1975

Verbal models provided for mentally retarded children by parents

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<https://doi.org/10.15760/etd.2520>

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AN ABSTRACT OF THE THESIS OF Lance Tsugawa for the Master of Science
in Speech Communication: Emphasis in Speech Pathology/Audiology
presented November 13, 1975.

Title: Verbal Models Provided for Mentally Retarded Children by
Parents.

APPROVED BY MEMBERS OF THE THESIS COMMITTEE:

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Recent investigation has focused on the nature of adult-child verbal interactions. The research has examined the language of mothers and other adults when assembled with both normal and retarded children. The present study was undertaken to test the hypothesis that mothers of children with Down's Syndrome and mothers of normal children would present different language characteristics to a Down's Syndrome child versus a normal child. Type-token ratio, a measure of the subject's language diversification, was used as the behavioral measure.

The findings indicated that all mothers presented smaller type-token ratios to the Down's Syndrome child than those addressed to the normal child. The results were statistically significant at the .0005 level of confidence on a one-tailed test.

No significant differences in type-token ratio were found between groups of mothers of Down's Syndrome children and mothers of normal children in speeches addressed to the Down's Syndrome child or to the normal child. Both groups of mothers modified their language similarly to each child.

VERBAL MODELS PROVIDED FOR
MENTALLY RETARDED CHILDREN
BY PARENTS

by
Lance Tsugawa

A Thesis Submitted in Partial Fulfillment of the
Requirements for the Degree of

MASTER OF SCIENCE IN SPEECH COMMUNICATION

with an emphasis in

SPEECH PATHOLOGY AND AUDIOLOGY

Portland State University

1975

TO THE OFFICE OF GRADUATE STUDIES AND RESEARCH:

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November 13, 1975

ACKNOWLEDGEMENTS

With gratitude and appreciation, I would like to thank my chairman and graduate advisor, Joan McMahon, for her support and advice through the period of this research. It was a long and seemingly difficult task made easier by her sane and practical guidance. Special thanks to my committee for their time, knowledge, and consideration: Dr. Robert English, Dr. Daryl Anderson, and Dr. Jack Hegrenes.

To my wife, Arlynn, my love and deepest appreciation for the wealth of patience and consideration she extended to me during my graduate study. Thank you, honey. We made it!

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CHAPTER I

INTRODUCTION AND STATEMENT OF PURPOSE

INTRODUCTION

Fundamental to the process of language development in children is the amount and quality of environmental stimulation they receive. Wilkinson (1971) has stated that the nature of the adult-child dialogue is of primary importance in the language development of children. The way children are talked to by adults, their parents, and in particular their mothers, determines in large measure their linguistic growth. Wilkinson (1971, p. 104) further explains:

The mother's language is the model, and that the good mother is consciously or unconsciously aware of this is indicated by the way she often speaks simple, distinct, well-formed sentences to her child. With the child's own language she does several things: notably, seizing upon sounds in his stream of babble and reinforcing them and a little later, expanding his own telegraphic contractions in a variety of transformations. The early teaching is particularly concerned with supplying nouns and verbs by giving names to things and actions.

Emphasis placed upon parent-child language activities in the home appears to be a significant factor in linguistic development. Mothers vary greatly in how they stimulate their children's language growth. Some use baby talk; some are very silent, while others are more consistently verbal. The linguistic environment of the language-learning child does not remain constant, but varies markedly within the mother-child dyad, and in response to a number of variables.

The question of what is appropriate stimulation is further complicated if the child is mentally retarded. Language delay is common, and in many cases severe. The role of the mother in stimulating language development in her mentally retarded child is yet unclear. How she talks to her child may significantly influence the degree to which he will achieve linguistic competence.

STATEMENT OF PURPOSE

The purpose of this study was to analyze the language mothers of children with Down's Syndrome and mothers of normal children addressed to a Down's Syndrome child with delayed speech and language in comparison to the language they addressed to a child of similar chronological age with normal speech and language. Type-token ratio (TTR), which is the ratio between the number of different words (types) to the total number of words (tokens) in a given sample of speech (Spradlin and Rosenberg, 1964), was analyzed within the speech addressed to both the Down's Syndrome child and the normal child by both groups of mothers (see procedures section).

