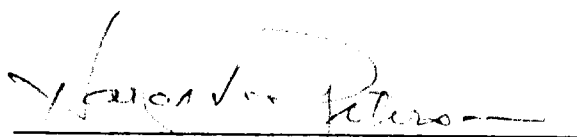


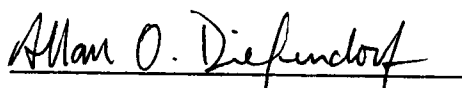
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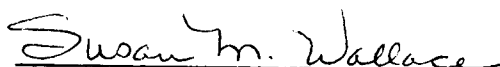
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Harold A. Peterson, Major Professor

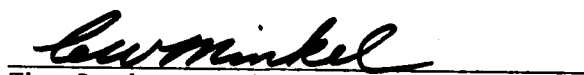
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Accepted for the Council:


The Graduate School

A PRAGMATIC LANGUAGE STUDY OF PRONOUN COMPREHENSION
OF DOWN SYNDROME AND NORMAL CHILDREN WITH
MENTAL AGES TWO AND ONE-HALF
THROUGH SIX YEARS

A Thesis
Presented for the
Master of Arts
Degree
The University of Tennessee, Knoxville

Mark C. Clark

March 1984

ACKNOWLEDGMENTS

I would like to express my sincerest appreciation to Harold A. Peterson, Ph.D., for his continuous support throughout my years here, for his understanding and intuitive abilities to know my thoughts without always having to put them into words and for his unbelievable patience with this sometimes irrational human being. For their continuous support, thoughtful insights and helpful guidance, I also want to thank Dr. Sol Adler and Dr. Allen Diefendorf. A special note of thanks is extended to Ms. Susan M. Wallace of the Birth Defects and Human Development Center, for without her interest and support this thesis would not have been completed. Thanks are also extended to Ms. Deborah King of the Pediatric Language Clinic and Ms. Bobbi Beckman of Daniel Arthur Rehabilitation Center for all their practical help and support.

ABSTRACT

The purpose of this study was to compare the pronominalization patterns of Down Syndrome (nondisjunction type) and mentally matched normal children when context and stress were systematically manipulated.

Eighteen sentences were devised using three nouns (lion, tiger, bear) and three verbs (hit, pushed, kicked). Each sentence contained one or two deictic pronouns in a subordinate clause. Stress or emphasis was differentially applied to the pronoun in either the subject or object position of the sentence.

Ten normal children (MAs between 2-11 to 5-9) were matched (within ± 3 months) to the Down Syndrome (DS) children according to MAs calculated by the Peabody Picture Vocabulary Test Revised (PPVT-R). All Ss passed a hearing screening and tympanometry and the normals additionally scored at or above the 25th percentile on the Revised Northwestern Syntax Screening Test.

In the experimental procedure the Ss were first measured on their understanding of all 17 pronouns tested in the Vocabulary Comprehension Scale (VCS). Then the Ss demonstrated their understanding of differentially stressed deictic pronoun sentences by physical manipulation of three toy animals.

Data were the percentages of responses to the VCS and the eighteen deictic pronoun sentences. Data were evaluated to determine (1) differences between DS and normal children in the percentage of pronouns identified on the VCS, (2) differences between DS and normal children's

pattern of pronominal reference when presented with an unstressed or stressed deictic pronoun in either the subject or object position of a subordinate clause of a sentence.

It was determined that DS and normal children displayed no significant differences in the number of pronouns correctly identified on the VCS when mentally matched according to the PPVT-R.

It was determined that depending on the context DS and normal children differ in their interpretation of stress when presented with a deictic pronoun in both the subject or object position of a subordinate clause.

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CHAPTER I

INTRODUCTION

Over the years the definition of language has been broadened and delineated. Recently the American Speech-Language-Hearing Association (ASHA) presented the following definition:

Language is a complex and dynamic system of conventional symbols that is used in various modes of thought and communication. . . . Language evolves within specific historical, sound and cultural contexts; language, as rule governed behavior, is described by at least five parameters: phonologic, morphologic, syntactic, semantic, and pragmatic. (ASHA, 1983)

The development of language skills may be studied through the observation of general linguistic behavior or through the emergence of a particular grammatical system. The current study is concerned with the latter, namely the emergence of pronouns within a pragmatic framework.

Pragmatics is defined as a set of rules governing the use of language within a context (Bates, 1976). Therefore, individuals choose their semantics to fit the context and thus build meaning onto these contexts so the two become inseparable. Pragmatic researchers propose that pragmatics as well as semantics is learned through a "context-based act" rather than an "object or referent-based act" (Bates, 1976).

To discern the pragmatic meaning of a linguistic situation, Carol Chomsky (1973) employed a unique method for studying the syntactic/semantic forms of children's utterances. She alluded to the child's pragmatic understanding affecting the child's language by stating that "children fail not because of a lack of understanding, they understand

them [the sentences] they just understand them wrongly" (p. 7). Stated differently, the children that Chomsky tested understood and applied the wrong interpretation to a given communication act.

Chomsky's procedure allowed the child to actively reconstruct his/her concept of the linguistic and pragmatic composition of a statement when presented. Bates asserts pragmatic meanings are actively constructed through the child's attempts to engage in social interaction. Chomsky's format allows the child in each speech act to construct meanings through a pragmatic (context) based act. This method is similar in concept to the normal acquisition attempts of a child to understand the world around him/her.

In mental retardation, language disorders consist not only of errors of production (i.e., speech sounds, words, or sequences) but also difficulties with the cognitive processes of abstraction, in particular of symbols and meaning, as well as the cognitive system of rules that link these together.

In research dealing with the mentally retarded one repeatedly finds that their acquisition of language is typically slower, but that it proceeds in a normal developmental sequence. Various investigators have supported this concept (Coggens, 1979; Lacker, 1968; Newfield & Schlanger, 1968; Lenneberg, 1964; Byrne, 1959).

Researchers that hold the opposing view claim that qualitative differences in language become apparent if, according to Stoel-Gammon (1980), researchers focus on the process underlying development. Cognitive and linguistic investigations have shown differences between normal

and retarded children in the areas of organizational and problem solving strategies (Das, 1976; Millgram, 1972; Semmel & Bennett, 1970; Inhelder, 1968; Cromer, 1972).

In summary it is clear that the nonretarded child does not totally rely on linguistic content of an utterance in order to comprehend it. They seem to take into account "contextual [pragmatic] information and use their knowledge of the real world to determine the meaning a speaker is trying to convey" (Deward, 1979).

Linguistic comprehension studies of the mentally retarded, according to Wheldale (1976), have centered on either understanding of a single word or assessment of a certain linguistic structure. Deward (1981) reports that no attempts have been made to study the processes involved in a retarded person's comprehension of language to determine whether "there are differences in the way they attempt to impose meaning on linguistic input" (p. 177). Deward suggests that while it is very likely that subtle semantic constraints and situational cues could escape the retarded child studies showing qualitative differences suggest that "retarded children can and do make use of likely relationships between potential actors and objects to guide them in understanding a sentence" (p. 182).

Mental retardation and language delay may have according to Adler (1976), a wide variety of etiologies and a wide variety of patterns of sequelae mandated in part by the genetic attributes of a particular syndrome. One relatively homogenous group of mentally retarded children, however, are the result of a genetic imbalance (that is the

result of additional genetic material in the cells of the body) and are identified as Down Syndrome^{*} nondisjunction type children. Due to this relative homogeneity a determination of how these children make pragmatic interpretations from context may be of particular interest.

The pronoun system used by children provides a fruitful area for investigation of the conditions which allow children to make linguistic generalizations and to create pragmatic context-specificity. Pronouns have been defined by Chiat (1981) as being "a complex of semantic, syntactic and morphological distinctions whose interactions are only partially consistent" (p. 76). Noting some of these distinctions allows an investigator to chart systematic patterns, which may lead to better understanding of pronouns in terms of pragmatic language relationships.

^{*}This thesis adopts the form Down Syndrome rather than the term Downs Syndrome according to classification and nomenclature cited in the Journal of Pediatrics, July 1975, p. 161. "The possessive use of an eponym should be discontinued since the author neither had nor owned the disorder" (e.g., Down Syndrome).

CHAPTER II

REVIEW OF THE LITERATURE

Pronominalization

This portion of the literature review is divided into three sections. The first section deals with the general pattern of pronoun acquisition found in the language of children. This is followed by a discussion of the linguistic characteristics reported in the literature on pronominalization in Down Syndrome. Last is a review of some of the factors affecting pronominal skills of both normal and abnormal children including intonational stressing and syntactic structuring.

General Patterns of Pronoun Acquisition

The rationale for this investigation of pronouns is based on previous works which proposed that there is an order of emergence of pronominal distinctions. These have included personal distinctions (Clark, 1977; Deutsch & Pechman, 1978); case distinctions (Kaper, 1976; Tanz, 1974; Bellugi, 1971); or the combination of these (Chomsky, 1973; Huxley, 1970). Many of these studies focus on the complexity of different distinctions and were based primarily on the order of acquisition. However, as Chiat (1980) states "there has been little to no analysis of the kinds of generalizations which underlie these distinctions" (p. 76) in the child's speech.

One of the most common characteristic errors in children's language is the pronominal case-error. Tanz (1974), Brown (1973), and Hatch

(1969) have surveyed the data on children's errors in marking pronominal case. According to Tanz (1974) errors "are almost always in the direction of substituting an objective form (me, him, her, us) for a nominative form (I, he, she, we) and almost never in the opposite direction" (p. 177).

Analysis of semantic, syntactic and morphologic distinctions has revealed a conservative pronominal error pattern in terms of the child's generalization abilities. Maratsos (1979) and Carey (1978) suggest that the generalizations of these children are narrower than is implied in the child language literature. Chiat (1980) suggests that "children do not make maximal generalizations based on salient features, be they extralinguistic, semantic, or formal" (p. 77). Instead "children acquire specific complexes of features and apply them to a limited range of related feature complexes" (p. 77). This suggests that a feature marked as a pronoun is dependent on a sensitivity to very complex combinations of familiar features and does not require far-reaching extrapolations from limited combinations of features. Thus it seems logical to investigate different levels of ambiguity caused by pronouns in various situations. Miller's (1981) study reflects this interest in studying ambiguity. He contends that ambiguity is multileveled and each definition of ambiguity is helpful "in revealing processes that occur at different levels of information processing" (p. 133).

The acquisitional patterns of children's pronominal skills have been extensively studied by Cruttenden (1977), Chomsky (1973), Huxley

(1970), and Halliday (1969). Much of this research indicates that children's pronominal development is the result of an integrative process of cognitive development (Leonard, 1983). Cruttenden (1977) suggests that one process is morphophonemic invariational and the other is a perceptual process. Cruttenden further suggests that "isolated occurrences of a pronoun may occur in certain, often narrowly situational-bound utterances before that pronoun is used freely in many combinations" (p. 191).

Chomsky (1973) states that under normal circumstances of language use, a pronoun which refers outside of a sentence (S) to someone named in an earlier S, refers not to an abstract 'someone else' but generally to its preceding noun. In this condition a pronoun is said to be restricted. In S_1

S_1 : He found out that Mickey won the race.

the pronoun must refer to someone else outside of the S. In S_1 there is no need for an identity of this 'someone else' only that he exists. S_1 is an example of a restricted pronominal reference where no identity is required and is opposed to S_2

S_2 : After he got the candy, Mickey left.

which is an unrestricted pronominal reference. That is, the pronoun "he" could refer to either Mickey or someone else and neither is incorrect.

Chomsky proposed that the child's developmental understanding and conceptualization of pronominal distinctions begins initially as an unrestricted usage pattern. That is, in both S_1 and S_2 the young child

(generally before five years of age) will treat the pronoun as if it were unrestricted. By ages five or six years the child becomes able to note the differences between S_1 and S_2 thus he generates a rule to explain these common occurrences. Children then "operate with the simple principle that the basic function of a pronoun is to refer to what precedes it without further refinements" (p. 109). This rule then allows for understanding of S_1 as a restricted pronominal distinction. However, the rule is too general and allows for improper application such as in S_2 . Using their generated rule the child will consistently interpret an unrestricted pronoun as if it were restricted, i.e., referring to the noun that came before it. Finally children at around age six to ten years develop an adult-like interpretation of their general rule to correctly comprehend Ss with a pronominal unrestricted/restricted distinction. The developmental sequence proceeds from pronouns interpreted as unrestricted, then a rule is generated allowing for a restricted interpretation, and finally the notation that both interpretations are possible.

