these may be compared with the examples of correct usage given above: "I work in something else/not cement room," "I get present," "Doris gave me chewing gum," "this is last day" (although just after this she said "the last day of Bible class"). Sometimes Janice inserted an article when it was not required: "it make the peanut butter" and "I don't know how to wash the clothes" (in which the reference was not to any particular clothes, but to clothes in general). It is interesting to note that she also used the plural indefinite article "some," for example, "some girls," "I lose some weight," "give me some food," and the singular indefinite pronoun "one" as in "one with short hair."

It would seem that Kathy, Randi and Janice had mastered some, if not all, of the rules which govern the use of the definite and indefinte article.

D. Past Irregular

A very frequently heard, stereotyped phrase is "I got it" which Mary used both in the sense of completed action (after having put away the broom, as requested) and in the sense of having something, in this case the doll which she was holding. The other irregular verb she used twice was "did," in both cases referring to completed actions.

Lisa, too, used "did" twice in responding to the question "Who did it?" Lisa also reported that "he hit her," and although the action was in the past, the verb form, of course, does not

change so that crediting her with the use of a past tense here is very questionable. (To which may be added the confusion--irrelevant in this context, but nevertheless interesting to note, in passing--that what she evidently wanted to say was "she hit me!"). In two contexts which clearly referred to past events, Lisa used the present tense of the verbs "have" and "give."

Fourteen of Susie's 18 irregular past tense tokens were represented by the verb "got." In one case the tense was clearly differentiated in two successive utterances: "I get it" as she went after the ball, and "I got it" when she had found it. Three other instances were immediate or delayed echoic responses, "he ran away," "he ate he all up," "she ran home." In one case, in re-telling the story, the attendant said: "he ran out of the house" and Susie echoed "run house." Susie used present tense when the past tense was called for in "me fall down."

Kathy clearly demonstrated that she knew that "got" referred to a past event in two successive utterances: (he) "give me life saver" and "you got life saver already." However, in contrast to the three previous subjects, this was Kathy's only use of the verb "got." She used "did" and "didn't" much more often, sometimes to give "do" support to the main verb, as in "I didn't go," and very frequently in elliptical form. Most of the time when Kathy used the elliptical form it was correctly applied, i.e.:

EH - "You mean you brought her a present?"

Kathy - "Yes, I did."

Cottage Attendant - "You must have done something to her."

Kathy - "No, I didn't."

In only one case was the ellipsis incorrectly used:

EH - "Tell me how you got that knock on your head the other day."

Kathy - "Dina did."

As noted previously (p. 77), Kathy sometimes used the present form of the verb where the past was clearly indicated by non-linguistic circumstances.

EH - "What makes you like this book?"

Kathy - "My teacher give me that."

Other verbs used in the present instead of the past were: "tell" and "bring." Sometimes the two forms of the verb were in free variation as when, in referring to the same episode, two utterances were: "Madeline say that" and "Madeline said that." With two such phonetically similar forms, it must be said that some allowance must be made for incorrect interpretation despite repeated listening and group consensus since Kathy's articulation is extremely distorted. On the same grounds, Kathy's apparent use of the past tense in "I knew that" is here recorded with some misgiving.

Randi used "got" in the sense of having received something and in the sense of having something. It is sometimes very difficult to determine which is meant. Two instances where the "got" apparently was meant as past tense were credited. Randi knew that "broke" referred to something in the past as she said, "her

broke em/before. Her broke glasses." But in a subsequent utterance she showed that either she didn't know the present tense form, or she didn't know that the present tense form belonged in that slot when she said: "she don't do no more/broke glasses."

An unusual feature of Randi's conversation was the use of a rhetorical question which she immediately answered, thus, "Yeah, I say that." "who said it?/Kennedy." These three utterances were consecutive. Her teacher was telling of Randi's ability to name objects which start with different letters of the alphabet. (This is a daily classroom activity.) Randi had been able to tell what started with a "Z." "Yeah, I say that." Then she "spilled the beans" by revealing who had told her the answer, i.e. a teaching assistant named Kennedy. "Who said it?/Kennedy." Though both events were in the past, Randi used two forms of verb here. Another like sequence, this time in reference to glasses was :

"I get new one/next year."

"Who said?/the doctor."

Other single instances of the past tense usage was in the phrase, "gave me orange" and the sentence "I took it myself in the closet."

Janice used more past tense irregular verbs than any of the other subjects, and she was the only one to use past tense to express not only "earlierness" but the hypothetical sense of the unactual" (Brown, 1973).

Janice used "gave" correctly in seven phrases or sentences, for example: "He gave me the present for Christmas and "She gave it to me." She used "went" correctly four times in sentences such

as: "he went to the commissary with us," "first time I went home was for Christmas," and "I went a bus trip." In addition, she used the following verbs: "saw," "seen," "had" ("We had lunch down there"), "did," "made," ("She made me stay till four o'clock") and "might." Talking of her father (whom she has not seen since the age of one when she was institutionalized) she almost invoked, by repetition, the hypothetical possibility that "he might come," "he might come picnic."

A very interesting aspect of Janice's linguistic system was her use of "was." She used "was" correctly as a past tense main verb (copula) six times; "she was here this Sunday," "I was with her," "he was here one time." As previously discussed (p. 91), Janice also used "was" as an auxiliary to form some correct past progressive forms. Her "rule", however, allowed her to combine "was" with the base form of verbs to construct a past tense for either regular or irregular verbs, i.e.: "I was dream about this," "I was keep in line," "I was weigh twenty pound more," "I was work hard too."

There were a few instances when Janice used a present form where the situation required a past, i.e. when the yarn came off her finger, she said "oops, he come out my finger again;" talking about her weight, she said, "I lose twenty pound once," and telling about a fancied visit some previous Christmas, "my father take me."

E. Past Regular

It may be said that the regular past never becomes functional for the subjects of this study. There were only three

instances of the use of the regular past and they may well be accidental. Lisa said of another child: "he swallowed my bubble gum" and Janice repeated the phrase "it tasted bitter" twice. This stands in marked contrast to the active development and repeated use of a limited number of irregular past verbs.

Brown (1973) notes that the regular past tense developed among his subjects ninth in order of acquisition of the fouteen morphemes as compared to the irregular past tense which was the fifth morpheme to reach criterion, i.e. present 90% of the time in required contexts in three successive samples.

The regular verbs which were used were all used in the present tense, although there were occasions when the situation called for the use of the past tense. Both Mary, the youngest subject and Janice, the oldest, said "I finish" when the past tense should have been used. Other verbs used with the wrong tense were "walk," "want," "change," and "watch."

This almost complete omission of the inflectional marking of the regular past tense is one of the hallmarks of the speech of these subjects. This same tendency to ignore inflectional endings will show up in other morphemes as well.

F. Auxiliary - Uncontractible

Brown included in his count only the present tense allomorphs of the auxiliary "be." None of these appeared in the text of any of the children.

Janice did use the past tense allomorph "was" of the uncontractible auxiliary "be" eight times in such sentences as "I

was crying Sunday," "I was falling asleep and was dream about this," "I was keep in line."

There were also a few rare instances of the use of uncontractible modal auxiliaries such as Janice's repetitions of the phrase "he might come," and her question "how can I make it?" Randi also used auxiliary "do" in support of the main verb in her question "what do you want?" but Kathy omitted it in "how you know?" Susie also omitted modal auxiliary "can" where it was required in the phrase "she sit down."

G. Auxiliary - Contractible

Among the 50 contractible auxiliaries used by the six subjects, 38 were either "don't" or "didn't" (see section on Negatives, p. 74). Lisa and Kathy each used the modal auxiliary "I'll" once and Lisa used "I'm" once. Lisa said "what ə ya doin'?" and the schwa was credited as intended to be "what're"--second person singular contraction. Susie, Kathy, and Janice used modal "can't" a total of four times. Susie used the uncontracted form of the contractible auxiliary in her sentence, "she is making cake." Six of the remaining auxiliaries were contractions of third person present tense "be": "who's going" (Kathy); and Janice's "he's coming," "my father's gonna gimme," "he's gonna come," "she's coming" and "it's making me nervous." There was one contractible auxiliary "have" from Janice, "Carol's got long hair."

As noted above, Brown's discussion of the auxiliaries centers solely on "be." The allomorphs of "be," both in their contractible and uncontractible form are obviously marginal in the

production of the subjects in this study. The auxiliary "be" is redundant in simple declarative affirmative sentences in the present tense and provides no additional semantic input. "Clinical language cases," Lee (1974) notes, "seem unusually slow to make this adaptation to syntactic requirements."