The following null hypotheses were tested:

1. Averaged type-token ratios within speech addressed to the Down's Syndrome child will be equal to those addressed to the normal child by all mothers when considered as a group.
2. Mothers of children with Down's Syndrome will have averaged type-token ratios equal to those of mothers of normal children in the speech addressed by both groups of mothers to the Down's Syndrome child.

3. Mothers of children with Down's Syndrome will have averaged type-token ratios equal to those of mothers of normal children in the speech addressed by both groups of mothers to the normal child.

CHAPTER II

REVIEW OF THE LITERATURE

Interest in how mature adult speakers talk to children has increased in recent years. Brown and Bellugi (1964) studied the linguistic interaction between a mother and her normal two-year old child and found the mother's speech differed from the speech adults use to each other in many ways. Her sentences were short and simple; for the most part, they were largely the kinds of sentences the child would produce a year later.

Snow (1972), in an unpublished doctoral dissertation, found that the speech of middle-class mothers was simpler and more redundant when they spoke to two-year olds than when they spoke to ten-year olds. Similar findings were made by Phillips (1971) in an investigation of the speech mothers used with their children and that which they used with other adults. The speech to adults had consistently longer utterances, more verbs per utterance, more modifiers per utterance, a greater proportion of function words, a smaller proportion of content words, and more verb forms than the mothers' speech to their children.

Broen (1972), in studying the verbal environment of the language-learning child, found mothers used fewer words per minute, had fewer disfluencies, and a smaller type-token ratio in speech directed toward their children than in speech addressed to their older children. Larger TTRs indicate a greater number of different words used. Broen (1972, p. 15) further reported that speech used with the young children

contained sentences that were well marked by pauses. She stated:

False or confusing information in the form of extraneous conjunctions and broken sentences is absent. Single words are used as sentences more often in speech to young children than they are in speech to older children or adults.

Brown and Bellugi (1964) investigated the role of imitation in mother-child dialogues. Analysis of the children's speech indicated many of their utterances were reduced imitations of the mother's utterances. Words were omitted, but the word order of the sentences was maintained. Conversely, mothers often imitated their children with expanded utterances. Incomplete child utterances were often expanded by the mothers to the nearest properly formed complete sentence. They concluded that mother-child interaction is, much of the time, a cycle of such reductions and expansions.

Cazden (1969) investigated the effect of treating language-delayed children with three experimental conditions. One group received intensive and deliberate expansion of their utterances, a corrective process. The second group received models of an equal number of well-formed sentences that were deliberately not expansions. A third group, acting as a control, received no stimulation. The findings indicated modeling, not expanding, was the more effective stimulation technique.

The importance of mature speech models for the child to perceive and imitate has been pointed out by a number of researchers (Brown and Bellugi, 1964; Cazden, 1972; Wilkinson, 1971). The degree to which these models are a factor in the process of increasing the child's linguistic growth seems to be related to the mother's interest in language training during the preschool years. This may be demonstrated

in her actual attempts to foster the development of linguistic skill.

Molyneaux (1972) examined adult speech through interviews with parents of children with normal speech and language and parents of children who were diagnosed as speech and language delayed. The findings indicated a significantly greater percentage of mothers of the normal group read to their children regularly and had commenced this practice when their children were several years younger. They encouraged memorizing nursery rhymes and regularly had informal chats with their children to discuss their activities. The results strongly suggested that children of the normal group were consistently exposed to a greater amount of parental speech stimulation than children of the delayed group.

A large research project, dealing with language as a factor in the socialization of children, was conducted in London by Brandeis and Henderson (1972). Information was obtained on maternal attitudes toward language through interviews with the mother. The children's language ability was measured at age five and again at age seven. They concluded that a child's measured language ability was related to the ways mothers responded to their children's questions and gave explanations.