In general the child's pronominalization skills are more closely correlated with age than other distinctions tested by Chomsky (e.g., promise/ask, easy to see). She reports that children from the ages of five to six years learn with considerable regularity the principles of pronominalization. She postulates that pronominal reference differs from other constructions "because the rules are considerably more basic and more general" (p. 109) than that of other rules of language.

It would seem that pronominal reference rules are "qualitatively different" (p. 109) from other language rules. Perhaps "pronominalization is a basic tool to language, whereas other constructions (promise/ask, easy to see) are specialized skills" (p. 109). The pronominal reference skills "pertain to no specific word or class of words, but derive from principles which apply to whole Ss very generally" (p. 109).

Down Syndrome: Linguistic and Pronominal Skills

It is generally agreed that mental retardation is associated with a delay in the development of speech and language. However, the specific ramifications and nature of that delay are not well defined. When evaluating and comparing the speech and language development of the mentally retarded (M.R.) it is important to remember that "it is clearly inaccurate to speak about the mentally retarded as a homogeneous population, since different subgroups within the category M.R. may evidence very different language abilities" (Cromer, 1974). It is possible that some children show a delay in the onset and acquisition of language while a different subgroup develop differently following a separate pattern of acquisition. It is known that due to an autosomal chromosome disorder that occurs in Down Syndrome (nondisjunction type) children, they possess from birth a genetic imbalance which alters growth and development. Therefore one of the purposes of this study is to determine the developmental patterns of the Down Syndrome (DS) child's pronominal and pragmatic skills and to note any similarities or differences from normal children on these same skills.

Stoel-Gammon (1982) states that investigations of language development among the M.R. have generally supported two positions: "development proceeds normally, but at a slower rate than normal children; or language acquisition by M.R.'s is qualitatively different from that of the normals" (p. 341).

Researchers who support a qualitatively different developmental viewpoint (Stoel-Gammon, 1980, Das, 1976; Milgram, 1972; Cromer, 1972; Semmel & Bennett, 1970; Inhelder, 1968) claim that differences in language development become apparent if, according to Stoel-Gammon (1982), one focuses on not only what is acquired but on how it is acquired. These researchers suggest that normal children generate sentences that they have never before encountered because they understand the underlying rules necessary for linguistic creativity. These cognitive and linguistic investigators have shown differences between normals and retarded children in the areas of organizational and problem-solving strategies, abstraction, and rule formation.

The research on early prelinguistic development in DS indicates quite conclusively that there is little to no difference either qualitatively or quantitatively between normals and DS infants in the first year of life (Smith, 1981, 1977; Brown, 1972; Dodd, 1972). However, during the second year a major difference appears. The crucial linguistic milestone of the onset of meaningful speech appears different. According to Brown (1972) normal children develop the first adult-like words at approximately 13 to 15 months about the same time the child

begins to walk. Smith and Wilson (1973) report that DS children raised at home produce their first words between two to three years of age.

The linguistic abilities of the MR child have generally been assessed through their use of expressive language. It is accepted, according to Bloom and Lahey (1978), that their expressive language is poorer than their comprehension. However comprehension studies according to Wheldale (1976) have generally centered on understanding of single words or have assessed a certain linguistic structure. Deward (1979) reports that no attempts have been made to study the processes involved in a mentally retarded child's comprehension of language in order to determine whether "there are any differences in the way they [M.R.] attempt to impose meaning on linguistic input" (p. 177).

Dewart (1979) studied the strategies employed by severely retarded children (M.A. 1.83 to 7.08) on the comprehension of sentences with either active or passive voice. The results of this study indicated that both retarded children and normal children matched by mental age to the retarded children "were strongly influenced by semantic constraints operating in the sentence, with the retarded Ss tending to be more strongly influenced than the nonretarded Ss" (p. 181). Thus it could be inferred that the children used their semantic expectations as a means of comprehending an utterance. Dewart (1981) suggests that "while it is very likely that subtle semantic constraints and situational cues could escape the retarded child, . . . likely relationships between potential actors and objects guide them in understanding a sentence" (p. 224).

A nonretarded child does not rely totally on the linguistic content of an utterance in order to comprehend it. They take into account "contextual [pragmatic] information and use their knowledge of the real world to determine the meaning a speaker is trying to convey" (Dewart, 1979). Stoel-Gamman (1982) and Bates (1975, 1976) have shown that the context in which language occurs can affect comprehension and expression. Stoel-Gamman (1982) states that no studies have investigated these situational aspects in the language of the Down Syndrome child. There are at this time no specific studies dealing with the pronominal coreference abilities of DS children. It remains to be determined if the pronominal abilities of DS children are qualitatively or quantitatively different from that of the normal child of the same age.

Factors Affecting Pronominalization

As mentioned earlier one of the major factors which affects pronominalization skills according to Chomsky (1973), Bloom and Lahey (1978) and Leonard (1978) is the age of the child. With age the normal development of language in a child includes progressive mastery of a variety of language aspects.

Pragmatic skills. Chomsky (1973), Bates (1976, 1978), Bloom and Lahey (1978) and Lucas (1981) offer that pragmatics can be a very important aspect in the child's linguistic development. Pragmatics according to Miller (1978) allows the listener to ascertain the meaning of an ambiguous statement "through co-operative conventions of conversational interactions" (p. 133). Chomsky (1978) has interpreted one of these

conversational interactions to be the development of rules for pronominalization.

Cognitive factors. A number of researchers speak of cognitive factors that underlie the development of language in children (e.g., Piaget, 1962; Bloom, 1973; and McDade, 1980). Some researchers have studied and applied cognitive factors to the development of pronominalization skills.

In a study by Grober (1978) a perceptual strategy was hypothesized to underlie the comprehension of coreferenced pronouns. The prototype sentence in this study was in the form

S₃. John hit Bill and then he kicked Sam.

It was believed that when the listener was confronted with this potentially ambiguous sentence fragment he/she made use of a strategy which was termed parallel function hypothesis (PFH). The concept of PFH was first put forth by Sheldon (1974) who labeled it. The hypothesis states that "since the pronoun follows the subordinate conjunction then it could be conceived of in this sentence as the subject of that clause" (Grober, 1978). Therefore this pronoun would be interpreted as being coreferential with the grammatical subject or the sentences initial noun phrase in the main clause.

The results of Grober's study revealed that the grammatical subject was selected as the appropriate antecedent for the pronoun in over 70% of all sentences presented to 128 college students. This was taken to indicate that the listeners were relying on the strategy that was outlined above.

The PFH proposed for pronoun assignment is basically a perceptual strategy, that is the S notes the perceptual position of the pronoun in the clause and determines its function from the syntactic role it plays. Grober (1978) states that adults readily interpret these pronouns as being coreferential with the NP that has the same grammatical function, this is due to the Ss presupposition based on his formulation of the PFH.

Contrastive stress factors. In a study by Maratsos (1973) the effects of stress on the comprehension of pronominal coreference in children ages three, four, and five years old were examined. Two variables were studied, the effects on comprehension of stressing a pronoun and the effects of a pronoun being the grammatical subject or the object of a clause. The sentences had the general form:

S₄: John hit Harry and then Sarah hit him.

S₅: John hit Harry and then he hit Sarah.

Maratsos proposed that the child's interpretation of unstressed pronouns is governed by a natural cognitive strategy of maximal stability. That is, interpretation is made by imposing the least possible change from the first to the second clause.

Maratsos found that young children can comprehend ambiguous coreferenced pronouns when unstressed. He stated that "the process is some general heuristic strategy of the young child" (p. 6). Maratsos found that correct interpretation of pronouns with stress "required the user to violate this natural cognitive strategy" (p. 9). He did find that with increased age these pronouns are also correctly comprehended.

The general heuristic cognitive strategy that Maratsos outlined is similar to that of Grober's PFH model. A more recent study by Solan (1980) replicated many of the same aspects of the Maratsos study.

Solan (1980) presented five, six, and seven year old children sentences such as:

S₆: John hit Bill and then he hit Sam.

The results of this study were taken to show that a different process may operate to explain how children comprehend coreferenced pronouns and stress.

In this case the stressed pronoun was taken to signal the listener of the inappropriateness of applying normal interpretative strategies. Lieberman (1967), Harnby and Hass (1970), Bloom (1970), Brown (1973) and Asp (1984) all give abundant data to support a claim that intonation in general and contrastive stress in particular are rapidly developed in children.

Solan found that children's performance on sentences with unstressed pronouns was 60% correct (correct based on adult interpretation). This percentage was significantly poorer than their performance on stressed pronouns which was found to be at 80%.

Solan's (1980) results were taken to indicate that although children of this age have some idea of the effects of contrastive stress when dealing with coreferenced pronouns, this knowledge is at first tentative. It would seem that the best possible interpretation of the child's understanding of these coreferenced pronouns is to state as Solan (1980) that "children do employ the parallel function strategy

when they are young, and at some time abandon it at least partially, to reinstate it later" (p. 695).

This statement by Solan attests to the changing cognitive structuring of the child's mental abilities and to his/her changing language skills. Pronominal skills then could be viewed as some overlaid function of cognitive growth and as such may be an index to that child's pragmatic language abilities.

Summary

In summary this review has centered on the patterns of pronominal distinctions. The pattern that children exhibit was outlined and the most prominent aspects indicated that the development of these distinctions relates to maturation. It was noted that Chomsky (1973) outlined pronominal distinctions as developing from an unrestricted to a restricted pattern of usage in normal children. This change occurs at about age five to six years, and is developed through the advent of a rule which the child generates.

Little research data is available on the developmental patterns of language in the Down Syndrome population. That which is available is ambivalent. Some researchers speak of language differences which are quantitatively different and others allude to language differences which are qualitatively different.

Pronominal development has been related to a number of other aspects of language growth. Pragmatic and/or situational cues have alluded to an effect but no research has been put forth as to its

effects on pronominalization skills in Down Syndrome. Cognitive factors have been theorized into two different forms. One called a perceptual strategy or PFH, the other a natural cognitive strategy of least change. Finally intonational and stressing factors have been cited as affecting comprehension of pronouns of normal children.

CHAPTER III

METHODS AND PROCEDURES

The present study was designed to investigate the pronominalization abilities of DS children ages three to twelve years old. It is also sought to learn how these children comprehend coreferenced pronouns with and without stress, presented in sentences. The DS children's performance were compared with children matched for mental age to reveal if different patterns of pronominalization emerge. The children were seen for one one and one half hour session. All proceedings were conducted by the examiner in a diagnostic room at the Hearing and Speech Center of the University of Tennessee or at a diagnostic room at Daniel Arthur Rehabilitation Center in Oak Ridge, Tennessee.

This section contains a description of the subjects and the experimental materials, and the procedure for implementation of the task.

MethodsSubjects

Ten subjects (Ss) were selected from a master list of all DS children seen at the Birth Defects and Human Development Center of the University of Tennessee Memorial Research Hospital. Ten normal Ss were selected from childcare centers in the Knoxville area.

The DS Ss were selected utilizing the following criteria:

(1) chronological age between three to twelve years, (2) exhibiting Trisomy 21 (nondysjunction type) as verified by chromosomal analysis,

and (3) pass an audiological screening at 20 dB (ANSI) for the frequencies 500 Hz, 1000 Hz, and 4000 Hz and tympanometry levels between -125 to +100 millimeters of mercury. The normal Ss were selected utilizing the following criteria: (1) matching the mental age of the retarded Ss within $\pm$ three months according to the PPVT-R calculated mental age (standard score), (2) pass an audiometric screening for the frequencies 500 Hz, 1000 Hz, and 4000 Hz at 20 dB (ANSI), and (3) no reported speech or language problems and additionally scored at or above the 25th percentile on the receptive portion of the Revised Northwestern Syntax Screening Test. All Ss used in this study met the above defined criteria.