H. Plurals

A considerable proportion of the plural forms which are used by the subjects are words which are commonly used only in their plural form, such as clothes, pants, teeth, glasses. In the absence of a contrasting form, or another marker such as a plural article or plural verb, the possibility exists that these words are learned as separate wholes, not as plurals. On the other hand, it is possible that a child may know both glass and glasses, for example, but not know the rule for agreement between article and noun or noun and verb. The data suggest that with the possible exception of the two oldest girls, the subjects were not using morphological markers to change singular nouns to plurals. Plurals occurred with very low frequencies except for the two oldest subjects.

Mary used plural words only three times. The words were "pants" and "feet." One of the three occurences was in the phrase "a pants."

Lisa used "clothes" twice and once " ➡ toes" which was interpreted as "her toes." Lisa spoke a great deal about her deck of "card" using the singular incorrectly on all thirteen occasions.

She also used "dog" and "hand" in the singular when they should have been in the plural.

Susie used "feet," "shoes" and "pants" for a total of six plural expressions; however, at least twice, "feet" should have been "foot."

Kathy omitted the plural marker on "four day," "five day" and more than half a dozen other words on which it would have been required. She also used the singular pronoun "it" to refer to "glasses" before which, as noted previously above, she had used the singular indefinite article.

Randi used plurals most frequently, with the widest variety of words and never omitted it where required. Thus, Randi spoke of "cards," "jacks," "peas," "lips," "earrings," "eyelashes," "lipsticks," "hamburgers" and "hotdogs" in addition to the usual "clothes," "socks," "feet" and "glasses."

Janice marked some of her plural nouns with the plural article "some" (see page 99 above), but she also used the singular indefinite article with a plural noun, i.e. "not a dryer girls." (Janice meant that she is not one of the girls assigned to dry clothes.) Elsewhere she said "I not diet girls." It is possible that she regards "dryer girls" and "diet girls" as "giant words" and has not segmented them properly into their components. On the other hand, it is also true that she used the singular article and plural noun in "on a stoves" where such confusion could not have occurred. She used the plural affix on "times," "weeds," "hands," "pounds," "girls," as well as "clothes" and "teeth." It was missing where it belonged on four occasions.

I. Possessive Inflection

Brown (1973) and Bloom et al. (1975), among others, have discussed the relationship between cognitive awareness and semantic-syntactic realization. Bloom says: "Knowing about something does not simply translate to being able to talk about it....," and Brown proposes that "in the degree that we develop evidence of semantic intentions that is other than the evidence of normal adequate linguistic expression it will become possible to separate semantic development, which is no doubt related closely to general intellectual development, from development of expressive mechanisms."

These remarks are particularly pertinent to the discussion of the possessive inflection which had the lowest frequency of occurrence of any of the fourteen morphemes. Five of the subjects never used possessive inflection and Lisa repeated "mama's house," thus bringing the count to two. However, "mama's house" alternated with "mama house" and "grandma house" so it may be a variant or a performance slip in the right direction rather than evidence of competence. This is particularly interesting because every subject used other linguistic means to signal possession. Even the youngest subject used the possessive adjectives "my" and "her." Lisa also used "have," a verb which Brown says rarely appeared at Stage I, and indeed was infrequently used by our subjets. In addition to using the possessive adjectives "my," "your" and "her," Kathy inquired about possession by someone else by asking, "Whose is this? You?"

The most revealing evidence of cognitive and semantic mastery of the concept of possession with a corresponding lack of ability to use the linguistic device of nominal inflection was demonstrated by Randi and Janice.

Randi signaled possession by means of the possessive adjectives, the verbs "have" and "got," the immature N+N construction ("my sister house") and even the possessive pronoun "yours," i.e. "I like yours, too." However, Randi struggled through the following series of consecutive sentences trying to convey her meaning:

"Jill Wallace ha Beatrice her friend.

"Beatrice Jill Wallace friend.

"Jill Wallace

"is her friend."

She could not manage "Jill Wallace is Beatrice's friend."

Janice also used the possessive adjectives, and the verbs "have" and "got," but instead of "Lucy's husband is Peter Caca" she laborously produced "Peter Caca is husband of Lucy." Interestingly, Janice could use the N+/z/ construction in case of copula contraction, e.g. "Carol's got long hair," "my lady's on vacation" and "my mother's here to visit," but there are no instances in the sample of the use of this construction to express possession.

Although the opportunity existed for many expressions of possession and they were expressed, it was not done by inflecting the possessor noun. There are relatively few inflections of any kind used by these subjects, and it may be that the problem of locating the inflection on the possessor word becomes too confusing,

and therefore is omitted. It is also possible that there are fewer occasions when it is necessary for these subjects to use this device. If discourse is largely confined to events concerning those directly present, it is easier and just as efficient to say "my," "your," and "her." The possessive inflection becomes obligatory only in reference to something or someone not directly present.

Comparison with the children in Brown's study reveals that Sarah reached criterion on the possessive inflection (inclusion in obligatory texts 90% of the time) in late Stage II, Eve in late Stage III and Adam in Stage IV. The four children in Bloom et al.'s study (1975) who, at their last recorded taping were at approximately late Stage II or early Stage III, in terms of MLU, also used the possessive inflection very rarely. It is likely, therefore, that the retarded subjects simply did not develop beyond this level of skill in using possessive inflections. On the other hand the normal children, at these early stages, did not have the variety of alternate means of expressing possession which the older retarded subjects developed.

J. Copula-Uncontractible

Of the three youngest children only Lisa used the uncontractible copula, once: "is supper." Kathy used the copula frequently, almost always with the "is" allomorph. Two exceptions to this rule were: (1) a rote-learned phrase; "you are so" and (2) "Ya be here Tuesday" where the modal "'ll" was missing. Kathy used "is" in elliptical phrases such as "yeah, it is" and "yeah,

I am." (The former was inappropriately used.) She used it, too, in questions: "Where is it?" "is that your name?" "whose is this?" "what is it?" Most interestingly, she used it in a sentence frame which was very serviceable and could be adapted to many purposes. "I know what this is," "you know what that is?" "you know what a holder is?" "you know Camp Aldersgate is?" "you know Camp Meyers is?" She omitted the copula in two obligatory sequences, both of which required something other than "is", i.e. "he mad at me" (past reference) and "you here tomorrow?"

Randi seldom used the uncontracted copula. There were only two tokens, both repeated: "Jill Wallace is her friend" and "Yes she is."

Janice used the allomorph "is" far more frequently than any other; occasionally she used "am" (Yes I am") and "was" ("he was here," "she was here"). The copula was missing in four contexts where it would have been required.

K. Copula-Contractible

Lisa used "what's," "it's" and "that's" and "I'm not tire." She omitted the copula in her frequent repetitions of "I on diet," "he on diet." Susie used only "that's" and did not always supply it where required.

Kathy never used the contractible copula. Of the five obligatory contexts from which she omitted the copula, only one would have required the "'s" - "it pretty."

Randi said "that's right" five times and "she's crazy" once. She omitted the copula in "I glad."

With one exception all of Janice's contracted copulas were "'s." The exception was, "I'm twenty pounds." Janice not only contracted the copula on words which may have been learned as wholes such as "it's," and "that's," but on nouns and pronouns, i.e. "my lady's on vacation," "my mother's here to visit," Miss A's on today," "she's Protestant with us" and "my hand's caught."

The allomorph "is" of the copula, either in its uncontractible or contractible form is a functionallinguistic device for the majority of these subjects to a limited extent. All other allomorphs of the copula are strictly marginal in development even for the older subjects.

L. 3rd Person Singular Present - Irregular

The only English verbs which fall into this category are "does," "has" and their negative forms "doesn't" and "hasn't." None of the subjects ever used "does" or "doesn't." Lisa and Randi each used "has," but not always where required. Janice had only one sentence where a third person singular irregular verb would have been required. Talking about Elvis Presley she said: "he do something n the lady."

M. 3rd Person Singular Present - Regular

Only Janice supplied "starts," "loves," and "works." She omitted the inflection on "makes" and "cuts;" so did the other subjects on "gets," "knows," "gives," "goes" and "plays."

Next to the possessive inflection and the past regular, the 3rd person singular present, regular and irregular, had the

lowest frequency of occurrence among the 14 morphemes. It is noteworthy that Brown's three normal children reached criterion on these only at Stage IV or V.