Investigation of adult verbal behavior with retarded children is relatively limited and of recent origin. A series of the most recent studies in this area were performed at the Parsons State Hospital and Training Center, Parsons, Kansas. In the first of these, Spradlin and Rosenberg (1963) based their research on the hypothesis that adults may respond to low level verbalizers in such a way as to perpetuate a

low level of performance. In their study, adult subjects were asked to interview "low" and "high" verbal, mentally retarded children. Their primary concern was the ways in which the verbal levels of these children would selectively influence the language used by adults. They suggested that children of low verbal levels would influence the adult subjects to ask a greater proportion of binary questions, those calling for a two-choice answer such as "yes" or "no." A greater percentage of questions addressed to children of higher verbal levels would be multiple or "open-ended."

It appeared likely that low verbal children would be more prone to respond to binary rather than multiple questions, and consequently, the children would "condition" the adults to use a greater proportion of binary questions. They assumed that failure of the child to respond to a specific type of adult question would cause the adult to extinguish in that behavior. The results of the study indicated low level children elicited a larger proportion of binary questions than did the high verbal children. Of interest also is the finding that adults used a significantly larger average type-token ratio with the high verbal children.

Additional studies were performed using this same interpersonal model with some extensions and modifications. Siegel (1963a) constructed "play therapy-like" situations to test the hypothesis that adult verbal behavior would vary according to the verbal level of the mentally retarded children with whom they interacted. The subjects of the study were two adults, a 44-year old housewife and a 22-year old college student. They were assembled with four "low" verbal and four

"high" verbal level mentally retarded children. Measures of adult words, adult questions, and Mean Length Response (MLR) revealed no significant differences in the adult verbal behavior with high or low level children.

In a third study, Siegel and Harkins (1963) assembled 21 college students with one high verbal level and one low verbal level mentally retarded child in a structured (teaching) and an unstructured (free) situation. Their analysis of data indicated the adults used more responses, greater MLRs, and larger TTRs with the high verbal children. The type of situation exerted considerable influence on both child and adult verbal behavior. The adults asked more questions in the unstructured situation and made more responses in the structured situation. They also used more words, presented longer MLRs, and larger TTRs in the structured situation. The children were found to use considerably fewer words during the structured condition.

A subsequent study by Siegel (1963b) assembled adults with high and low verbal level mentally retarded children. Half of the adults were assigned to an "interview" condition; the other half to a clinical condition where spontaneous child verbalization was encouraged. Of the measures analyzed, adults in both experimental conditions were found to use significantly larger TTRs, longer MLRs, and ask fewer questions of the high level children.

In a later study, Siegel (1963c) assembled 20 adults in a structured (teaching) and an unstructured (free) situation with one retarded child who had been labeled "high" and another who had been labeled as "low" in verbal behavior. The labels were assigned randomly

without regard for the actual verbal levels of the children. The question posed was whether adults respond to children labeled as "high" or "low" the same as to those children who were actually high or low in verbal ability. The measures used were adult TTR, number of adult questions, vocal responses and words. Analysis of the results indicated the adults did not respond differently on any of the measures on the basis of the label assigned.

Since the children were all of low verbal abilities, and no appreciable differences were found in adult language, the labels assigned seemed to exert no influence. Siegel (1963c) felt the obvious variable responsible for the results might be the actual verbal level of the children. The procedures and criteria measures in this study were comparable to those in the Siegel and Harkins (1963) study. Designations of high and low verbal levels in the latter study, however, referred to actual differences in verbal skills rather than random labels. Siegel compared the mean scores of adult verbal behavior with low level children in both investigations. All measures were very similar. In particular, the adults had averaged TTRs of .390 as compared to .385 in the Siegel and Harkins (1963) study. In the face of contradictory information, the verbal characteristics of the retarded children seemed to exert considerable influence over adult responses. Siegel (1963, p. 32) further explains:

In interactions between retarded children and teachers or clinicians for example, the adult is typically considered to be in some manner manipulating or modifying the behavior of the child. However, the child may in turn exert considerable influence over the persons in his environment. In the realm of language, the degree of verbal stimulation the child experiences may be related to the kinds of verbal or other cues he presents. Thus, the child whose speech

behavior is severely limited or inappropriate may evoke patterns of responses from adults that discourage him from extending or improving his verbal performance.