Experimental Materials

For the Vocabulary Comprehension Scale (VCS) (Bangs, 1978) only the "tea party" section was used since only this section tests comprehension of pronouns. The test was administered according to the test manual's instructions (see Appendix A for a list of test items).

In the experimental coreferenced pronoun comprehension task the Ss were presented with 18 deictic pronoun sentence trials. (A deictic pronoun indicates or points to a word whose reference is not fixed, in this case a pronoun which can refer to more than one noun.) In these sentences the pronouns were placed in either or both subject or object function. The sentences were presented with and without stress with flat inflection on the target pronoun. For a complete list of all experimental sentences used see Appendix B.

For both stressed and unstressed coreferenced test conditions toy animals were used to stimulate responses from the Ss. The toys were all introduced to the Ss as males so as to minimize possible response bias of the Ss.

Procedures

Criterion Testing

The Peabody Picture Vocabulary Test Revised (PPVT-R) was employed to calculate a mental age for all Ss. Following the instructions in the manual for administration and scoring, the raw score result was converted into a mental age through the use of tables provided in the manual.

A portable audiometer (Zenith 2A, 113A/S) was used to screen the auditory acuity for all Ss. A pure-tone screening test at 20 dB (ANSI) for the frequencies 500 Hz, 1000 Hz, and 4000 Hz was performed bilaterally as well as tympanometry (Zenith 2A, 85AR). For those Ss who could not be tested through the above mentioned behavioral procedure visual response audiometry (VRA) was used to determine hearing sensitivity. Testing was performed in a sound field testing procedure using a consistent head turn response to a visual and auditory signal. (This VRA procedure was not needed for any of the Ss used in this study.)

The control group children had no reported speech or language problems and additionally scored at or above the 25th percentile on the receptive portion of the Revised Northwestern Syntax Screening Test.

The "correct" answers to the pronoun referents were determined by the responses of a group of 13 college students to the 18 experimental sentences.

Experimental Procedures

The experimental tasks were conducted in a diagnostic room with the experimenter and the S present. Both were seated at a table with the following items present: (1) two human dolls, (2) the "tea party set" from the VCS, (3) a box under the table containing three animal toys, (4) a testing data sheet on a clipboard, and (5) a cassette tape recorder with an additional Vu meter which was attached to a stationary microphone above the Ss head.

The E identified each doll by name and then asked the child to receptively point to the toy when named. This same procedure was performed with all the objects from the "tea party set." When the S had receptively identify these items on 2 consecutive trials testing was begun. (Most of the Ss were able to identify the object after three trials.) The following instructions were given to the child:

We're going to have a party with my friends Sam and Mary. I need you to help me get things ready for the party. I'm going to tell you to do things and you are to do them. First, give me a cup. Good. Now give them a cup . . .

This procedure was followed until all items of the VCS were administered. If the child appeared not to understand the command it was stated again but only twice.

After the materials for the VCS were put away the three toy animals were brought out of the box. The child once again had to receptively identify the toys correctly on 2 consecutive trials with all three present (no S used was unable to receptively perform this task after three trials) . The Ss were then administered the experimental coreferenced sentences with the following instructions:

Now it's time to play with my friends the Lion, the Bear, and the Tiger. I'm going to say something and I want you to move them like what I said. If I said the Lion hit the Bear you do this [demonstrating with the toy] and if I said [with two animals present] the Lion hit him, you do this [demonstrating with the toy]. Now you do it. "He hit the lion." Now do "the Bear hit him."

When the child had successfully completed the task with these one clause instructions then the 18 experimental sentences were administered. The stressed and the unstressed trials were randomized with the restriction that the stressed and unstressed versions of a single sentence would not appear in immediate sequence.

Experimental Questions

1. Do the Down Syndrome (nondisjunction type) differ from mentally matched normal children in the number of correct interpretations of pronouns when tested by the Vocabulary Comprehension Scale?
2. Do Down Syndrome (nondisjunction type) children differ from a mentally matched normal children in their understanding of experimental coreferenced pronoun sentences when:
 - (a) The pronoun is in the subject function of a clause that is alternatively unstressed or stressed?
 - (b) The pronoun is in the object function of a clause that is alternatively unstressed or stressed?

CHAPTER IV

RESULTS AND DISCUSSION

Results

After criterion testing was completed the Vocabulary Comprehension Scale (VCS) "tea party" section was administered followed by 18 experimental deictic sentences (see Appendix A). The experimental Ss were 20 children between the ages of two years eleven months to eleven years five months. Table 1 presents a summary of Ss chronological age, mental age as calculated by the Peabody Picture Vocabulary Test Revised (PPVT-R); and the number of pronouns correctly identified on the VCS.

Reliability Measures

Pronoun stress was monitored with a Vu meter during the production of the 18 deictic sentences and was also checked after testing by replaying the tape recorded session and noting the deflection of the Vu meter. An unstressed pronoun registered consistently between 0 and 1⁺ dB on the Vu meter and a stressed pronoun was consistently between 2⁺ and 3⁺ dB. In addition to this monitoring the adults were asked after noting pronominal reference, to indicate on paper whether pronouns presented in sentences were stressed or unstressed. Twelve of the thirteen adults correctly indicated all the stressed pronouns. A review of this taped session also registered the same dB ranges for unstressed and stressed.

Table 1

Number of Ss in Each Group: PPVT-R MAs; Chronological Age (CA);
and the Number of Pronouns Correctly Identified from a
Total of 17 Possible Pronouns on the Vocabulary
Comprehension Scale (VCS) As Well As
Group Means

	MA	CA	VCS
<u>Group I</u>			
DS ₁	3-6	4-7	15
DS ₂	3-3	5-0	10
DS ₃	3-1	4-8	15
DS ₄	3-0	3-8	11
DS ₅	3-0	3-6	14
Group $\bar{X}$	3-2	4-3	13
<u>Group II</u>			
N ₁	3-9	3-2	15
N ₂	3-2	3-4	17
N ₃	3-2	3-3	16
N ₄	3-1	3-3	11
N ₅	2-11	3-1	15
Group $\bar{X}$	3-2	3-3	14.8
<u>Group II</u>			
DS ₆	5-9	11-5	16
DS ₇	4-10	7-10	15
DS ₈	4-9	6-6	17
DS ₉	4-8	9-3	15
DS ₁₀	4-6	6-10	15
Group $\bar{X}$	4-9	8-4	15.6
<u>Group II</u>			
N ₆	5-4	5-9	17
N ₇	5-0	4-2	17
N ₈	4-11	5-9	16
N ₉	4-9	5-9	17
N ₁₀	4-6	4-7	14
Group $\bar{X}$	4-9	5-2	16.2

Note: DS denotes Down Syndrome children. N denotes normal children. Note that according to norms from the VCS a 3 year old child should be expected to obtain a score of 9 to 10 pronouns correct; a 4 year old child should be expected to obtain a score of 14 to 15 and a 5 year old a score of 15 pronouns correct.

In order to determine the reliability of the results gained in this study four Ss, two normal and two DS children with one from each age group, were retested within three weeks after the first testing date. All tests and materials were the same as before and all testing was done by the same examiner.

The Ss, DS₃, DS₇, N₂ and N₁₀, served as the reliability Ss for this study. All but one (DS) S when tested by the VCS identified the same number of pronouns and misidentified the same pronouns as he/she did on the first testing. The percent agreement between the first and second testing on the experimental deictic sentences was DS₃ = .83, DS₇ = .77, N₂ = .94, N₁₀ = .83. There was more agreement on the one pronoun sentences than on the two pronoun sentences. However, these percentages of agreement are considered adequate to interpret the results obtained as representative of these children's pronominal reference patterns. Caution should be used when generalizing these results to other populations.

Receptive Pronoun Knowledge Based
on the Vocabulary Comprehension
Scale (VCS)

The number of pronouns correctly identified by each of the Ss was tabulated and appears in Table 1. The Ss were divided into two groups according to mental age (Group I ages range from two years eleven months to three years six months; Group II ages range from four years six months to five years nine months) and genetic makeup (Down Syndrome or normal). The number of correct pronouns identified by the DS and the normal MA matched children were compared. A t test was performed to

determine if there was a significant difference between the DS and the normal Ss in their receptive pronoun knowledge.

The t value calculated indicated no significant difference between mental age matched groups [t(4) = 1.70, $p \leq .2$ for Group I and t(4) = .589, $p \leq .6$ for Group II) in the receptive pronoun knowledge of the DS and normal Ss when tested by the VCS.

Item analysis of the responses revealed that with only one exception (a normal three year old) all Ss correctly identified the pronouns he and him. Therefore both S groups (DS and normal) had similar receptive pronoun knowledge when tested by the VCS.

Data Collected on Deictic Sentences

To provide a baseline for interpretation of the children's responses to the deictic sentences, data were collected from 13 college age adults. The pronominalization patterns exhibited by these adults were inferred to be the mature spoken model. The normal children and the DS children's pronominalization patterns could then be compared to the adult model. Data were the percentages of pronominal reference response to the 18 deictic sentences (see Appendix B for a list of sentences). Pronominal reference was determined for the children by which toy animal was physically manipulated as the actor and which was the receiver of the action. The only difference for the adult testing was that rather than physically move the toy animal they indicated on paper the proper referent (i.e., who he or him referred to).

For analysis of receptive pronominalization patterns the data used were the responses falling within each of three classifications of

pronominal reference: (1) the identified pronoun in the subordinate clause refers to the subject of the main clause, (2) the identified pronoun in the subordinate clause refers to the object in the main clause, and (3) the identified pronoun in the subordinate clause refers outside the main clause to the other or third unnamed animal not found in the main clause. Responses were analyzed according to whether the pronouns were stressed (emphasized) or not stressed (normally intoned).

Adult Pronominal Reference Pattern

The adult pattern of responses is displayed in Tables 2 and 3.

S₇: The lion hit the bear and then he hit the tiger.

Data in Table 2 illustrates that in a one pronoun sentence the adults consistently interpreted an unstressed he as if it referred to the subject of the main clause, in this case he was interpreted as referring to the lion. This pattern is identified as the parallel function hypothesis (PFH) because the he in the subordinate clause is maintained as having the same grammatical function as the subject of the main clause. This pattern was exhibited on 100% of the adult responses. When HE^{*} was stressed or emphasized in sentences like S₇ another interpretation pattern was exhibited. A stressed HE was interpreted by the adults as referring to the grammatical object of the main clause. This pattern was identified as a functional role reversal (FR). That

*A pronoun that was presented to a S within an experimental sentence with stress or emphasis is represented in this paper by all caps as in HE or HIM. A pronoun presented in an experimental sentence with no stress or normally intoned is represented by all lower case letters as in he or him.

Table 2

Adult Percentages of Response to One Pronoun Deictic Sentences
for Both Second and Third Person Pronouns Unstressed
(Normally Intoned) and Stressed (Emphasized)

Refers to the main clause	S ₇		S ₈	
	he unstressed ¹	HE stressed ²	him unstressed ³	4
Subject (PFH)	100	.03	(FR) .38	
Object (FR)	00	.97	(PFH) .62	

¹The lion hit the bear and then he hit the tiger.

²The lion hit the bear and then HE hit the tiger.

³The bear hit the tiger and then the lion hit him.

⁴Stress not tested in this context.

Note: PFH denotes parallel function hypothesis.

FR denotes functional role reversal.

Table 3

Adult Percentages of Response to Two Pronoun Deictic Sentences for Both Second and Third Person Pronouns Unstressed and Stressed When One of the Two Pronouns Was Stressed and for Second and Third Person Pronouns Presented in the Same Sentence with Neither Pronoun Stressed

Refers to the main clause	he unstressed ¹	HE stressed ²		him unstressed ³	HIM stressed ⁴
		S ₉			
Subject (PFH)	.92	.00	(FR)	.03	.08
Object (FR)	.03	.03	(PFH)	.97	.03
Other (AFR)	.05	.97	(AFR)	.00	.89
		S ₁₀			
Subject (PFH)	.13 ⁵		(FR)	.28 ⁶	
Object (FR)	.41		(PFH)	.49	
Other (AFR)	.46		(AFR)	.23	

¹The tiger his the lion and then he hit HIM.