To sum up the performance of the 14 morphemes, it should be said that the absolute frequencies are somewhat misleading since they often represent repetitions of the same phrase. What is important is the relative frequencies of the different morphemes and especially the absence or near absence of some of them across all the subjects. As a group, one could say that they had adequate but not complete control of:

Present Progressive
Prepositions - in and on
Articles (without clear differentiation between definite and indefinite)
Past Irregular (of a restricted number of verbs)
Auxiliaries - Contractible (marginal use of the allomorphs of "be")

Again as group, they used the following to a limited extent:

Auxiliary - Uncontractible
Plurals
Copula - Uncontractible
Copula - Contractible

As a group, they made little or no use of:

Past Regular
Possessive
3rd Person Singular - Irregular
3rd Person Singular - Regular

Although there is considerable difference between the linguistic abilities of the individuals within the group, especially between the youngest and the oldest, the results of this analysis lend support to Hypothesis B, which stated that early institutionalized D. S. individuals learn some of the modulations characteristic of Stage II, but some modulations are never incorporated into their spontaneous language.

Constructions Used by the Retarded Subjects but not by Brown's Normal Children at Stages I and II.

Table 18 displays the number of four, five and six-term constructions. Table 19 gives the relative frequency of occurrence of two, three, four, five and six-term relationships.

Table 18. Number of four, five and six-term constructions.

TYPE OF CONSTRUCTIONS	MARY	LISA	SUSIE	KATHY	RANDI	JANICE
Four-term	0	0	0	16	9	50
Five-term	0	1	0	4	5	10
Six-term	0	0	0	0	0	4

Table 19. Frequency of occurrence of two, three, four, five and six-term relationships in proportion to the number of analyzable utterances.

TYPE OF CONSTRUCTION	MARY	LISA	SUSIE	KATHY	RANDI	JANICE
Two-term	.84	.63	.81	.54	.61	.35
Three-term	.12	.34	.17	.32	.31	.41
Four-term	0	.02	0	.09	.04	.17
Five-term	0	.005	0	.02	.02	.03
Six-term	0	0	0	0	0	.01

The subjects of this study used some constructions which did not appear at all, at these Stages, in the speech of the normally developing young children.

A. Embedded and Coordinated Sentences

The sample produced a number of different types of coordinate and complex sentences including sentences using conjunctions, relative clauses (wh pronouns), infinitival complements and non-complementing infinitives.

As might be expected, Janice produced the greatest number and diversity of sentence types. However, the most interesting linguistic edifice, founded on a single rock, as it were, was raised by Kathy. Limber (1973) defined a complex sentence as one containing more than one verb. All of Kathy's complex sentences used "know" as the matrix verb. She showed great versatility in manipulating this verb:

"You know what is it."
"I know where is it now."
"I know who's going."
"You know they running around over there."
"You know what that is."
"Know what I like?"
"I don't know why."
"I know who."

There were only two complex sentences which she produced without "know." These were: "Wanna see me do this?" and "I like to do this."

None of the other subjects showed a similar partiality for one verb nor did any of them produce as great a variety of wh-pronoun clauses. Janice extended Kathy's list by saying, "I don't know how to wash the clothes" and "I don't know how to do it." However, Janice's most productive complex sentence-type was the infinitive. Some of her sentences were:

"My mother's here to visit."
"She no come see me."
"I gotta go to the kitchen again."
"I no get money to brush my teeth."
"Yeah, we have to eat tonight for supper."
"She gave me a piece of gum to save for Friday."

Even Lisa used a complex sentence with an infinitive and deleted marker: "I got Willie A. play my card." And so did Randi: "I want keep it," and "we want Debbie to get fat."

The following are additional examples of complex sentences:

"I say I live Training School." (Randi)
"I say I like movies." (Randi)
"I dream and I close my eye." (Janice)
"And she made me stay till four o'clock." (Janice)
"Because I no got no money buy a toothbrush." (Janice)

B. Temporal Constituent

Brown mentions temporal references only in passing and cites them as a possible addition to Fillmore's list of basic case concepts.

Each of our subjects had one or more references to time and these were counted as separate constituents. Mary, having put the doll's pants on said "now better." Lisa, not wanting to put her coveralls back on, begged "later," "later," "when my mommy come." Kathy asked, "where is it now?" and told the cottage attendant "you be here Sunday" (meant as future reference, not an imperative) and "you not here Monday." From the daily calendar in the schoolroom she "read": "today is Tuesday." And to her teacher she said "you got life saver already." Randi repeated "I kiss her tonight," "kiss her on the lips tonight" and said "I get new one/next year." Janice had considerable variety in the terms she used:

"I see my friend today." (completed action)
"Miss C be back soon." (future)
"He come out my finger again." (completed action)
"I went a bus trip yesterday."
"First time I went home was for Christmas."
"I lose 20 pound once."
"He was here one time."
"I went to Gym one day."
"I go to church Sunday." (generality)

Although the names of the days were used, there was evidence that the sequence of days was really not well understood and that "yesterday" did not actually necessarily refer to the day before today. Janice used, but apparently did not understand the meaning of "yet." For example, after saying that "Miss A.not coming in yet," she was asked when Miss A. was due in and replied "she not coming in."

Reference is made to past, and sometimes to anticipated events. Such references are clarified by the use of time adverbials or the mention of specific days, seasons, holidays, etc. since syntactic devices to indicate time are extremely limited. As we have seen, the subjects use a restricted number of irregular past tense verbs and practically no regular past tenses. Future happenings may be indicated by the use of the catenatives "gonna" or "wanna" or--very rarely--"'ll"--and even more rarely, "be" plus a locative or time adverbial such as Janice used, "Miss C be back soon." Although there are limited expressive devices available for specifying past and future, all but the youngest subjects demonstrated comprehension of these concepts by correctly replying to questions probing the issue.

The routine of life at the institution is governed by time: time for meals, time to go to sleep, time to get up, time to go to

school, time for a change of shifts, time for the movies, etc. It is a factor which the subjects are aware of although their concepts are hazy. None can tell time. Those who go to school may repeat the days of the week and the months of the year by rote. The past is generally clearer than the future, but once it is past there is no precision as to exactly when it occurred--yesterday, last week, last summer. Nevertheless, time is a factor to be reckoned with and talked about.

The retarded subjects used coordinated and complex sentences with embeddings as well as a time constituent which did not appear in the samples of normal young children developing their first language. This evidence therefore supports Hypothesis C, which held that early institutionalized D. S. subjects spontaneously use some semantic relationships and grammatical structures not commonly characteristic of Stage I and Stage II.

Word Order

Before leaving the language samples, a word must be said about the near absence of errors in word order. In all there were only six occurrences of incorrect word order. These were:

Lisa:	"come man"
Kathy:	"I know where is it now" "You know what is it"
Randi:	"tell you" for "you tell" "Holler B" for "B (will) holler"
Janice:	"my foster father he is" for "he is my foster father"

We may, therefore, say that without question this first aspect of linguistic competence was fully mastered.

MILLER-YODER TEST OF COMPREHENSION

The Miller-Yoder Test was designed specifically for use with retardates. It was included in the design of this study in order to provide some independent assessment of the subjects' comprehension of certain grammatical structures in addition to the evidence provided by the language samples.

The Miller-Yoder Test was administered twice; results are displayed in Table 20. The second administration was decided upon because the results of the first test appeared to be too scattered and random to be reliable, and did not appear to reflect grammatical knowledge with had been demonstrated in the language samples. (The test was administered to Janice first in December 1975, but that test protocol was misplaced and recovered only much later. She was then tested twice along with the other subjects. For comparative purposes the results of all three of her tests are given in Table 20.) There was at least a month, but usually six weeks between the first and second administration of the test. The experimenter administered the first test and another speech pathologist, also familiar with the subjects, administered the second test. In order to be given credit for any item, the subject had to get both members of a sentence pair correct. Thus a credit of one (1) means that a pair of sentences was correctly identified and a credit of two (2) that two pairs were correctly identified.

Table 20. Responses to Miller-Yoder Test of Comprehension.

CONSTRUCTIONS TESTED	MARY	LISA	SUSIE	KATHY	RANDI	JANICE
ACTIVE						
Subject-Object (2)		1	1		1	(1)
PREPOSITION						
on/under (2)	2	2	1	1 2	1 2	1
in/beside (2)		2		1 2	1 2	
POSSESSIVES (2)					1	(1)
NEGATIVE/AFFIRMATIVE STATEMENTS						
has/doesn't have (2)			1	1 2	1 2	
can/can't (2)				1 2	1 2	
Is/is not (2)		1	1	1	2	1 1 (1)
PRONOUNS						
Object: her/them (1)		1			1	
him/her (1)					1	
him/them (1)						(1)
Subject: he/they (1)						(1)
she/they (1)						
he/she (1)			1			
Subject/Object (3)			1			

Numbers represent pairs of test items and the number of pairs each subject chose correctly.