In research conducted at the Parsons State Hospital, investigators in a number of studies (Siegel, 1963b; Siegel, 1963c; Siegel and Harkins, 1963; Spradlin and Rosenberg, 1963) consistently found larger averaged TTRs in adult speech with high verbal level retarded children compared to low level retardates. The similarity of these findings in several studies seems to indicate the effect is not an isolated one.

Snow (1972) investigated the language of mothers in interaction with their 2 year old and 10 year old normal children and found that the younger children played some role in eliciting their mothers' speech modifications. The task difficulty of the experimental situation had no effect on the production of the mothers' speech modifications, indicating those modifications were not a response to the children's cognitive immaturity. Rather, the kind of simplification for the young children seemed to be a product of the adult's communicative competence and the cues provided by the child. Snow stated that the children were less attentive and less compliant when listening to unmodified adult speech. She felt these responses to unmodified speech might be the means by which children elicit speech modifications from adult speakers.

Hegrenes, Marshall, and Goldstein (1973) using Skinner's (1957) classifications of verbal operants, investigated the verbal interactions of 3 to 5 year old, mentally retarded and normal children with their mothers. Recorded samples of speech were obtained during free-play

situations and evaluated in terms of numbers of tacts, mands, intraverbals, and echoics for both mothers and children. Their results indicated a greater frequency of tacts, mands, and intraverbals among children of the non-retarded group, and a greater frequency of echoics emitted by the retarded children. Mothers of both groups were qualitatively similar in their usage patterns. Mands occurred most frequently, with tacts, intraverbals, and echoics following in order of frequency. Of interest is the fact that no significant differences were found between mothers of retarded and non-retarded children in their frequency of tacts, intraverbals, and echoics emitted. Manding, however, occurred with greater frequency among the mothers of retarded children.

The researchers felt this may be explained by a number of factors. The child, with his decreased mental capacity and relatively increased physical mobility, might require greater external control by the parent through manding. The lower expressive ability of the retarded child also may serve to extinguish the mother's tacts, intraverbals, and echoics, leaving the mother with only an habitual manding response. Assuming the child responds to the mother's commands with a motoric response rather than a verbal one, her manding behavior may be further reinforced. The child, with his lower expressive ability, may respond to commands by acting rather than talking. This may also be responsible for the asymmetry in frequency of verbal responses between the mothers and children. The actual verbal levels of the retarded children in this study seem to be an important factor in influencing their mother's language.

In general, the speech of mentally retarded children is often significantly delayed. Children with Down's Syndrome, in particular, ". . . reveal a deceleration of physical and mental development with the result that they grow and mature at a slower rate (Benda, 1960)."

Down's Syndrome, commonly referred to as Mongolism, is a genetic disorder and one of the most common causes of mental retardation. Jordan (1960) has found a close relationship between Down's Syndrome and the probability of language disorders. In extensive research, Lenneberg, Nichols, and Rosenberg (1962) have studied language development of the Down's Syndrome child. They followed 61 Down's Syndrome children living at home over a three-year period using a variety of psychological and language assessments. Of particular interest is the analysis of the ability of children displaying Down's Syndrome to acquire rules of syntax and morphology. The results suggest their intellectual limitations do not produce bizarre behavior forms, but merely result in an arrest of development at a primary level.

The types of verbal cues the child with Down's Syndrome presents to the mother may be similar to that of a younger, normal child, but the degree to which his mother will modify her speech to provide appropriate stimulation is unknown. The ways in which she fosters the language development of her child may be an influential factor in his growing linguistic competence. Over time, the Down's Syndrome child will develop speech and language at a significantly slower rate than his normal counterpart (Lenneberg, 1962). The mother may produce speech which is short and simple; it may be readily understandable to the child, but be inadequate as a stimulating language model. Con-

CHAPTER III

METHODS AND PROCEDURES

METHODS

Subjects

The subjects utilized in the present investigation consisted of twelve mothers. Six were mothers of children with Down's Syndrome, selected randomly from the files of the Crippled Children's Division (CCD), University of Oregon Health Sciences Center, and six were mothers of normal children who were selected at random from the general population of the greater Portland metropolitan area.