²The lion hit the bear and then HE hit him.

³The lion hit the bear and then HE hit him.

⁴The tiger hit the lion and then he hit HIM.

⁵The bear hit the tiger and then he hit him.

⁶The bear hit the tiger and then he hit him.

Note: PFH denotes parallel function hypothesis. FR denotes functional role reversal. AFR denotes alternative functional reference to the other or third unnamed alternative character not found in the main clause.

is, the stressed pronoun signaled the S to abandon the strategy of PFH and choose an alternative referent for the pronoun by reversal of the functional grammatical roles present in the main clause.

S₈: The bear hit the tiger and then the lion hit him.

In S₈ the third person pronominal form him was presented in the object position of the subordinate clause without stress. The adults exhibited less agreement in pronominal reference for these sentences. Approximately eight out of thirteen adults (62% of their responses) used the PFH to determine reference. Clearly the manner of pronominal reference for these sentences is less restricted for the object function pronoun, him than for the subject function pronoun he.

S₉: The lion hit the bear and then he hit him.

In S₉ when the pronoun he was not stressed (Table 3) the interpretation was again to the PFH. That is, the lion was understood as the referent on 92% of the responses. When HE was stressed or emphasized in a sentence with two pronouns, the functional subject role of reference was markedly different. Now, the referent for the pronoun HE was to the other or unnamed animal (in this case the tiger) and the previously named referents did not change functional roles. This pattern was identified as the alternative functional reference (AFR) pattern. This pattern of reference was displayed in 97% of the responses to the pronoun HE. When the pronoun HIM was stressed or emphasized the same alternative functional reference (AFR) was placed into operation. Stressed HIM was chosen as referring to the tiger on 89% of the responses. Unstressed him was interpreted as PFH on 97% of the responses.

S₁₀: The bear hit the tiger and then he hit him.

In S₁₀ when both pronouns were presented without stress (Table 3) adults treated the pronominal reference in a relatively unrestricted manner. Only 13% of the responses treated he as parallel with the subject of the main clause (PFH). The bulk of the responses were nearly equally divided between the pronoun referring to the object of the main clause (FR = 41%) and the third unnamed character (AFR = 46%). Nearly half (49%) of the interpretations of the unstressed him responses followed PFH. The remainder was equally divided between the subject of the main clause (28% FR) and the third unnamed character (23% AFR) as the chosen referent.

Summary of adult pronominalization patterns. The adults' pronominal referents for the one pronoun sentences were restricted. This pronominal restriction was exhibited in two different patterns, that of parallel function hypothesis (PFH) or functional role reversal (FR) and was triggered by emphasis. In sentences where a single pronoun was presented normally intoned the adults utilized the PFH pattern for determination of the referent. In sentences where the single pronoun was stressed in a subject position the PFH was abandoned and a functional role reversal occurred (see Table 2).

In sentences with two pronouns in the subordinate clause and when only one of the two was stressed, a restricted manner of pronominal reference was exhibited. Both subject and object pronouns changed roles when stressed. A pattern of PFH operated for the pronoun which was not stressed. When the pronoun was stressed the reference pattern displayed

was AFR, where the referent for the pronoun was outside of the main clause to the third or unnamed character.

In the two pronoun sentences where both pronouns were unstressed in the subordinate clause, the referent interpretations are unrestricted (i.e., the pronouns are apparently ambiguous to adults). Throughout these response data, stress is consistently treated by the adults as a disambiguating semantic cue.

The primary purpose of this study was to compare the performance of children with Down Syndrome to normal children matched on mental age scores. The adults were used as a baseline from which to chart the children's pronominal reference.

Normal Children's Pronominal Reference Pattern

In order to determine whether there were changes in pronominalization patterns with age, two subgroups were formed according to mental age (MA) as calculated by the PPVT-R scores. Group I consisted of five children with MAs from two years eleven months to three years nine months of age. Group II consisted of five children with MAs from four years six months to five years four months (see Table 1, p. 24). The normal children's pattern of pronominalization is displayed in Tables 4 through 6.

S₇: The lion hit the bear and then he hit the tiger.

The normal children in Group I and Group II reacted somewhat similarly to the adults when presented with one unstressed pronoun. That is, the normal children displayed at least a slight preference (53%) for the parallel function hypothesis (PFH) for the subject pronoun

Table 4

Group I Normal Children with MAS between 2-11 to 3-9 and
 Group II Normal Children with MAS between 4-6 to 5-4 on
 Percentages of Response to One Pronoun Deictic
 Sentences for Both Second and Third Person
 Pronouns, Where One of the Two Pronouns
 Is Stressed

Refers to the main clause	<u>S₇</u>			<u>S₈</u>	
	he unstressed ¹	HE stressed ²		him unstressed ³	
<u>Group I</u>					
Subject (PFH)	.53	.27	(FR)	.53	
Object (FR)	.47	.60	(PFH)	.47	
Error*	.00	.13		.00	
<u>Group II</u>					
Subject (PFH)	.53	.13	(FR)	.93	
Object (FR)	.40	.80	(PFH)	.07	
Error*	.07	.07		.00	

¹The lion hit the bear and then he hit the tiger.

²The lion hit the bear and then HE hit the tiger.

³The bear hit the tiger and then the lion hit him.

*Error indicates that a S replaced the pronoun with a third (unnamed) character not found in the main clause and ignored the named object found in the subordinate clause by replacing it with one of the characters found in the main clause. PFH denotes parallel function hypothesis and FR denotes functional role reversal.

Table 5

Group I Normal Children with MAS between 2-11 to 3-9 and
 Group II Normal Children with MAS between 4-5 to 5-4 on
 Percentages of Response to Two Pronoun Deictic
 Sentences for Second and Third Person
 Pronouns, Where One of the Two
 Pronouns Is Stressed

Refers to the main clause	S ₉			
	he unstressed ¹	HE stressed ²	him unstressed ³	HIM stressed ⁴
<u>Group I</u>				
Subject (PFH)	.20	.27 (FR)	.47	.60
Object (FR)	.47	.60 (PFH)	.20	.33
Other (AFR)	.33	.13 (AFR)	.33	.07
<u>Group II</u>				
Subject (PFH)	.20	.07 (FR)	.93	.80
Object (FR)	.60	.80 (PFH)	.00	.20
Other (AFR)	.20	.13 (AFR)	.07	.00

¹The tiger hit the lion and then he hit HIM.

²The lion hit the tiger and then HE hit him.

³The lion hit the tiger and then HE hit him.

⁴The tiger hit the lion and then he hit HIM.

Note: PFH denotes parallel function hypothesis; FR denotes functional role reversal and AFR denotes alternative function reference to the other or third unnamed alternative character not found in the main clause.

Table 6

Group I Normal Children with MAS between 2-11 to 3-9 and
 Group II Normal Children with MAS between 4-6 to 5-4 on
 Percentages of Response to Two Pronoun Deictic
 Sentences with Both the Second and Third
 Person Pronouns, Where Neither Pronoun
 Is Stressed

Refers to the main clause	S_{10}	
	he unstressed ¹	him unstressed ²
<u>Group I</u>		
Subject (PFH)	.20	(FR) .60
Object (FR)	.67	(PFH) .13
Other (AFR)	.13	(AFR) .27
<u>Group II</u>		
Subject (PFH)	.07	(FR) .86
Object (FR)	.80	(PFH) .07
Other (AFR)	.13	(AFR) .07

¹The bear hit the tiger and then he hit him.

²The bear hit the tiger and then he hit him.

Note: PFH denotes parallel function hypothesis; FR denotes functional role reversal and AFR denotes alternative function reference to the other or third unnamed alternative character not found in the main clause.

he (Table 4) in contrast to the adults' clear preference or agreement (100%) and a decided reversal of function (FR) interpretation when HE is stressed where the adults chose a FR pattern in 97% of their responses. In Group I the stressed pronoun HE was interpreted as referring to the object of the main clause on 60% of the responses [i.e., a functional role reversal (FR)]. The same pattern was found in Group II on 80% of the responses (Table 4). Clearly, added stress or emphasis is interpreted by these children as a significant cue for restriction and the older children (Group II) are somewhat closer to the adult pattern than are the younger children. Without stress the pronominal referent pattern for he was not restricted and no clear referent for the pronoun was established.

S₈: The bear hit the tiger and then the lion hit him.

When presented with an unstressed object pronoun him a referent change was noted with age. The younger or Group I children (Table 4) exhibited an unrestricted manner of pronominal reference. The responses were approximately equally divided between PFH (47%) and FR (53%) interpretations. The older Group II children (Table 4) exhibited a consistent restricted pronominal reference pattern (i.e., 93% of the responses displayed FR).

S₉: The lion hit the bear and then he hit him.

When the Group I normal children were presented with two pronoun sentences where one of the two pronouns were stressed, the interpretation of the unstressed pronoun was relatively unrestricted. On both unstressed pronouns, 33% of the responses placed reference on the third

or other unnamed character (AFR) and 47% of the responses for both he and him were FR patterns. In Group II a more restricted pattern of reference is apparent for both unstressed pronouns he and him (Table 5). An unstressed he was chosen on 60% of the responses as referring to the object of the main clause (FR) as compared to 47% of the Group I children's responses. That is, Group I and II children displayed a preference for a FR regardless of position. The unstressed him was interpreted as FR for 47% of the Group I children's responses and 93% of the Group II children's responses. This pattern of reference was not at all similar to the adults, who displayed a pattern of PFH on stressed pronouns and a pattern of alternative functional reference (AFR) outside of the main clause for the stressed pronoun.

When presented with a stressed pronoun HE or HIM Group I children displayed a preference for functional role reversal (FR) on both pronouns in 60% of the responses (Table 5). The same trend of functional role reversal was seen in Group II only now it occurred on 80% of the responses.

S₁₀: The lion hit the tiger and then he hit him.

When presented with two unstressed pronouns in a sentence and neither pronoun stressed, both Groups I and II exhibited a restricted manner of reference (Table 6). The pattern displayed was that of a functional role reversal that occurred on 67% of the responses to he and 60% of the responses to him for Group I. Group II performed similarly with 80% and 86% respectively.

Summary of normal children's pronominal reference patterns. The normal children treated pronominal reference in a restricted manner which changed with age. When presented with a single pronoun sentence the stressed deictic pronoun interpretation showed a trend of functional role reversal (FR) which appeared to develop with age. Recall that Group I displayed a FR pattern on 60% of the stressed HE responses and 80% displayed the same pattern in Group II. The normal children in Groups I and II displayed less preferential patterning of PFH reference (53% of the responses for both groups) when presented with unstressed he, whereas all of the adults responses were according to the PFH.

A similar restricted manner of pronominal reference was exhibited by the normal children when presented with a single unstressed pronoun him. The restricted reference once again took the form of a functional role reversal which increased in relative percentages with age. This pattern of FR appeared in Group I children to show 53% FR preference and Group II showed 93% preference. The pattern displayed by the normal children was different from the adults with regard to the type of restriction. The adults displayed a pattern of PFH while the children favored a FR pattern.

In the two pronoun deictic sentences where one of the two pronouns was stressed the normal children continued to treat the pronouns in a restricted manner. In Group I the unstressed pronouns, both he and him, were usually interpreted as a functional reversal of the main clause characters (i.e., he refers to the object of the main clause and him refers to the subject of the main clause). When the pronouns were

stressed the FR pattern was more definite. In Group II the developmental trend for FR became stronger. That is, now 80% of the stressed pronoun (vs. 60% for Group I) responses followed a FR pattern. The pattern of responses to both unstressed and stressed pronouns in Group II children showed an increase or enhancement of the pattern shown by Group I children. This may be interpreted as an emerging pattern of restriction in interpretation. However, their interpretation of restriction, specifically how the stress restricted interpretation was dissimilar from the adult interpretation.