Numbers without underlining represent test results on the first administration of the test.

Numbers with underlining represent test results on the second administration of the test.

Numbers in parenthesis represent the third administration of the test to Janice, alone.

Table 20.--continued

CONSTRUCTIONS TESTED		MARY	LISA	SUSIE	KATHY	RANDI	JANICE
SINGULAR/PLURAL							
Noun	(2)	1			1		
Noun/verb inflec.	(2)				1		
Verb is/are	(2)					1 1	(1)
VERB INFLECTIONS							
Present Prog/Fut.	(1)						
Present Prog/Past	(1)						
Future/Past	(1)	1				1	
MODIFICATION							
Object	(2)	1	1	1	1 2	2 2	1 2 (2)
Subject	(2)	1	1 1		1 2	2	2 2 (2)
Subject/Object	(2)	1			1	1 1	1 (1)
PASSIVES							
Reversible	(2)		2			1	(1)
REFLEXIVIZATION	(2)					1	

Numbers represent pairs of test items and the number of pairs each subject chose correctly.

Numbers without underlining represent test results on the first administration of the test.

Numbers with underlining represent test results on the second administration of the test.

Numbers in parenthesis represent the third administration of the test to Janice, alone.

Next to the listing of each grammatical construction on the left, the number in parenthesis gives the number of sentence pairs which examine that particular construction. For example, under Negative/Affirmative Statements there are two sentence pairs (2) which test the contrast has/doesn't have.

Examination of the table shows that the largest number of correct answers cluster around three constructions: Modification, Negative/Affirmative Statements and Prepositions.

The line drawings which need to be identified to earn credit for:

Modification/Object are: John has a little truck; John has a big truck.
Sally has a red ball; Sally has a green ball.

Modification/Subject are: The little dog is sleeping; The big dog is sleeping.
The blue bird is flying; The black bird is flying.

These pairs are illustrated by exactly the same drawing except for the adjective and noun being tested. John had a little truck or a big truck. Sally had a red ball or a green ball, etc. The foil pictures for the former were a little ball and a big ball and for the latter a red pail and a green pail. Therefore, the question becomes primarily one of vocabulary rather than comprehension of a grammatical construction.

On the Negative/Affirmative Statements two of our subjects, Kathy and Randi, did well. It is surprising that Janice scored lower than Kathy or Randi. In the language sample she certainly demonstrated understanding of has/doesn't have and can/can't.

Examination of the test protocols shows that on two of her tests on these items she pointed to the picture of John wearing a hat, apparently "catching" the key words, "John" and "hat," but ignoring the affirmative/negative linguistic cues. All the subjects demonstrated this type of behavior, often ignoring the key linguistic cues and responding to some other salient aspect of the situation; the last word, the head noun, some feature of the drawing, etc. It will be remembered that Semmel and Dolley (1971) had very similar results and commented that their DS subjects "may have the competence to deal with negative sentences but may fail to attend to the negative marker in the surface structure and thus treat the sentence as if it were an affirmative string."

The sentence pairs for can/can't were:

> John can catch the ball; John can't catch the ball;
> John can carry the box; John can't carry the box.

It is possible that the line drawings on these contributed to the difficulty. In the picture where John could not catch the ball, it was shown just sailing over his head, which seems reasonable enough and none of the foil pictures would have fit the description; nevertheless, it is possible that the subjects could not comprehend the import of the situation. The box John could not carry was so large that it was totally out of proportion. It overshadowed John and may have lost its "box-like" character. Susie and Janice pointed for both sentence pairs to the "can't" picture and Mary and Lisa pointed for both to the "can" picture. "Is" and "is not" were presented as verbal auxiliaries. There is no consistency in the

pattern of responses from these subjects. Randi got both these sentence pairs right on the second test and both wrong on the first test, which leads one to suspect guessing or attention to some irrelevant factor. On one test Janice got one of the pair right and on the other test the other of the pair--which again leads one to suspect guessing or inattention. Kathy and Susie located "is/is not working" correctly one time and Lisa correctly identified the other pair "is/is not running" one time.

Miller and Yoder (1973) reported on a study carried out by L. Rider at the University of Wisconsin in 1973. Rider reviewed the results of the Miller and Yoder study with retarded subjects and wondered why subjects were able to respond correctly to one sentence pair of a particular construction but not to the other. The assumption underlying the construction of the M-Y Test had been that comprehension was based on knowledge of grammatical form. But if this were so, then once this knowledge had been acquired, once the governing rule had been grasped it should be applicable to all appearances of the construction. Obviously, it was not. Brown (p. 257) takes pains to point out that this assumption was not borne out by his data either. Rider then proceeded to investigate the semantic functions which a particular grammaticalconstruction may encode. A given grammatical form may encode different semantic meanings. For example, Bloom (1970) had shown that the semantic functions of non-existence, denial and rejection were all expressed through the same syntactic means. Rider, therefore, took the sentence pairs expressing affirmative/negative relations and analyzed

semantic content. He discarded can/can't which expressed neither non-existence, denial or rejection and decided that the statement "John doesn't have a hat" expressed non-existence and the statement "Sally doesn't have a dress" expressed denial; "the dog is not running" expressed denial and "the man is not working" expressed non-existence. On the basis of this analysis, he was able to show that the subjects of the Miller-Yoder study acquired the semantic notion of non-existence earlier than the semantic notion of denial, which agreed with Bloom's observations. However, one is left wondering on what basis the semantic of these sentences had been decided upon. In the picture showing "John doesn't have a hat," the boy is bareheaded. In the picture of Sally, she was wearing a pair of coveralls which may have led to a statement of denial concerning the dress, but need not necessarily have done so. The picture showed the dog lying down, i.e. "not running" and the man standing still, upright, i.e. "not working." The difference in the semantics of the situation is hard to grasp.

A breakdown of the results of our testing on these same sentences gives some support to Rider's conclusions, but may also be explained on different grounds such as those hypothesized above. (Table 21)

As a group, the DS subjects did well on the section on prepositions and confirmed the evidence of the language sample which amply demonstrated that they know and use prepositional concepts. Again, Janice did surprisingly poorly. Over the three administrations of the test, she had only one pair of prepositions

Table 21. Responses to negative sentences according to semantic function.

SENTENCES	RIDER'S CLASSIF.	MARY	LISA	SUSIE	KATHY	RANDI	JANICE
John doesn't have.	Non-exist.			X	X X	X X	
Sally doesn't have.	Denial				X	X	
The dog is not running.	Denial		X			X	X
The man is not working.	Non-exist.			X	X	X	X

correct. On all other sections, the responses were too scattered and unsystematic to be accepted with any confidence. The test, therefore, cannot be considered a reliable instrument for determining the comprehension of individuals in this group.

CHAPTER V

DISCUSSION

Sequence of Development - The Role of the Grammatical Morpheme

The results of this study confirm Lenneberg's conclusion that Down's Syndrome individuals learn language in a sequence essentially similar to that of normal children. However, it does not fully confirm his contention that language learning is arrested at a "primitive level." The implication of that statement would seem to be that learning proceeds normally across the full range of knowledge and skills which go into the acquisition of a natural language and then is halted at some point. A somewhat different pattern is evident here. When the subjects were viewed on a continuum of increasing chronological age, there was a pattern of slow but continued accretion of skills in certain aspects of linguistic knowledge with a simultaneous partial or complete lack of development in others.

Although the MLU for the group did not rise above 2.0, and the range of MLU was very narrow, from 1.6 to 3.0 (from 1.6 to 2.0 if one excludes the oldest subject), there was considerable diversity of linguistic ability among the members of the group. Although even the youngest subject used the eight basic semantic relationships, as the subjects got older there was an increase in the number of analyzable utterances and the number of multi-term expressions. Two and three-term relationships were used primarily, but with increasing age there were also four, five and six-term relationships (Table 19). In other

words, the ability to express increasingly complex semantic relationships sustained a slow but steady growth. At the same time, however, some of the grammatical morphemes did not develop at all. Other grammatical morphemes developed to some extent and were used with varying degrees of efficiency by the subjects. It is reminiscent of Cornwell and Birch's (1969) observation that there was a great deal of individual variation in development and also "not merely a delay in the development of certain functions, but also an arrest in function." Learning did not proceed normally throughout a broad range of skills but in an uneven and idiosyncratic pattern.