One boy of 8-2 years of age with Down's Syndrome and delayed speech and language was selected from the files of CCD to serve as the experimental subject. A second boy, 7-8 years of age with normal speech and language served as the control subject. Neither child was the offspring of any of the twelve previously selected mothers.

Instrumentation

The Utah Test of Language Development (Mecham, Jex and Jones, 1967), a receptive and expressive language instrument, was used as the language measure to evaluate the level of each child's language. The child with Down's Syndrome achieved a language age of 2-11 years while the normal child received a language age score at the 8-3 year level.

Type-token ratio (TTR) (Spradlin and Rosenberg, 1964), a measure of the diversification of the subject's language, was used to

versely, the mother's speech may be too complex for the child to comprehend. By describing the actual types of speech mothers present to their mentally retarded child, a basis for further research will be established regarding the question of what is optimal language stimulation for mentally retarded child. The present study investigates one parameter of the linguistic model provided for retarded children by mothers.

analyze the mothers' responses. After completion of all sessions, typed transcripts from the 10-minute recordings were prepared of the mothers' speech by the investigator. All remarks of the child and unintelligible words of the mothers were omitted. To calculate TTR, the middle 200 words were extracted from individual transcripts for each session. The number of different words (types) were counted and divided by the 200 word (tokens) sample to yield a ratio. Protocol for counting words was taken from Johnson, Darley and Spriestersbach's (1963) method for computing MLR. For example, contractions, such as "it's" and "I'm" were counted as two words; compound nouns such as "Mickey Mouse" were counted as one word. In addition to this protocol, words that occurred in singular and plural forms, or present and past tense were counted as two different words. For example, "horse" and "horses", or "walk" and "walked" were counted as two different words in a particular sample.

Mean or averaged TTRs were computed for groups of: mothers of normal children, mothers of Down's Syndrome children, and all mothers combined, in interactions with each child.

PROCEDURES

Experimental Condition

The order in which mothers were assembled with a particular child was randomized, with each mother spending 10 minutes with each child. Mothers were instructed to play with the child and encourage him to play and "chat" informally. They were informed that the purpose of the study was to observe some of the behaviors of a retarded

child when interacting with a variety of adults. Additionally, they were told their interactions with a normal child also would be observed for comparison with their interactions with the retarded child.

The experimental sessions were conducted in an eight by twelve foot clinical room, equipped for audio and visual observation. A Panasonic cassette recorder, model #RQ 309 AS, was placed in the room out of the participant's vision to record the ten minute sessions. All subjects were informed the sessions would be recorded.

To aid the mothers in stimulating free-play and conversation, each was given a number of simple toys which they were told to use at their discretion. Five different toys were selected randomly for each ten minute session from a pool of fifteen toys. The toys, which would provide interest across a variety of age levels, were selected through the suggestions of a staff occupational therapist at CCD (see Appendix).

Each child was seen by one mother of a normal child and one mother of a child with Down's Syndrome for a total of two ten-minute sessions for each child per day. The six days needed to complete the experiment were spaced over a two-week period to avoid child fatigue.

Analysis of Data

Data from the transcripts were analyzed using t-tests to determine whether significant differences occurred between averaged TTRs presented by groups of mothers to the Down's Syndrome child and the normal child.

CHAPTER IV

RESULTS AND DISCUSSION

RESULTS

The purpose of this investigation was to determine if there was a significant difference between the language presented by mothers of Down's Syndrome children and mothers of normal children to a child with Down's Syndrome, who is delayed speech and language, and a child of similar age with normal speech and language. The null hypotheses to be tested in this investigation were:

1. Averaged type-token ratios within speech addressed to the Down's Syndrome child will be equal to those addressed to the normal child by all mothers when considered as a group.
2. Mothers of children with Down's Syndrome will have type-token ratios equal to those of mothers of normal children in speech both groups of mothers address to the Down's Syndrome child.
3. Mothers of children with Down's Syndrome will have type-token ratios equal to those of mothers of normal children in speech both groups of mothers address to the normal child.