When presented with sentences containing two unstressed pronouns the normal children continue to use a restricted manner of reference and display a pattern of functional role reversal (FR). This too is different from the adults who treat the pronouns in these sentences as unrestricted. That is, the adults found this an ambiguous situation and displayed no preferential pattern of pronominal reference.

Down Syndrome Children's Pronominal Reference Patterns

The Down Syndrome (DS) Ss were compared both with the adults and the normal (MA matched) children. Two subgroups of DS Ss were formed according to the mental ages as calculated by their PPVT-R score. Group I consisted of five children with MAs from three years zero months to three years six months. Group II consisted of five children with MAs from four years six months to five years nine months (see Table 1, p. 24).

The DS pattern of responses is displayed in Tables 7 through 9.

Table 7

Group I Down Syndrome Children with MAS between 3-1 to 3-6 and
Group II Down Syndrome Children with MAS between 4-6 to 5-9 on
Percentages of Response to One Pronoun Deictic Sentence
for Both Second and Third Person Pronouns

	<u>S₇</u>			<u>S₈</u>	
Refers to the main clause	he unstressed ¹	HE stressed ²		him unstressed ³	
<u>Group I</u>					
Subject (PFH)	.20	.60	(FR)	.33	
Object (FR)	.47	.33	(PFH)	.33	
Error*	.33	.07		.33	
<u>Group II</u>					
Subject (PFH)	.60	.67	(FR)	.33	
Object (FR)	.27	.27	(PFH)	.60	
Error*	.13	.07		.07	

¹The lion hit the bear and then he hit the tiger.

²The lion hit the bear and then HE hit the tiger.

³The bear hit the tiger and then the lion hit him.

*Error indicates that a S replaced the pronoun with a third (unnamed) character not found in the main clause and ignored the named object found in the subordinate clause. PFH denotes parallel function hypothesis and FR denotes functional role reversal.

Table 8

Group I Down Syndrome Children with MAs between 3-0 to 3-6 and
 Group II Down Syndrome Children with MAs between 4-6 to 5-9 on
 Percentages of Response to Two Pronoun Deictic Sentences
 for Both Second and Third Person Pronouns Where One
 of the Two Pronouns Was Stressed

Refers to the main clause	S ₉			
	he unstressed ¹	HE stressed ²	him unstressed ³	HIM stressed ⁴
<u>Group I</u>				
Subject (PFH)	.40	.47	(FR)	.13
Object (FR)	.40	.33	(PFH)	.27
Other* (AFR)	.20	.20	(AFR)	.60
<u>Group II</u>				
Subject (PFH)	.20	.40	(FR)	.60
Object (FR)	.73	.53	(PFH)	.20
Other* (AFR)	.07	.07	(AFR)	.20

¹The lion hit the tiger and then he hit HIM.

²The tiger hit the lion and then HE hit him.

³The lion hit the tiger and then he hit HIM.

⁴The tiger hit the lion and then he hit HIM.

Note: PFH denotes parallel function hypothesis; FR denotes functional role reversal and AFR denotes alternative function reference to the other or third unnamed alternative character not found in the main clause.

Table 9

Group I Down Syndrome Children with MAS between 3-0 to 3-6 and
 Group II Down Syndrome Children with MAS between 4-6 to 5-9
 on the Percentages of Response to Two Pronoun Sentences
 with Both the Second and Third Person Pronouns Where
 Neither Pronoun Is Stressed

Refers to the main clause	S_{10}	
	he unstressed ¹	him unstressed ²
<u>Group I</u>		
Subject (PFH)	.60	(FR) .40
Object (FR)	.27	(PFH) .47
Other* (AFR)	.13	(AFR) .13
<u>Group II</u>		
Subject (PFH)	.20	(FR) .67
Object (FR)	.47	(PFH) .27
Other (AFR)	.33	(AFR) .07

¹The bear hit the tiger and then he hit him.

²The bear hit the tiger and then he hit him.

Note: PFH denotes parallel function hypothesis; FR denotes functional role reversal and AFR denotes alternative function reference to the other or third unnamed alternative character not found in the main clause.

S₇: The lion hit the bear and then he hit the tiger.

The younger Group I DS children treated the unstressed or normally intoned pronouns, both subject and object, in a relatively unrestricted manner of pronominal reference. That is, they displayed no clear pattern of interpretation (Table 7). In approximately one third (33%) of the unstressed he and unstressed him responses the DS children made an error. That is, they displayed a reference pattern whereby a substitution occurred. For example, when the "tiger" was already found in the subordinate clause but was chosen as the referent for the pronoun he. Therefore, on that trial the named object found in the subordinate clause (tiger) was ignored and replaced by either one of the other of the two main clause characters (lion or bear). Some of the normal children's responses did display the same error pattern but not to the extent as demonstrated by the DS children.

The older Group II DS children treated these single pronoun sentences with a restricted manner of reference. They preferred a pattern of parallel function hypothesis (PFH) and did so on both unstressed and stressed pronouns (Table 7). Only 13% and 7% of these older DS children displayed the error pattern for he and him respectively, seen in Group I DS children. These patterns are different both from those of the adults or from that of the normal children. The adults displayed a pattern of PFH only on the unstressed responses (see Table 2, p. 28) and the normal children displayed a pattern of functional role reversal (FR), but only on the stressed pronouns (see Table 4, p. 33).

When the DS children of Group I were presented with a stressed pronoun HE (Table 7), a restricted trend was apparent. In approximately two thirds (60%) of these responses the restriction was identified as the PFH pattern. That is, HE was chosen as referring to the subject of the main clause, in this case the lion. This same restriction was evident in the older Group II DS children (Table 7) with little change in magnitude (67%). Both the normal children and the adults displayed a pattern of functional role reversal (FR) when presented with a stressed pronoun in this context (see Table 2, p. 28, and Table 4, p. 33).

S₈: The bear hit the tiger and then the lion hit him.

When the DS children of Group I were presented with the unstressed pronoun him the pattern of pronominal reference was in an unrestricted manner. That is, the DS children in Group I were evenly split in their pronominal referents (Table 7). The older, Group II, DS children treated the pronoun him in a more restricted manner and displayed a preference (60%) for PFH pattern. This pattern displayed by the older DS children was similar to that of the adults who chose the pattern of PFH on 62% of the responses (see Table 2). However, the restriction pattern was different from that of the MA matched children who chose a functional role reversal (FR) pattern on these same unstressed pronouns (see Table 4).

S₉: The lion hit the bear and then he hit him.

When the DS children of Group I were presented with these two pronoun sentences in which one of the two pronouns was stressed, the pronouns were treated in an unrestricted manner. That is, pronominal

reference followed no clear preference (Table 8). Group I displayed no strong trend of reference for either stressed or unstressed he forms, but some preference was noted for the referent of him. However, in Group II a restriction in reference became apparent. That is, in 73% of the responses the older DS children displayed a pattern of functional role reversal (FR) for he and 53% FR for HE (Table 8). This pattern of restriction is different from the adults who consistently displayed a pattern of PFH for the unstressed pronoun and FR for the stressed pronoun (see Table 3, p. 29).

When the DS children of Group I were presented with an unstressed pronoun him the pattern of responses was somewhat restricted (Table 8). That is, the preferred pronoun referent was according to the PFH pattern in just over half (53%) of the responses. A more pronounced pronominal restriction was exhibited on the stressed pronoun HIM. However, now the pattern of restriction was different. In 60% of the responses to stressed object pronouns Group I DS children displayed an awareness that stress was a cue for them to change their usual interpretation. That is, they interpreted HIM as referring to the unnamed or third character not found in the main clause (Table 8).

When the older DS children of Group II were presented with an unstressed him the manner of interpretation showed no clear preference (47% FR). More of the DS children of Group II treated the stressed pronoun HIM in a restricted manner, that is 60% agreed on the functional role reversal (FR) pattern (Table 8). The restricted manner of pronominal reference exhibited by Group II DS children was similar to the

pattern displayed by the normal mentally matched children (see Table 5, p. 34).

S₁₀: The lion hit the tiger and then he hit him.

When presented with two unstressed pronouns the DS children of Group I interpreted the pronouns as if they were restricted. When presented with an unstressed he the DS children displayed a pattern of PFH on 60% of the responses (Table 9). When presented with an unstressed him their interpretations were in lesser agreement of pronominal reference (49% PFH).

When the DS children of Group II were presented with an unstressed he the interpretation showed some preference (47%) towards functional role reversal (Table 9) and for unstressed him, their interpretative preference was again for functional role reversal (67%). In other words, Group I DS children show a contrasting pattern to MA matched normal children, but Group II DS children show a pattern of responses that was similar to the normals.

Summary of Down Syndrome children's pattern of pronominalization.

The DS children of Group I exhibited a generally unrestricted pattern of reference for both unstressed pronouns he and him in the one pronoun deictic sentences. This was not the case in the Group II DS children, who displayed a restricted pattern of PFH on 60% of their responses to the unstressed pronouns. On the stressed pronoun HE DS Ss exhibited a restricted manner of reference which took the form of the PFH for both Groups I and II (Table 7, p. 40).

Group I DS children treated the unstressed pronoun him in an unrestricted manner. However, with increased age (Group II) the DS children changed and exhibited a restricted manner of pronominal reference. The pattern took the form of PFH.

Of particular importance was the high percentage of errors (33% or 5 out of 15 responses) that Group I DS children displayed on the unstressed pronouns. These errors were present in the normal children data but not in as high a percentage (e.g., the highest was 13% displayed on the pronoun HE of Group I data; see Table 4, p. 33). Clearly the addition of stress or emphasis provided these DS children with a cue as to choice of referent in these sentences, but their interpretation of what stress meant as a cue is clearly in error in a significant number of cases.

Both the DS and the normal children treated the pronoun in the one pronoun sentences as restricted. However, the normal children displayed a pattern of FR on the stressed pronoun HE whereas the DS children displayed a pattern of PFH (see Table 4 and Table 7, p. 40). The DS children also differed from the normals in the restriction of the unstressed pronoun he. Whereas the DS children with increased age displayed a restriction characterized by PFH pattern the normal children displayed little change between age groups and remained unrestricted for these sentence types.

When presented with a two pronoun deictic sentence where one of the two pronouns was stressed, the DS children demonstrated a manner of pronominal reference which was apparently in a state of transition.

Generally Group I treated the pronoun HE in an unrestricted manner. That is, no preference was displayed for any pattern of restriction (PFH, FR, AFR). Stress or emphasis on these sentences had little effect (see Table 8, p. 41). This was not the same for the pronoun him. The Group I DS children displayed a restriction pattern that was different for unstressed and stressed responses. On unstressed him a pattern of PFH was displayed. On a stressed HIM a pattern of AFR was displayed.

Therefore it appears that even though the DS children of Group I are developing a pronominal reference pattern, it is not the same pattern as the normal MA matched children displayed. That is, the normal MA matched children generally displayed a trend of unrestricted to restricted and from PFH to FR and/or AFR.

The trends noted in Group I DS children were different from that of Group II. Now, the beginnings of a restricted manner of pronominal reference were displayed. In 73% of the responses to the unstressed pronoun he a FR occurred. Little restriction was yet present in the stressed pronoun he responses, or in the unstressed him responses. Yet, 60% of the responses exhibit restriction in the form of FR on a stressed pronoun HIM. The manner of restriction exhibited by the DS children of Group II seemed to lack consistency in terms of their reaction to the cue of stress. The Group II DS children showed responses similar to the Group I normals especially in the two pronoun sentences where one of the pronouns was stressed.

In the two pronoun sentences the DS children exhibited a restricted manner of pronominal reference for one but not both of the pronouns when

neither of the two pronouns was stressed. In Group I he was chosen as referring to the subject of the main clause (PFH) on 60% of the responses. No preference was displayed for the pronoun him (see Table 9, p. 42). In Group II little preference was displayed for he but unstressed him responses displayed a pattern of FR for 67%.