Dingman and Meyers (1966) wrote that "the lack of verbal ability in patients with Down's Syndrome has been noted, but the specific nature of the types of deficits in verbal ability has not been studied."

The evidence in the language samples supports the hypotheses on which this study was predicated:

Hypothesis A. The Down's Syndrome subjects by the time they reached adulthood had attained the linguistic skills typical of a normal Stage I child. They had, as a group, a mean length of utterance of 2.0; they used the eight basic semantic relationships and the modalities of negation, question and the imperative. In addition, they showed control of word order and the basic S-V-O grammatical structure of English.

Hypothesis B. The early institutionalized Down's Syndrome subjects by the time they reached adulthood had learned some of the

grammatical modulations which characterize Stage II linguistic development, but some modulations were never employed. At all levels the subjects showed deficiencies of various degrees in their ability to use the subtleties and modulations supplied by the morphemes. Brown explains that the grammatical morphemes have "their first sprouting" at Stage II and reach criterion much later. In terms of their MLU, five of our subjects were at Stage I; Janice, the oldest, was at Stage III.

There is variation among normal children in the acquisition of the morphemes. Of the three normal children in Brown's study--Adam, Sarah and Eve--only Sarah reached criterion, i.e. 90% correct usage in obligatory contexts, on the plural at Stage I. At Stage II, Adam reached criterion on the present progressive, in, on and the plural. At Stage II Sarah reached criterion on in, on, present progressive, past irregular and the possessive. Eve reached criterion on the present progressive, on and in at Stage II. At Stage III, Adam reached criterion on the uncontractible copula and the past irregular. At Stage III Sarah reached criterion on the uncontractible copula and the articles. Eve reached criterion on the plural, the possessive and the past regular at Stage III.

The Down's Syndrome subjects, by contrast, as a group acquired functional control of the present progressive, in, on, the articles (without clear differentiation between definite and indefinite), the past irregular of a restricted number of verbs and the contractible auxiliaries (primarily "don't" and "didn't," not the allomorphs of "be" which were the only ones Brown counted). To a

limited extent the DS group used the uncontractible auxiliaries, the plurals and the uncontractible and contractible copula. For the DS subjects the past regular, the possessive and the 3rd person singular irregular and regular morphemes were not operative parts of their grammatical structure.

From one point of view, one might say that this level of morpheme development is all that could be expected given the fact that five of the subjects were at Stage I. Johnston and Schery (1976) working with language deviant children of normal intelligence note that their subjects "reached the 90% acquisition criterion one or two levels later than normal children." It is possible that the DS subjects simply never attained a mean length of utterance at which further morpheme development might be expected. It is a theoretical possibility that if language development continued the DS subjects might eventually acquire control of additional morphemes. In addition to the present progressive, in, and on, the plural is among the early forms learned by Brown's normal children and even Johnston and Schery's (1976) deviant children attained 90% use in obligatory contexts at Level II (2.5 - 3 words). Only the two oldest DS subjects showed any real differentiation between singular and plural nouns. However, clinical experience demonstrates that early-institutionalized Down's Syndrome individuals do not develop beyond the level of our oldest subject.

The morphemes elaborate and supply specificity of place, time, manner and number by "modulating" the basic constituents. Some of the morphemes are "free forms," readily recognizable as separate

words having relatively high perceptual salience and phonetic substance. These are the prepositions, the articles, the past tense of irregular verbs, the uncontractible copula and the uncontractible auxiliary. The contractible copula and the contractible auxiliary readily combine with pro-forms ("it's," "that's") and models ("don't," "can't") to form common and frequently-used words learned as "wholes." Most of the remaining grammatical morphemes of Brown's list of fourteen are "bound" forms which have no meaning by themselves, but must be a part of another word, such as the "ing" of the present progressive, the "'s" of the possessive, the various forms of the plural, the 3rd person singular, and the regular past tense. Some of these morphemes are redundant, supply no semantic input and are required for purely formal grammatical purposes. Omission of such morphemes makes communication ungrammatical, but not necessarily unintelligible. One is reminded of a person struggling to communicate in an unfamiliar language. The tendency is to use major lexical items and to contruct primitive strings with the elementary semantic relationships needed for purposes of gaining or giving essential information. This description seems very similar to the Down's Syndrome subjects who used a few of the modulations, primarily (though not exclusively) the free forms, but were unable to master the intracacies of inflecting and declining the bound forms. The Down's subjects seem able to learn a base form or a whole which they perceive as a base form, e.g. "don't," "went," "going," etc., but do not learn to inflect a base form according to abstract linguistic rules, e.g. "does," "walked," "Mary's."

Hypothesis C. Early institutionalized Down's Syndrome subjects by the time they reach adulthood use structures and relationships not yet developed or rarely employed at Stage I and Stage II by the normal young child as described by Brown. The DS subjects used complex and coordinate sentences, adverbs of time and manner and a relatively large number of "stative" verbs which have an Experiencer or Person Affected Dative in the subject position.

Limber (1973) defines any sentence with more than one verb as being "complex." According to him, "many children at two produce complex sentences." Limber reported on three children who are part of a longitudinal study now in progress. The three children on whom the report is based constitute the group most advanced in language development with the others "being nowhere near this level of productive development." Limber provides a table with a "chronology of complex constructions" from one year eight months to three years one month. Limber states that the first complex sentences are usually constructed with two classes of verbs, "the wants: want, need and like; and the watches: watch, see and lookit." Using these verbs, children, according to Limber construct their first complex sentences using object complements at about age two. At about two years six months verbs such as "show" taking wh-clause objects appear. As an illustration of the type of construction which emerges at that time, Limber supplies the sentence, "I don't know who is it" which is of special interest because our DS subject Kathy (CA 14 years 8 months; MLU 2.0) had a very similar sentence. Coordinate sentences with conjunctions supplied are also said to begin to appear around two years six months.

Bloom, Lightbown and Hood (1975) also attest to the appearance of complex sentences in the language of children with an MLU up to 2.5. In their sample these sentences appeared to express "intention" using such verbs as "want," "going to," "have to" and "let's." Verbs of Notice also appeared in complex sentences in their data.

A glance at the examples of the complex sentences of our Down's Syndrome subjects on pages 115 - 117 will show that some of them are of the pattern described by Limber and Bloom et al. For example, Kathy's sentences would seem to fit these descriptions. However, some of Janice's sentences seem to show a more complex structure, for example, "I no get money to brush my teeth" and "she gave me a piece of gum to save for Friday."

Limber's chronology chart indicates that expressions of time begin to appear around 2 years 11 months. It is impossible to estimate at what Stage of language development Limber's children would be at in terms of Brown's stages. At two years 11 months Brown's Eve was far past Stage V, but Adam was just starting Stage III and Sarah was just starting Stage II. Brown does not discuss adverbs of time. All of the DS subjects of the present study used such adverbs rather frequently, especially the older ones (see p.116).

Brown did not include among his basic eight semantic relations the stative verbs which take a person-affected dative or experiencer in the subject position. He notes that such constructions "were fairly common" but not frequent enough to be included as one of the basic relationships.

In the study by Bloom, Lightbown and Hood (1975) a category called State emerged for their four normal subjects and so did another category called Notice. Verbs such as "see" and "hear" which Brown identifies as "state" verbs were assigned by Bloom et al. to this category. Among the verbs assigned to the category State were the copula followed by a predicate adjective and the various forms of the verb "to have." The DS subjects used all the verbs listed in the Bloom et al. study (1975) such as "want," "like," "see," "hear," "need," "have," "got," and the copula. In addition they used a number of other verbs. The most frequently used of the "state" verbs was "know." Everyone of the Down's subjects used this verb one or more times. Kathy, in particular, had many tokens involving this verb. Among the other verbs were: "hate," "wear," "care," ("I don't care"), "holler," "say," "love," "sleep," "dream," "weigh," "lose," ("I lose some weight"), "live," "miss," "keep," ("I was keep in line"), "think," "sweat," ("I starting sweating"). This is probably a reflection of the fact that the DS subjects, and especially the older ones, talk about different kinds of things than do normal children of 18 to 24 months, and, as we have seen, they use more complex structures than do such normal young children.