Summary of Results

In answer to the first experimental question concerning the functional understanding of pronouns, the DS children in Groups I and II understood as many pronouns as did the normal MA matched children in Groups I and II when tested by the VCS. This was indicated on Table 1 (p. 24) and statistically validated by a t test [$t(4)$ 1.70, $p \leq .2$ for Group I and $t(4)$.589, $p \leq .6$ for Group II children].

The other experimental questions had to do with functional interpretations of pronoun referents in deictic sentence environments and the effects of stress on their interpretation. The pronominalization patterns of the experimental children on deictic sentences were individualized in some aspects, and developmentally similar in manner and pattern of pronominalization between groups on a few aspects. However, it would be difficult to place all the individual trends noted previously into one single schema.

Throughout the data two aspects of pronominalization have been noted. The concepts of unrestricted/restricted manner of pronominal reference and the effects of stress or emphasis on a pronoun when placed within deictic sentences. Both of these concepts were delineated

previously as a means to describe the data from a within-groups standpoint. What follows is a between-groups description of the trends of pronominalization.

The previous discussion of the results has made it clear that the effects of pronoun function (subject vs. object) and stress have not been consistent across groups nor across stimulus sentence situations. Three types of experimental situations are represented among the stimulus sentences. The first situation employed either the he or the him pronoun in the sentence, but only the he was contrasted with stress. In the second situation, both the subject and the object function pronouns were represented in the same sentence and one of the two was stressed. In other words, in that sentence frame both the subject vs. object and the stress vs. unstressed comparisons could be made. In the third sentence type two pronouns occurred but both were unstressed. It is apparent that there were some general patterns of unrestricted/restricted referent running through these three circumstances, but also that the particular circumstances or sentence frame were critical to any generalized interpretation which could be made. Therefore, for the sake of answering the specific experimental questions that were posed within this study relative to the effects of pronoun function and contrastive stress, the data from the second sentence frame (two pronouns with one of the two stressed as in S₉: The lion hit the tiger and then HE hit him) will be used to derive the answers.

In order to compare the between-group trends certain variables were selected as representative of the total concept of pronominalization.

One of these aspects was the interpretation of the parallel function hypothesis.

The restricting Parallel Function Hypothesis (PFH) was selected as a pronoun pattern to be displayed for two reasons. First, a number of researchers (Maratsos, 1973; Bates, 1976; Grober, 1978; Solan, 1980) propose that this pattern of pronominalization is one of the earliest to develop in children. Secondly, due to the nature of the design the patterns of pronoun reference were reciprocal numbers and thus it is important to show all the possible choices (i.e., functional role reversal FR, and alternative functional reference AFR) as an indication of the direction or pattern of the restriction. The two pronoun sentences were selected because they provide an easy way to separate the pronominal reference trends and also create a relative hierarchy of pronoun difficulty.

Profiles of the Subject Function Pronoun He Placed in a Two Pronoun Deictic Sentence

In Figure 1 the adults displayed a clear preference for PFH pattern of pronominal restriction on the unstressed pronoun he when in a two pronoun deictic sentence. Note that only the Group II (older) normal children displayed a profile similar to the adults. The DS children both Group I and II displayed the opposite profile. That is, the DS children in both groups displayed a larger percentage of responses following the PFH on the stressed pronouns rather than on the unstressed pronouns.

A number of patterns can be seen in these data:

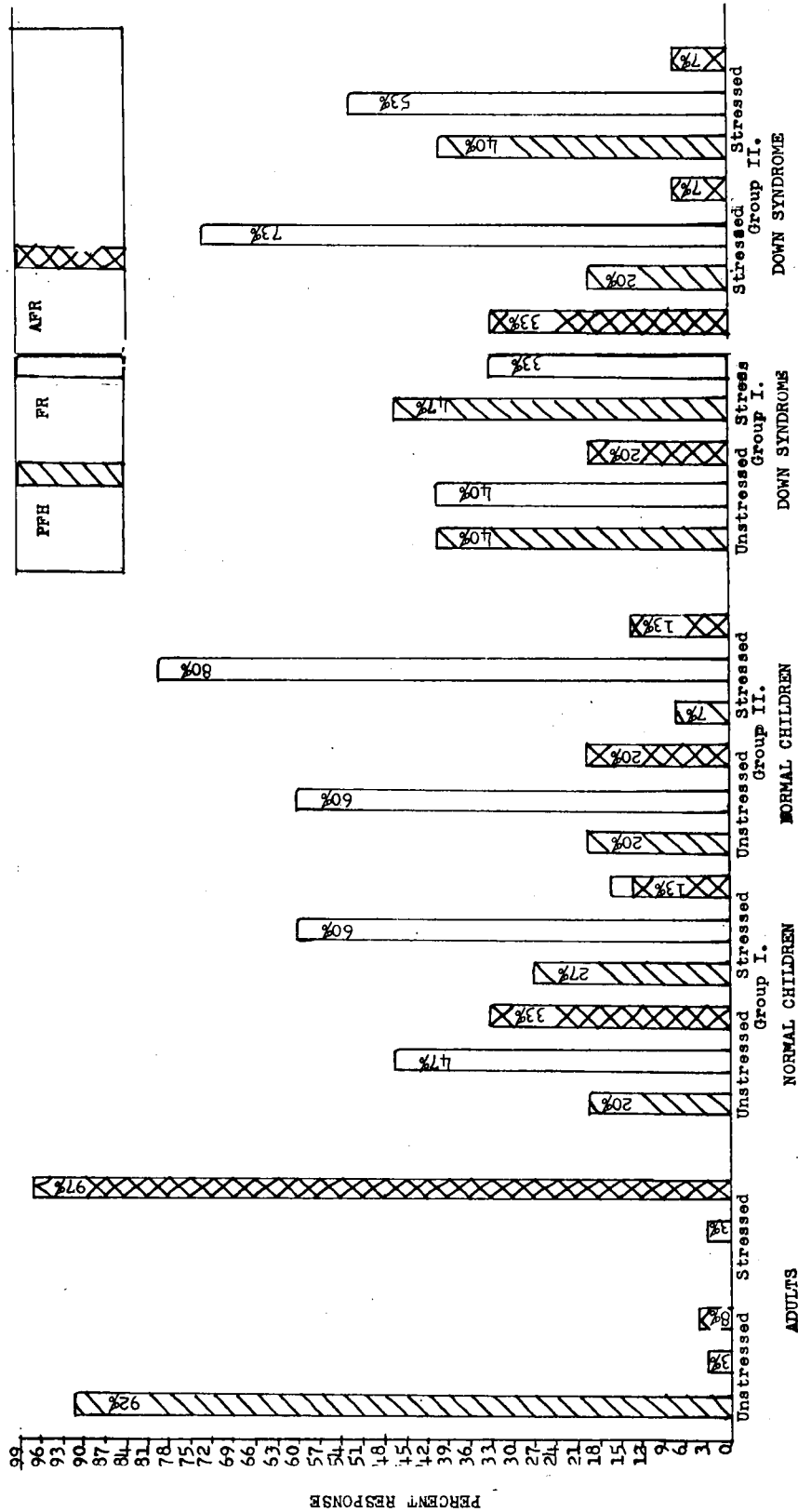


Figure 1. Percentages of response by adults, normal (Groups I and II) children, Down Syndrome (Group I and II) children to the two pronoun deictic sentences charting only the unstressed and stressed pronoun he. PFH denotes parallel function hypothesis; FR denotes functional reference; AFR denotes alternative functional reference.

1. Only normal Group II children displayed a profile in the same direction as the adults (i.e., larger percentages of responses followed PFH pattern on an unstressed he than on a stressed HE).
2. Both normal and DS children of Group I displayed more preference for using PFH restriction patterns on stressed pronouns than on unstressed pronouns, indicating that at early ages the cue of stress indicates to the child to use a strategy and they only seem to know PFH.
3. In both normal and DS children a change in pattern of pronominalization was noted. Although this change was not the same in the two subject populations, age did allow the children to note differences and display different strategies. The DS children's restriction pattern (PFH) remained the same but, with age the magnitude of the relative percentages increased. The normal children changed their interpretation of stress. That is, Group I displayed a restricted pattern of PFH but only on the stressed pronouns. In Group II they reversed themselves and applied the adult's strategy of using PFH on the unstressed pronouns and a different restriction on the stressed pronouns.
4. When the pronoun he was placed in a subject position of a subordinate clause the DS children displayed a different profile of pronominalization when differential stress was applied to the deictic sentence.

Question 2. Do Down Syndrome (nondisjunction type) children differ from mentally matched normal children in their understanding of the experimental coreferenced (deictic) pronoun sentences when:

- (a) The pronoun is in the subject position of a subordinate clause is alternatively unstressed or stressed.

The Down Syndrome children when compared to the normal MA matched children displayed a different manner of pronominal restriction. The DS children when presented with a stressed or emphasized subject pronoun HE displayed a pattern of PFH most often while the normal MA matched children did not when presented with the same stressed pronoun in a two pronoun sentence.

Profiles of the Object Function Pronoun Him
Placed in a Two Pronoun Deictic Sentence

In Figure 2 all groups are displayed and the bar graph profiles denote unstressed and stressed responses on the pronoun him in a two pronoun deictic sentence where only one of the pronouns was stressed at a time. The adults continued to display a strong trend to follow the restricted pattern of PFH on the unstressed pronoun him in a two pronoun deictic sentence.

Both DS Groups I and II displayed a profile that was similar to that of the adults (i.e., larger percentages of unstressed pronouns displayed PFH than on the stressed pronoun). The normal children displayed a restricted pattern of pronominal reference; however, the profile was in the opposite direction from the DS children and the adults. In Group II the trend seemed to get stronger (i.e., larger

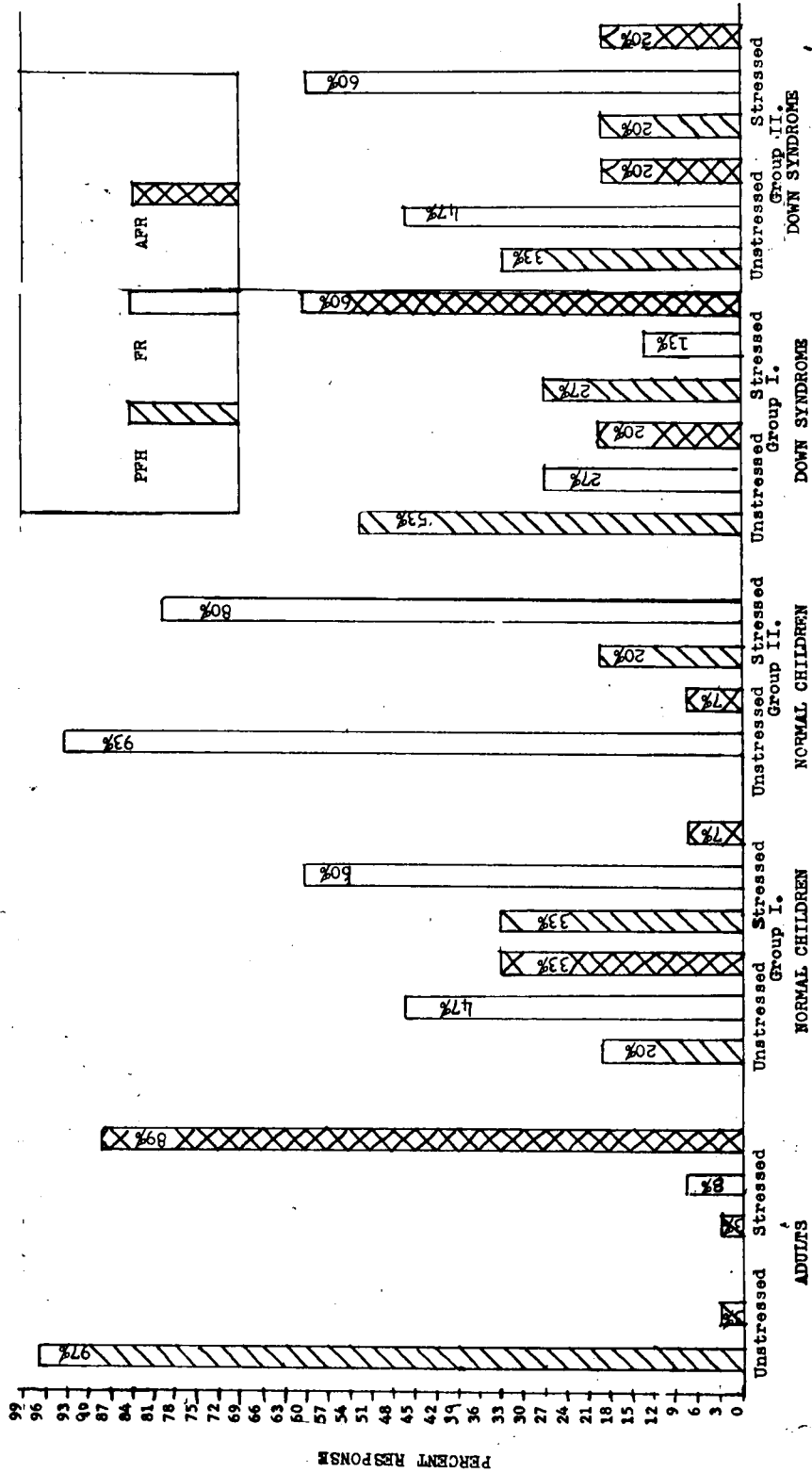


Figure 2. Percentages of response by adults, normal (Group I and II) children, Down Syndrome (Group I and II) children to the two pronoun deictic sentences charting only the unstressed and stressed pronoun him. PFH denotes parallel function hypothesis; FR denotes functional role reversal; and AFR denotes alternative functional reference.

differences were present between the unstressed and stressed pronoun responses).

The data displayed a number of apparent trends:

1. Both groups of DS children displayed a profile similar to the adults.
2. The normal children of both groups displayed a profile in the opposite direction of the DS and adults
3. Stress in all groups provided a differentiating semantic cue.
4. When the pronoun him is placed in the object position of a subordinate clause of a deictic sentence with two pronouns and stress is applied differentially DS children displayed a different profile of pronominalization than did the normal MA matched children.

Question 2. Do Down Syndrome (nondisjunction type) children differ from mentally matched normal children in their understanding of experimental coreferenced (deictic) pronoun sentences when:

- (b) The pronoun is in the object position of a subordinate clause is alternatively unstressed or stressed.

The Down Syndrome children when compared to the normal MA matched children displayed a different manner of pronominal restriction. The DS children when presented with an unstressed him displayed a pattern of PFH more often than did the normal MA matched children when presented with the same sentence type.

Summary of Experimental Questions

1. Do the Down Syndrome (nondisjunction type) children differ from the normal MA matched children in the number of correct pronouns identified when tested by the Vocabulary Comprehension Scale.

In this study no significant differences were found [$t(4) = 1.70$, $p \leq .2$ for Group I and $t(4) = .589$, $p \leq .6$ for Group II] between Down Syndrome and normal MA matched children in the number of correct interpretations when tested by the Vocabulary Comprehension Scale. Therefore it can be concluded that any differences that resulted in the experimental deictic sentences was not related to lack of knowledge of the meaning of the pronoun (i.e., the experimental Ss had equal knowledge of the meaning of the pronouns used in the sentences).

2. Do Down Syndrome (nondisjunction type) children differ from mentally matched normal children in their understanding of experimental coreferenced (deictic) pronoun sentences when:

- (a) The pronoun is in the subject position of a subordinate clause is alternatively unstressed or stressed.

The DS Ss differed from the normal MA matched Ss when a subject pronoun (he) was placed in a deictic sentence and stress was applied. Recall that the normals displayed a restricted FR pattern of reference on the stressed pronoun responses and the DS children displayed an unrestricted pattern on the same stressed pronouns when placed in the subject position of a subordinate clause.

- (b) A pronoun in the object position of a subordinate clause is alternatively unstressed or stressed.

The DS Ss differed from the normal MA matched Ss when an object pronoun (him) was placed in a deictic sentence and stress was applied. Recall that the normal children displayed an unrestricted manner of pronominalization in Group I and then changed to a restricted manner to display a pattern of FR in Group II. The DS Ss displayed a restricted manner of pronominal reference and displayed a pattern of AFR in Group I and changed to display a restricted pattern of FR in Group II.

Discussion

The data resulting from this investigation explored numerous characteristics of pronominalization in Down Syndrome (DS) and normal children. Certain aspects key to the answering of the research questions were singled out in order to expedite a proper answer to these questions. Throughout this project three topic areas: pronominal referent pattern, unrestricted and restricted manner of pronominalization, and the effects of stress applied to a deictic pronoun context, were constantly used to compare Down Syndrome nondisjunction type children to normal children of matched mental age. These topics will be utilized to demonstrate the implications of the data generated as result of this study.

The data displayed on Table 1 (p. 24) made it clear that at least for the Ss tested in this project, there was little or no difference in the number of pronouns correctly identified by the two subject groups when tested by the Vocabulary Comprehension Scale (VCS).

However, as seen in the deictic pronoun sentence task referent distinctions were not always treated in the same manner by various subject groups. The context provided each S with information, but what the S did with this information acquired was different depending on the individual S's age interpretation of stress.

The results of the children's responses to the differentially stressed coreferenced (deictic) pronouns placed in sentence environments was rather individualized. However, some important distinctions are possible.

The experimental sentences were by nature ambiguous. That is, when a pronoun is placed in a coreferenced position it could logically refer to more than one noun. This is why Miller (1981) contends that ambiguity is multileveled and that different levels of information processing occur (in this case processing of pronominal reference). It is logical to suggest that in order to resolve the ambiguity of the deictic sentences adults and children's interpretation of deictic pronouns was dependent on the strategy employed (i.e., Parallel Function Hypothesis, Functional Role Reversal, or Alternative Reference Function) and by the context or situation. However, context may not always provide enough information when Ss were asked to determine reference for these pronouns.

Chomsky (1973) delineates pronominal reference patterns as proceeding from an unrestricted manner (stage I), to a restricted manner (stage II) and then finally the notation that both are possible or what is called restricted/unrestricted (stage III).

The scheme outlined above was evident in the data results from this study. Note that adults (see Table 3, p. 29) which were assumed to have developed all language pronominal skills were very consistent in the way they applied the specific restrictions of PFH, FR, or AFR in one pronoun sentences or in two pronoun where one of the pronouns was stressed. When confronted with a situation where there were not sufficient cues to resolve the ambiguity (e.g., "The lion hit the bear and then he hit him" where no stress was provided on either pronoun) the adults' interpretation was less restricted. This indicates that the context alone in some instances (i.e., S_{10}) did not provide the adults with enough information. The only difference in sentences like S_{10} and S_9 was the factor of stress. In S_9 two pronouns were also present but one of the pronouns was presented with stress or emphasis.

The relative ambiguity of a referent choice displayed in S_{10} indicated that without the supra-segmental aspect of stress semantic referent interpretation and therefore semantic understanding was not possible given only the information provided by the context.

Therefore two statements can be made as to the relationship of context and pronominalization:

1. In a situation where a deictic pronoun is presented without the supra-segmental cue of stress adults can not solve the ambiguity; thus stress is a factor in pronominal reference patterning.
2. The interpretation of stress by the adults was contingent upon the situation in which stress was presented, either stress on

the subject position of a clause or an object position of a clause.

It was evident from the data that context-specific stress was important for solving the ambiguity of deictic pronoun sentences for Down Syndrome (DS) and normal children in determination of a referent. Both DS and normal children displayed a reaction to a stressed pronoun which was often different from the response made to an unstressed pronoun within the same context. However, although the children of both groups treated the cue of stress as being context-specific the children often displayed a unique interpretation of this disambiguating semantic cue. This unique interpretation of these pronouns was for the children based on a number of factors: age, stage of pronominal restriction, S type, and context.

Recall Chomsky's (1973) stages of pronominal restriction which proceed from stage I unrestricted to stage II restricted finally to stage III restricted/unrestricted. This sequence was helpful in classifying children's developmental pronominal growth; however, some important differences emerged.

Chomsky (1973) stated that the change from unrestricted to restricted occurred by age five or six years. Although the children of both groups displayed some restricted pattern of pronominal reference the degree of restriction was obviously dependent on context (see Table 4, p. 33, and Table 7, p. 40). In the context of a one pronoun deictic sentence the DS children displayed a pattern of PFH while the normal children displayed a pattern of FR. Therefore, within the

context of a single stressed pronoun HE, what could be described as a qualitatively different interpretation of stress resulted in a semantically different understanding of the pronoun by the two subject groups. Clearly both groups understood the pronoun and interpreted the context and stress, but in a semantically different way.

The inconsistencies displayed in the interpretation of stress were related to the ages of the Ss and the stage of development of restriction. In terms of stage of restriction, the data in this study indicated that the DS children are generally not as linguistically mature as the normal children. That is, DS children often did not display a restricted manner of pronominal reference as early as did the normal mentally matched children (see Table 5, p. 34, and Table 8, p. 41). Since the child's definition of stress was contingent upon context-specific interpretation this allowed that child to utilize his/her own system of rule interpretation. If the child had a rule for stress, then it was applied primarily within the context of a deictic pronoun sentence where one of the two pronouns was stressed.

CHAPTER V

SUMMARY AND CONCLUSIONS

Summary

The purpose of this study was to examine the patterns of pronominalization skills of Down Syndrome (nondisjunction type) children and normal children when presented a differentially stressed deictic pronoun placed in various positions of a sentence.

Twenty Ss, ten genetically confirmed Down Syndrome (DS) and ten normal mentally matched children demonstrated comprehension of pronouns as tested by the Vocabulary Comprehension Scale and then eighteen deictic pronoun sentences presented live-voice.

The data in this study were the percentages of referent interpretations for the pronouns in the stimulus sentences. The data were analyzed to provide an evaluation of the number of pronouns correctly identified by DS and normal children when tested by the Vocabulary Comprehension Scale, to compare the patterns of pronominalization of DS and normal children when (1) the pronoun in the subject position of a subordinate clause was stressed or unstressed, and (2) the pronoun in the object position of a subordinate clause was stressed or unstressed. The results are as follows:

1. There were no significant differences between the DS and normal children in age groups I and II in their understanding of pronouns when tested by the Vocabulary Comprehension Scale.

2. When responses of the two groups were compared on a stressed pronoun placed in the subject position of a subordinate clause the DS children displayed a pattern of PFH more often than did the normals.
3. When the DS children were compared to the normal MA matched children on a stressed pronoun placed in the object position of a subordinate clause the DS children displayed less change from their unstressed pronominal pattern than did the normal children.

Conclusions

On the basis of this study, the following conclusions can tentatively be made:

1. DS and normal children in this study when matched by receptive vocabulary MAs have essentially equal understanding of pronouns as tested by the Vocabulary Comprehension Scale.
2. The interpretations of deictic pronouns vary as a function of age and subject type (DS or normal) even when matched by receptive vocabulary MAs.
3. Children before the age of five years demonstrated a relatively restricted manner of pronominalization when presented with a stressed pronoun.
4. Stress provides a disambiguating semantic cue that is context specific in its interpretation of a pronoun referent.

5. Down Syndrome (nondisjunction type) displayed a qualitatively different interpretation of context specific stress from the normal children.
6. Down Syndrome (nondisjunction type) displayed a less linguistically mature pattern of pronominal restriction compared to mentally matched normal children.

Limitations of the Study

This study was limited in the following ways:

1. The sample of subjects in each group was small.
2. The age range of subjects used for this study was limited and therefore the lower and upper bounds of performance was not obtained.
3. An extra prototype sentence was needed to adequately test the function of stress on a pronoun in the object position of a one pronoun sentence.
4. Stimulus sentences were presented live-voice and even though test-retest reliability was high and Vu meter readings were consistent some variation could have affected the outcome.

Suggestions for Further Study

1. Since the age range was too restricted to adequately examine the development of restriction, it is suggested that the same design be used with younger and older normal children to fully validate the pattern of restriction in the normal children.