The Law of Cumulative Complexity

The "Law of Cumulative Complexity," as Brown formulates it, states that x and y symbolize component knowledge. The knowledge may be semantic or grammatical or both. Brown believes that the

"Law" applies to both. For a child to be able to construct a two-word relationship, he would first have to learn, separately, the lexical items "hit" and "ball." That would be necessary, but not sufficient knowledge to form the string "hit ball." Something else would have to be added, the ability to perceive the relationship action-object and the linguistic "know-how," the knowledge to put it together in the right order. Then x + y could be formed. Another x + y string could be formed by combining an agent and action. In turn these two strings would combine to form, with proper deletion, the agent-action-object relationship. No x + y combination could be formed until each of the components x and y had been mastered and then the additional knowledge (whether semantic or grammatical) acquired to form the new combination of x + y. The x + y relationship is greater than either x or y alone. x + y cannot be constructed unless all the parts constituting x are present and all the parts constituting y are present. And even when they are both present, an extra component is required, the additional knowledge which results in x + y.

If this explanation is generalizable to other aspects of syntactic development, it may be that the grammatical morphemes of Stage II are prerequisite for the ability to construct complex embedded sentences at Stage IV. The question is legitimate because it may be assumed that the earlier-developing knowledge will contribute to the realization of the later-appearing skill. And the question would then arise how a later level (i.e. embedding) construction could be used if the earlier, prerequisite level (i.e.

grammatical morpheme) was partially by-passed. The findings of this study imply that mastery of all the grammatical morphemes is not a necessary prerequisite to the ability to form complex sentences. Possibly grammatical morphemes, or at least some grammatical morphemes, are a refinement, a branch of the linguistic tree whose growth can be arrested without aborting the continued growth of the tree itself. Moreover, even for normal children, Bloom et al. (1974) list the appearance of coordinate and subordinate relations with another clause as occurring during the period when the maximum mean length of utterance was not greater than 2.5 (Stage II). Limber (1973) does not supply MLU, but says that "Many children at two produce complex sentences" such as verb object complements with wh clause constructions and conjunctions coming some months later.

Of course, it is possible that Brown's "Law" is not a law at all. Bloom et al (1975) found that some developments "could not be explained by cumulative syntactic complexity." However, there is a certain "common sense" reasonableness to the "Law." Perhaps it ought to be specified that advances in learning do not proceed at a uniform pace and that all aspects of "lower level" knowledge are not funnelled into the acquisition of all aspects of "higher level" knowledge. It is clear that at minimum what must be available to form these longer and more complex constructions is the ability to store, retrieve, program and organize sequences of six to ten words and the relationships they represent. Janice's longest sentence had eleven words (twelve morphemes). "She gave me a piece of gum to save for Friday," and included, of course, the correct irregular past tense verb.

Discourse Factors

A. Intelligibility

Communication with the subjects of this study must always be viewed as being sifted through the veil of their grossly deviant articulation which in effect changes fundamentally the nature of the "conversation game." The ball cannot bounce naturally back and forth between speaker and listener with both following the topic under discussion. The ball is constantly stalled as the listener tries to clarify the meaning and intent of the speaker. Brown notes that the young child learning to talk at home expects to be understood and usually is. His experiences are shared and known by the immediate family to a considerable extent and, therefore, a single word or an incomplete phrase will evoke similar memories and allow for immediate and correct interpretation. This is also partly true for the very young institutionalized child. However, caretakers change with shifts, personnel from different buildings see the child for only short periods of time and, therefore, cannot have the same pool of shared experiences and the same immediate understanding of fragmentary utterances. This becomes more and more pronounced as the child grows older and moves around the institution with occasional outside trips and outings. Experiences are no longer shared, but utterances continue to be fragmentary and one of the great obstacles to communication is unintelligibility. The incomplete and incorrect syntactic patterns can be interpreted--once they are understood--and, as we have seen, the children do learn to express the basic semantic relationships.

Even single words can serve as cues. But the communication game gets stalled in the mire of jumbled sounds as the listener guesses at the meaning, asks for confirmation, guesses again, flounders helplessly when she is unable to hit upon the intent and ruefully gives up and takes another tack. Meantime, the child may try persistently, if long experience has not already discouraged her, and then turn away disappointed or angry or annoyed--Kathy's "you don't know nothing" is an example of this. Certainly, experience would not lead to the expectation that she would be understood. In all these detours the conversation tends to get side-tracked. Most people do not undertake ordinary conversation with these children because of the mutual frustration. On the contrary, "conversation" is interpreted as question-and-answer, i.e. a question posed to which the answer is already known. Thus, the context is kept to within bounds of the "guessable."

8. Discourse Topics

Although a topic of conversation was introduced by the teacher or cottage personnel, any conversational lead by the child was followed up and permitted to develop. Four of the children spoke of home and family. Lisa spoke of her visits with her own family and this was reality-based because they do take her home regularly. Kathy spoke of "Daddy" who was her teacher's father, but from the evidence on the tape one could not be certain whether she knew that this was not her own Daddy. Randi spoke of going "home" in both taping sessions. She said that her mommy would be coming to see her for the holiday and give her all sorts of

presents. She also said she was going to her sister's house and that at home she had a new pair of shoes and a blue watch. Randi, of course, has not seen her own family in many years. In 1974, a recreation assistant took an interest in Randi and took her out half a dozen times for an afternoon's visit and once overnight at Christmastime. Since then interest has tapered off, the young lady no longer works at the institution, and there have been no visits at all during 1976. Nevertheless, Randi still fantasizes about "my mommy" and "my sister."

Janice has intricate fantasies about her family. There has been no actual contact or interest since she was institutionalized when she was a year old. Neither has there been a foster parent or surrogate who has taken a sustained interest. She has been out of the institution only on Girl Scout camping trips. At both taping sessions she brought up the topic of her family. Aside from the pathos, her remarks give some insight into the confusion of the semantic boundaries of the terms "sister" and "brother." For example, in one exchange she was asked if she had any brothers or sisters. "Yup. Just one. I got Amy Carol. Carol's got long hair." (You have two sisters?) "Yeah, have one a brother. One sister. Yeah, she working in the church with us. She's Protestant with me. She works in the church with us. Yeah, Mrs. Van. Yup that's my brother." Elsewhere, as has been recorded previously she elaborated on her fantasy of having gone home for Christmas. These rather sad fantasies at least give us some hint of an inner life which is perhaps not quite as barren as one might have assumed.

C. Discourse Organization

In the example given above, it might appear that all those comments had been forthcoming sequentially with only one prompt. Nothing could be further from the truth. Each sentence was punctuated by a question, a repetition or comment from the interlocuter. Typically only one thought is presented at a time. To get additional information one must prompt and probe and question. This is a typical exchange:

Attendant:	What do you do at Camp Meyers?
Kathy: Sing	
	You sing.
Ride on bus.	
	Ride a bus. Don't you learn how to cook?
Yeah	
	And what do you make?
Ham and hot dog.	
	And what else? There's something else Mrs. D. teaches you.
Stew	
	That's right. What do you make it with?
A spoon.	

This poverty of ideas and concreteness of reference are not linguistic deficits per se. As we have seen, Kathy is capable of constructing complex sentences. Assuming that she knew, we could by further probing have elicited the information that you put meat and potatoes in a stew. But Kathy could never get these ideas all together and say: "I make stew. I put in meat and potatoes. I stir with a spoon." She could not organize this information (which

she knows) without the help of prompting questions to which she can give discrete responses. The questions help to structure the information. The defect appears more cognitive than linguistic.

Summary

This study has attempted to describe the language of early-institutionalized Down's Syndrome subjects from childhood to young adulthood. The main instrument of the analysis has been the semantic-syntactic theory of language development proposed by Roger Brown and applied to a language sample obtained by informal conversation with each child. In addition, tests have been administered to inquire more directly into the comprehension of certain syntactic structures and to evaluate the results of a non-verbal intelligence test as compared to a standard verbal intelligence test. The following conclusions may be drawn from this study:

1. The subjects of this study, as hypothesized, have learned what Brown (1973) calls the "main business" of the Stage I child: they expressed the eight basic semantic relationships, they used the negative, question and imperative modes, they controlled proper word order and, as a group, their mean length of utterance did not exceed 2.0.

2. As hypothesized, the subjects of this study attain variable levels of control of the fourteen grammatical morphemes which emerge during Stage II. In their spontaneous speech they use the primitive Present Progressive, the Prepositions "in" and "on", the Articles, and the Past Irregular forms of some verbs.

They use the Contractible negative modal Auxiliaries, but rarely the Contractible allomorphs of the Auxiliary "be." To a limited extent they use the Uncontractible Auxiliary "be," the Plurals and the Uncontractible and Contractible Copula. They make little or no use of the Past Regular Inflection, the Possessive inflection and the 3rd Person singular Regular and Irregular inflections.