2. Since this study indicates that stress is an important cue in recognizing pronominal reference, a form of intervention utilizing the child's ability to attend to a stressed word within a given context is suggested. By stressing or emphasizing the desired word and then moving the stress to different parts of a sentence or phrase children could better attend to the desired task. Stressing would be useful for normal or Down Syndrome (nondisjunction type).
3. It was possible that some of the Ss had poor short-term memory skills and this could have influenced the S's ability to perform the task, thus in a further study this needs to be controlled.
4. The receptive vocabulary ages of two DS children in Group I were atypically high (e.g., CAs of 3-6 and 3-8 with MAs of 3-0). A posthoc analysis of the data revealed no identifiable trend of pronominalization which separated these two Ss from the other three Ss of Group I. Their receptive age (MAs) scores were atypical for DS children, yet displayed no contrary pattern of pronominalization from the rest of their group when matched by receptive vocabulary age. A further study should strive to gain more stringent matching criteria to help ensure S uniformity.

BIBLIOGRAPHY

BIBLIOGRAPHY

- Adler, S. The influence of genetic syndromes upon oral communication skills. (Letter to the editor). Journal of Speech and Hearing Disorders, 1976, 41, 133-138.
- Asp, C. The verbo-tonal method for establishing spoken language and listening skills. In L. Perkins (Ed.), Hearing disorders. New York: Academic Press, 1984.
- Bates, E. Pragmatics and sociolinguistics in child language. In D. Morehead and A. Morehead (Eds.), Normal and deficient child language. Baltimore: University Press, 1976.
- Bates, E. Acquisition of pragmatic competence. Journal of Child Language, 1975, 1, 277-281.
- Bellugi, U. Simplifications in children's language. In R. Huxley & E. Ingram (Eds.), Language acquisition: models and methods. New York: Academic Press, 1971.
- Bloom, L., & Lahey, M. Language development and language disorders. New York: John Wiley and Sons, 1978.
- Bloom, L. One word at a time. The Hague: Mouton, 1973.
- Brown, R. Development of the first language in the human species. American Psycholinguistics, 1973, 97-106.
- Brown, R. A first language: the early stages. Harvard: University Press, 1972.
- Byrne, M. C. Speech and language development of athetoid and spastic children. Journal of Speech and Hearing Disorders, 1959, 24, 166-178.
- Carey, S. The child as a word learner. In M. Halle, J. Bresnan & G. A. Miller (Eds.), Linguistic theory and psychological reality. Cambridge, Mass.: MIT, 1978.
- Chiat, S. Context specificity and generalizations in the acquisition of pronominal distinctions. Journal of Child Language, 1981, 8, 75-91.
- Chomsky, C. The acquisition of syntax in children from 5 to 10. Cambridge, Mass.: MIT, 1973.
- Clark, E. V. From gesture to word: on the natural history of deixis in language acquisition. In J. S. Bruner & A. Garton (Eds.), Human growth and development. Oxford: Oup, Wolfson College Lectures, 1977.

- Coggens, T. E. Relational meaning encoded in the two-word utterances of stage 1 Down syndrom children. Journal of Speech and Hearing Research, 1979, 22, 166-178.
- Council on Professional Standards, Committee on Language. Annual report, American Speech Language Hearing Association, June 1983, p. 44.
- Cromer, R. F. The learning of linguistic structure by educationally subnormal children. American Journal of Mental Deficiency, 1972, 77, 346-353.
- Cruttenden, A. The acquisition of personal pronouns and language simplification. Journal of Child Language, 1977, 4, 191-195.
- Das, J. P. Patterns of cognitive ability in nonretarded and retarded children. American Journal of Mental Deficiency, 1976, 77, 6-12.
- Dewart, M. H. Cognitive processing of the mentally retarded child. Journal of Child Language, 1981, 8, 224-238.
- Dewart, M. H. Language comprehension processes of mentally retarded children. American Journal of Mental Deficiency, 1979, 84, 177-183.
- Deutsch, W., & Pechmann, T. Ihr, dir or mir? on the acquisition of pronouns in German children. Cognition, 1978, 6, 155-168.
- Dodd, B. J. Comparison of babbling patterns in normal and Down's Syndrome infants. Journal of Mental Deficiency Research, 1972, 16, 35-40.
- Grober, E. H., Beardsley, W., & Caramazza, A. Parallel function strategy in pronoun assignment. Cognition, 1978, 6, 117-133.
- Halliday, M. A. K. Learning how to mean. In E. H. Lenneberg & E. Lenneberg (Eds.), Foundations of language development: a multi-disciplinary approach (Vol. 1). New York: Academic Press, 1975.
- Hatch, B. Children's use of the objective case pronouns. Journal of Pediatrics, 1969, 23, 392-399.
- Hornby, P., & Huss, W. Use of contrastive stress by preschool children. Journal of Speech and Hearing Research, 1979, 13, 395-399.
- Huxley, R. The development of the correct use of subject pronouns in two children. In G. B. Flores D'Areus & W. J. M. Levelt (Eds.), Advances in psycholinguistics. Amsterdam: North-Holland, 1970.
- Inhelder, B. The diagnosis of reasoning in the mentally retarded. New York: Chandler, 1968.

- Kaper, W. Pronominal case-errors. Journal of Child Language, 1976, 3, 439-441.
- Lacker, J. R. A developmental study of language behavior in retarded children. Neuropsychologia, 1968, 6, 301-320.
- Lenneberg, E. H., Nichols, I. A., & Rosenberger, E. F. Primitive stages of language development in mongolism. In D. M. Rioch & E. A. Weinstein (Eds.), Proceedings of the association for research in nervous and mental disease. Baltimore: Williams and Wilkins, 1964.
- Leonard, L. B., Steckol, K. F., & Panther, K. M. Returning meaning to semantic relations: some clinical implications. Journal of Speech and Hearing Disorders, 1983, 48(1), 25-36.
- Leonard, L. B. Language impairment in children. Merrill-Palmer Quarterly, 1979, 25(3), 205-232.
- Leonard, L. B., Wilcox, M. J., Fulner, K. C., & Davis, G. A. Understanding indirect requests: an investigation of children's comprehension of pragmatic meanings. Journal of Speech and Hearing Research, 1978, 21, 528-537.
- Lieberman, P. Intonation, perception and language. Cambridge: MIT Press, 1967.
- Lucas, E. L. Semantic and pragmatic language disorders: assessment and remediation. Rockville, Md.: Aspen Systems Corp., 1980.
- Maratsos, M. P. How to get from words to sentences. In D. Aaronson & R. Rieber (Eds.), Psycholinguistic research: implications and applications. Hillsdale, N.J.: Erlbaum, 1979.
- Maratsos, M. P. The effects of stress on the understanding of pronominal co-reference in children. Journal of Psycholinguistic Research, 1973, 2, 1-13.
- Miller, L. Pragmatics and early childhood language disorders: communicative interactions in a half-hour sample. Journal of Speech and Hearing Disorders, 1978, XLIII, 419-436.
- Millgram, N. A. Cognition and language in mental retardation. (Letter to the editor). American Journal of Mental Deficiency, 1971, 71, 33-41.
- McDade, H. L., & Adler, S. Down Syndrome and short term memory impairment: a storage or retrieval deficit? American Journal of Mental Deficiency, 1980, 84(6), 561-567.

- Newfield, M. U., & Schlanger, B. B. The acquisition of English morphology by normal and educable mentally retarded children. Journal of Speech and Hearing Research, 1968, 11, 693-706.
- Piaget, J. Play, dreams and imitations in childhood. New York: Norton, 1962.
- Semmel, M. I., & Bennett, S. W. Effects of linguistic structure and delay on memory span of EMR children. American Journal of Mental Deficiency, 1970, 74, 674-680.
- Sheldon, A. The role of parallel function in the acquisition of relative clause in English. Journal of Verbal Learning and Verbal Behavior, 1974, 13, 272-281.
- Smith, B. L., & Oller, D. K. A comparative study of premeaningful vocalizations produced by normally developing and Down's Syndrome infants. Journal of Speech and Hearing Disorders, 1981, 46, 45-51.
- Smith, B. L. Phonological development in Down's Syndrome children. Paper presented at a symposium of the American Psychological Society, San Francisco, 1977.
- Smith, D. W., & Wilson, A. A. The child with Down's Syndrome. Philadelphia: W. B. Saunders Co., 1973.
- Solan, L. Contrastive stress and children's interpretation of pronouns. Journal of Speech and Hearing Research, 1980, 23, 688-698.
- Stoel-Gamman, C. Speech development of infants and children with Down Syndrome. In J. K. Darby (Ed.), Speech evaluation in medicine. New York: Grune & Stratton, Inc., 1982.
- Stoel-Gamman, C. Phonological analysis of four Down's Syndrome children. Applied Psycholinguistics, 1980, 1, 31-48.
- Tanz, C. Cognitive principles underlying children's errors in pronominal case-marking. Journal of Child Language, 1974, 1, 177-183.
- Wheldale, K., & Swann, W. The effects of intonational emphasis on sentence comprehension in severely subnormal and normal children. Journal of Child Language, 1976, 4, 274-292.

APPENDICES

APPENDIX A

LIST OF COMMANDS USED TO ELICIT RESPONSES FOR THE VOCABULARY
COMPREHENSION SCALE (VCS), AND THE MATERIALS
USED IN CONJUNCTION WITH THESE COMMANDS

Tea Party

- | | |
|--|---|
| 4. ____ Give <u>me</u> a cup. | 9. ____ Put a knife by <u>his</u> plate. |
| 15. ____ Give <u>them</u> a cup.
(Then give child a cup.) | 7. ____ Give a knife to <u>her</u> . |
| 12. ____ <u>They</u> want spoons.
(Then give spoons to all.) | 5. ____ Put a knife by <u>your</u> plate. |
| 14. ____ Put the spoons in <u>their</u> cups. | 10. ____ Give <u>him</u> a fork. |
| 8. ____ <u>He</u> wants a napkin. | 13. ____ Give <u>us</u> forks.
(Score plus if forks are given to the examiner and the subject; of if given to the examiner, the subject, and the female doll.) |
| 11. ____ <u>You</u> take a napkin. | 2. ____ Where is <u>my</u> cup? |
| 1. ____ I want a napkin.
(Then give "her" a napkin.) | 17. ____ Put spoons in <u>our</u> cups. |
| 6. ____ <u>She</u> wants a plate. | 3. ____ Which cup is <u>mine</u> ? |
| 16. ____ <u>We</u> want plates.
(Plates to all. Score plus if plates are given to the examiner and the subject; or if given to the examiner, the subject, and the female doll.) | 56. ____ Give me <u>all</u> the cups.

(Remove the tea set.) |

Tea Set Materials

1 male doll	4 cups	4 knives	4 spoons
1 female doll	4 plates	4 forks	4 napkins

APPENDIX B

LIST OF ALL EIGHTEEN DEICTIC PRONOUN SENTENCES

1. The lion hit the bear and then He hit the tiger.
2. The lion hit the bear and then He hit him.
3. The tiger hit the lion and then he hit HIM.
4. The tiger hit the lion and then he hit the bear.
5. The lion pushed the bear and then HE pushed him.
6. The lion pushed the bear and then He pushed the tiger.
7. The bear hit the tiger and then he hit him.
8. The bear pushed the tiger and then he pushed him.
9. The bear hit the tiger and then the lion hit him.
10. The tiger pushed the lion and then he pushed HIM.
11. The lion kicked the bear and then HE kicked him.
12. The lion kicked the bear and then He kicked the tiger.
13. The tiger pushed the lion and then he pushed the bear.
14. The bear pushed the tiger and then the lion pushed him.
15. The tiger kicked the lion and then he kicked the bear.
16. The bear kicked the tiger and then he kicked him.
17. The tiger kicked the lion and then he kicked HIM.
18. The bear kicked the tiger and then the lion kicked him.

VITA

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In 1979 he entered the University of North Carolina at Charlotte. He received his Bachelor of Arts degree in psychology and a minor in linguistics, graduating on the Chancellor's list in August 1981.

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