3. The subjects of this study, as hypothesized, differ from the Stage I normal child in that they use some semantic relationships not commonly found at that level, for example, those expressed by adverbs of time and manner. They also use many more state verbs with Experiencer-Person Affected Subjects than do young normal children. Among the older subjects, the Indirect-Object Dative is expressed frequently. The most notable way in which these Subjects differ from the normal Stage I child is in the use of complex embedded and coordinate sentences.

4. Within the limits of their language levels, these subjects use rule-governed linguistic behavior. They almost never make a mistake in word order. They express properly the functions of Agent-Action-Object. As can be seen by the behavior of the oldest subject in forming the past tense, she has deduced a rule which is incorrect, but which she nevertheless follows as a rule. There certainly are legitimate questions about whether they know some specific rules, such as the rule governing pluralizing or whether they use some plural forms which are learned by rote. However, it may be said that the basic structure of their language is rule governed.

5. There were no significant differences between MA scores on the performance intelligence test as compared to the verbal intelligence test. In this study, therefore, a verbal intelligence test did not unduly penalize the Down's Syndrome subjects. There was no evidence that they were more handicapped in the area of language development than in perceptual and perceptual-motor development.

6. The Miller-Yoder Test of Comprehension was unreliable as a measure of comprehension because, apparently, the Down's subjects did not listen to, or attend to purely linguistic cues, but tended to respond erratically to some peripheral aspect of the test situation.

7. These Down's Syndrome subjects, in addition to their limited linguistic abilities are greatly handicapped by their grossly distorted articulation and their inability to organize ideas into complex sequences.

BIBLIOGRAPHY

Benda, Clemens E. Down's Syndrome: Mongolism and Its Management. New York: Grune and Stratton, 1969.

Bilovsky, D. and Share, J. The ITPA and Down's syndrome: An exploratory study, American Journal of Mental Deficiency. 1965, 70, 1, 78-82.

Blanchard, I. Speech pattern and etiology in mental retardation, American Journal of Mental Deficiency. 1964, 68, 5, 612-617.

Bloom, L. Language Development: Form and Function in Emerging Grammars. Cambridge, Mass.: MIT Press, 1970.

Bloom, L.; Miller, P.; and Hood, L. Variation and reduction as aspects of competence in language development. The 1974 Minnesota Symposium on Child Psychology. Edited by A. Pick. Minneapolis: University of Minnesota Press.

Bloom L.; Lightbown, P.; and Hood, L. Structure and variation in child language. Monographs of the Society for Research in Child Development. University of Chicago Press, May 1975.

Blount, W. R. Language and the more severely retarded: A review. American Journal of Mental Deficiency. 1968, 73, 1, 21-19.

Bowlby, J. The nature of a child's tie to his mother. International Journal of Psycho-Analysis. 39, 350-373.

Braine, Martin, D. S. The ontogeny of English phrase structure: The first phase. Language, 1963, 39,1-14.

Bricker, W. A. A systematic approach to language training. Language of the Mentally Retarded. Edited by R. L. Schiefelbush. Baltimore: University Park Press, 1972.

Brown, Roger. A First Language - The Early Stages. Cambridge, Mass.: Harvard University Press, 1973.

Bruner, J. A. The ontogenesis of speech acts. Journal of Child Language, 1975, 2, 1-19.

Cain, L. F. and Levine, S. Effects of community and institutional school programs on trainable mentally retarded children, Research Monograph. The Council for Exceptional Children, Series B, No. B-1, 1963.

Centerwall, S. A. and Centerwall, W. R. A study of children with mongolism reared in the home compared to those reared in the community. Pediatrics, 1960, 25, 678-685.

Chafe, Wallace, L. Meaning and the Structure of Language. Chicago: The University of Chicago Press, 1970.

Clausen, J. Behavioral characteristics of Down's Syndrome subjects. American Journal of Mental Deficiency, 1974, 78, 5, 571-577.

Cornwell, A. C. Development of language, abstraction and numerical concept formation in Down's syndrome children. American Journal of Mental Deficiency, 1974, 79, 2, 179-190.

Cornwell, A. C. and Birch, H. J. Psychological and social development in home-reared children with Down's syndrome (Mongolism). American Journal of Mental Deficiency, 1969, 74, 3, 341-350.

Cromer, R. F. Are subnormals linguistic adults? Language, Cognitive Deficits and Retardation. Edited by N. O'Connor London: Butterworth, 1975.

Dingman, H. F. and Meyers, C. S. Structure of intellect in the mental retardate. International Review of Mental Retardation. Edited by N. R. Ellis. New York: Academic Press, 1966.

Dodd, B. Recognition and reproduction of words by Down's syndrome and non-Down's syndrome retarded children. American Journal of Mental Deficiency, 1975, 80, 3, 306-311.

Eilers, R. E. Speech discrimination in young Down's children. Presentation to American Speech and Hearing Association Convention, 1975, Washington, D. C.

Engler, M. Mongolism. Baltimore: Williams and Wilkins, 1949.

Evans, D. and Hampson, M. The language of mongols. British Journal of Disorders of Communication, 1968, 3, 2, 171-181.

Fillmore, Charles J. The case for case. Universals in Linguistic Theory. Edited by E. Bach and R. T. Harms. New York: Holt Rinehart and Winston, 1968, 1-87.

Fishler, K. Mental development in mosaic Down's syndrome as compared with Trisomy 21. Down's Syndrome (Mongolism). Edited by R. Koch and F. de la Cruz New York: Brunner/Mazel, Inc., 1975.

Fishler, K.; Share, J.; and Koch, R. Adaptation of Gesell developmental scales for evaluation of development in children with Down's Syndrome (mongolism). American Journal of Mental Deficiency, 1964, 68, 5, 642-646.

Gesell, A. and Amatruda, C. A. Developmental Diagnosis. New York, New York: Harper & Row, 1947.

Ginsburg, H. and Opper, S. Piaget's Theory of Intellectual Development - An Introduction. Englewood Cliffs, N. J.: Prentice-Hall, Inc., 1969.

Hubschman, E. Changes in performance on the ITPA. Presentation at 92nd Annual Convention, American Association on Mental Deficiency, 1968.

Hubschman, E. Improvement of language skills in retarded children. Public Health Service Grant No. 5 R20 MR 02030-06. 1970.

Hubschman, E.; Polizzotto, E.; and Kaliski, M. S. Performance of institutionalized retardates on the PPVT and the ITPA. American Journal of Mental Deficiency, 1970. 74, 4, 579-580.

Johnson, O. T. and Olley, J. G. Behavioral comparisons of Mongoloid and non-Mongoloid retarded persons: A review. American Journal of Mental Deficiency, 1971, 75, 5, 546-559.

Johnson, R. C. and Abelson, R. E. Intellectual, behavioral, and physical characteristics associated with trisomy, translocation and mosaic types. American Journal of Mental Deficiency, 1969, 73, 6, 852-855.

Johnston, J. R. and Schery, T. K. The use of grammatical morphemes by children with communication disorders. Normal and Deficient Child Language. Edited by D. M. Morehead and A. E. Morehead. Baltimore: University Park Press, 1976.

Jordan, T. A. Language and mental retardation: A review of the literature. Language and Mental Retardation. Edited by R. L. Schiefelbusch; R. H. Copeland; and J. O. Smith. New York: Holt, Rinehart and Winston, Inc., 1967.

Kent, Louise; Klein, D.; Falk, A.; and Guenther, H. Language Acquisition Program for the Retarded. Language Intervention with the retarded. Edited by J. D. McLean; D. E. Yoder; and R. L. Schiefelbusch. Baltimore: University Park Press, 1972.

Kolstoe, O. P. Language training of low-grade mongoloid children. American Journal of Mental Deficiency, 1958, 63, 1, 17-30.

Lackner, J. R. A developmental study of language behavior in retarded children. Neuropsychologia, 1968, 6, 301-320.

Lee, Laura L. Developmental Sentence Analysis. Evanston: Northwestern University Press, 1974.

Lennaberg, E. H.: Nichols, I. A.: and Rosenberger, E. F. Primitive stages of language development in mongoliism. Disorders of Communication. Edited by D. McK. Rioch and E. A. Weinstein. Baltimore: The Williams and Wilkins Co., 1964.

Limber, J. The genesis of complex sentences. Cognitive Development and the Acquisition of Language. Edited by T. E. Moore. New York: Academic Press, 1973.

Longhurst, T. M. and Grubb, S. A comparison of language samples collected in four situations. Language Speech and Hearing Services in Schools, Vol. V, No. 2, 1974.

Lyle, J. G. A comparison of the verbal intelligence of normal and imbecile children. Journal of Genetic Psychology, 1961. 99, 227-234.

Lyle, J. G. Comparison of the language of normal and imbecile children. Journal of Mental Deficiency Research, 1961, 5, 1, 40-51.

Lyle, J. G. The effect of an institution environment upon the verbal development of imbecile children. Journal of Mental Deficiency Research, 1959, 3, 2.

Lyle, J. G. The effect of an institution environment upon the verbal development of imbecile children. Journal of Mental Deficiency Research, 1960, 4, 1.

MacDonald, James D.; Blott, J. P.; Gordon, K.; Spiegel, B.; and Hartmann, M. An experimental parent-assisted treatment program for pre-school language-delayed children. Journal of Speech and Hearing Disorders, 1974, 39, 4, 395-415.

Mahoney, Gerald J. Ethological approach to delayed language acquisition. American Journal of Mental Deficiency, 1975, 80, 2, 139-148.

Masland, R. L.; Sarason, S. B.; and Gladwin, T. Mental Subnormality. New York: Basic Books, Inc., 1958.

McCarthy, D. Language development in children. Manual of Child Psychology, 2nd Edition. Edited by L. Carmichael. New York: John Wiley & Sons, Inc., 1954.

McCarthy, J. McR. Patterns of psycholinguistic development of Mongoloid and non-Mongoloid severely retarded children. Doctoral Dissertation, University of Illinois, 1965.

McCarthy, J. J. Research on the linguistic problems of the mentally retarded. Mental Retardation Abstracts, Vol. 1, No. 1, 1964. U. S. Department of Health, Education and Welfare. Bethesda, Maryland.

McNeill, David. The Acquisition of Language: The Study of Developmental Psycholinguistics. New York: Harper and Row, 1970.

Main, R. A study of the oral vocabularies of severely subnormal patients - Grammatical analysis of speech samples. Journal of Mental Deficiency Research, 1961, 5, 1, 52-59.

Melyn, M. A. and White, D. T. Mental and developmental milestones of non-institutionalized Down's Syndrome children. Pediatrics, 1973, 52, 4, 542-545.

Miller, J. F. and Yoder, D. E. An ontogenetic language teaching strategy for retarded children. Language Perspectives - Acquisition, Retardation and Intervention. Edited by R. L. Schiefelbusch and L. L. Lloyd. Baltimore: University Park Press, 1974.

Miller, J. F. and Yoder, D. E. Assessing the comprehension of grammatical form in mentally retarded children. Paper presented to the Third Congress of the International Association for the Scientific Study of Mental Deficiency. The Hague, 1973.

Mueller, M. W. and Weaver, S. J. Psycholinguistic abilities of institutionalized and non-institutionalized trainable mental retardates. American Journal of Mental Deficiency, 1964, 68, 775-783.

Nice, M. M. Length of sentences as a criterion of a child's progress in speech. Journal of Educational Psychology, 16, 370-379.

O'Connor, N. Cognitive processes and language ability of the severely retarded. Foundations of Language Development. Edited by Lenneberg, E. H. and Lenneberg, E. New York: Academic Press, 1975.

O'Connor, N. and Hermelin, B. Speech and Thought in Severe Subnormality. New York: Pergamon Press, Ltd., The Macmillan Company, 1963.

Rhodes, L.; Gooch, B.; Siegelman, E.; Behrns, C.; and Metzger, R. A language stimulation and reading program for severely retarded mongoloid children: A descriptive report, California Mental Health Research Monograph No. 11, Department of Mental Hygiene, 1969.

Ryan, J. Mental subnormality and language development. Foundations of Language Development, Vol. 2. Edited by E. H. Lenneberg and E. Lenneberg. New York: Academic Press, 1975.

Schiefelbusch, R. L.: Bair, H. W.; Spradlin, J. E.; et. al. Language studies of mentally retarded children. Journal of Speech and Hearing Disorders, Monograph Supplement, No. 10, 1963.

Schlanger, B. B. Environmental influences on the verbal output of mentally retarded children. Journal of Speech and Hearing Disorders, 1954, 19, 3, 339-343.

Schlanger, B. B. Oral language classification of the Training School residents. The Training School Bulletin, 1957.

Schlanger, B. B. Speech examination of a group of institutionalized mentally handicapped children. Journal of Speech and Hearing Disorders, 1953, 18, 339-349.

Schlanger, B. B. Speech measurements of institutionalized mentally handicapped children. American Journal of Mental Deficiency, 1953, 58, 1.

Schlanger, B. B. and Gottsleben, R. H. Analysis of speech defects among the institutionalized mentally retarded. Journal of Speech and Hearing Disorders, 1957, 22, 1.

Schlesinger, I. M. Production of utterances and language acquisition. The Ontogenesis of Grammar. Edited by D. I. Slobin. New York: Academic Press, 1971, 63-101.

Seitz, Sue. Language intervention, changing the language environment of the retarded child. Down's Syndrome (Mongolism) Research, Prevention, Management. Edited by R. Koch and F. de la Cruz. New York: Brunner/Mazel, 1975.

Semmel, M. I. and Dolley, D. G. Comprehension and imitation of sentences by Down's syndrome children as a function of transformational complexity. American Journal of Mental Deficiency, 1971, 75, 6, 739-745.

Share, J. B. Development progress in Down's Syndrome. Down's Syndrome (Mongolism). Edited by R. Koch and F. de la Cruz. New York: Brunner/Mazel, 1975.

Share, J. B.; Koch, R.; Webb, A.; and Graliker, B. The longitudinal development of infants and young children with Down's Syndrome (Mongolism). American Journal of Mental Deficiency, 1964, 68, 6, 685-692.

Shipe, D. and Shotwell, A. M. Effects of out-of-home care on Mongoloid children. A continuation study. American Journal of Mental Deficiency, 1965, 69, 5, 649-652.

Shipe, D.; Reisman, E. E.; Chung, C-Y; Darnell, A.; and Kelly S. The relationship between cytogenetic constitution, physical stigmata and intelligence in Down's syndrome. American Journal of Mental Deficiency, 1968, 72, 6, 789-797.

Shotwell, A. M. and Shipe, D. Effect of out-of-home care on the intellectual and social development of Mongoloid children, American Journal of Mental Deficiency, 1964, 68, 693-699.

Sievers, D. J. and Esse, S. H. Language development in institutionalized and community mentally retarded children. American Journal of Mental Deficiency, 1961, 66, 413-420.

Slobin, D. I. Cognitive prerequisites for the development of grammar. Studies of Child Language Development. Edited by C. A. Fergus and D. I. Slobin. New York: Holt, Rinehart and Winston, Inc., 1973.

Slosson, Richard L. Slosson Intelligence Test for Children and Adults. East Aurora, New York: Slosson Educational Publications, 1963.

Smith, G. F. Present approaches to therapy in Down's syndrome. Down's Syndrome (Mongolism). Edited by R. Koch and F. de la Cruz. New York: Brunner/Mazel, 1975.

Smith, N. V. Universal tendencies in the child's acquisition of phonology. Language, Cognitive Deficits and Retardation. Edited by N. O'Connor. London: Butterworth & Co., 1975.

Spradlin, J. E. Language and communication of mental defectives. Handbook of Mental Deficiency. Edited by N. R. Ellis. New York: McGraw-Hill, Inc., 1963.

Stanford University. Papers and Reports on Child Language Development, Special Issue: Language Disorders in Children. Stanford, California: Institute for Childhood Aphasia, Number 4, June 1972.

Stein, Zena A. Family planning as a method of prevention. Down's Syndrome (Mongolism) - Research, Prevention, Management. Edited by R. Koch and F. de la Cruz. New York: Brunner/Mazel, 1975.

Strazzulla, M. Speech problems of the mongoloid child. Quarterly Review of Pediatrics, 1953, 8, 268-273.

Streng, A. H. Syntax, speech and hearing. New York: Grune & Stratton, 1972.

Tinbergen, E. A./Tinbergen, N. Early Childhood Autism - An Ethological Approach. Advances in Ethology Supplements to Journal of Comparative Ethology, No. 10. Berlin: Paul Parey, 1972.

Zekulin, X. Y.; Gibson, D.; Mosley, J. L.; and Brown, R. I. Auditory-motor channeling in Down's Syndrome subjects. American Journal of Mental Deficiency, 1974, 78, 5, 571-577.

Zisk, P. M. and Sisler, I. Speech and language problems in Mongolism: A review. Journal of Speech and Hearing Disorders, 1967, 32, 3, 228-241.