A summary of TTRs presented by mothers to each child is presented in Table I. TTRs in speeches presented by mothers of Down's Syndrome children to the Down's Syndrome child ranged from .365 to .435, and from .425 to .545 for the normal child. TTRs of mothers of normal children in speeches addressed to the Down's Syndrome child ranged

TABLE I

AVERAGE GROUP AND INDIVIDUAL
TTRs FOR MOTHERS IN
MOTHER-CHILD INTERACTIONS

Mothers of Down's Syndrome Children with the:	Down's Syndrome Child TTR	Normal Child TTR
I.	.410	.440
II.	.395	.460
III.	.380	.475
IV.	.435	.475
V.	.380	.425
VI.	.365	.545
	Group Average ($\bar{x}$) .394	Group Average ($\bar{x}$) .470
	S.D. 2.522	S.D. 4.171
Mothers of Normal Children with the:	Down's Syndrome Child TTR	Normal Child TTR
I.	.385	.470
II.	.385	.490
III.	.380	.475
IV.	.360	.435
V.	.410	.530
VI.	.380	.465
	Group Average ($\bar{x}$) .383	Group Average ($\bar{x}$) .478
	S.D. 1.602	3.142

from .360 to .410, and from .435 to .530 within speeches to the normal child.

Of interest is the finding that individual mothers had consistently smaller TTRs within speeches to the child with Down's Syndrome than in speeches addressed to the normal child. The averaged TTRs for all mothers of Down's Syndrome children in interactions with the Down's Syndrome child were .394 and .470 with the normal child. The averaged TTRs for mothers of normal children in speeches presented to the child with Down's Syndrome were .383 and .478 for speeches presented to the normal child.

To determine if the differences between the means were statistically significant, t-tests were performed on averaged TTRs for interactions between each child for both groups of mothers. A third t-test was performed for the pooled average TTR for all mothers in speeches presented to the Down's Syndrome child and the normal child. The three values of t appear in Table II and indicate statistically significant differences in TTRs presented to the Down's Syndrome child and the normal child. An affirmation level of .01 was used to determine significance.

TABLE II

t-Values for Average TTRs Addressed
to the Down's Syndrome Child and the
Normal Child

Comparison Groups	t	df	p
Mothers of Normal Children with the Down's Syndrome child vs. the normal child	6.54	10	<.0005
Mothers of Down's Syndrome Children with the Down's Syndrome child vs. the normal child	3.81	10	<.005
Mothers of Down's Syndrome children and mothers of normal children, with the Down's Syndrome child vs. the normal child	7.27	22	<.0005

The 7.27 value of t for all mothers in interactions with the Down's Syndrome child and the normal child is significant at the .0005 level of significance on a one-tailed test.

An implicit question asked in the second and third null hypotheses was whether statistically significant differences would occur in TTRs presented to each child between each group of mothers. T-tests were performed to test these hypotheses. The results are presented in Table III.

TABLE III

t-Values for Average TTRs
Presented Between Groups
of Mothers to Each Child

Comparison Groups	t	df	p
Mothers of Normal Children vs. Mothers of Down's Syndrome Children, with the Down's Syndrome Child	.884	10	>.10
Mothers of Normal Children vs. Mothers of Down's Syndrome Children, with the Normal Child	.352	10	>.10

A t value of .884 indicated no significant difference between TTRs addressed to the Down's Syndrome child by groups of mothers. For average TTRs addressed to the normal child, a t of .352 indicated no significant difference between groups of mothers of Down's Syndrome children and mothers of normal children.

DISCUSSION

A statistically significant difference was obtained between type-token ratios presented by all mothers to the Down's Syndrome child and to the normal child.

All mothers used smaller TTRs with the Down's Syndrome child than those used with the normal child. Stated another way, all mothers used a smaller, lesser diverse vocabulary in interaction with the Down's Syndrome child than with the normal child. The results would lead this researcher to reject the first null hypothesis.

The findings lend support to the hypothesis that adult verbal behavior is influenced by the linguistic characteristics of retarded children with whom they interact. As is indicated in Table I, scores for TTR presented to the two children show a distinct and consistent pattern across both groups of mothers. In terms of this one measure, all mothers modified their language with quantitatively fewer numbers of words presented to the Down's Syndrome child.

In the present investigation, average TTRs of .394 and .383 were obtained in mothers' speeches to the Down's Syndrome child. These are remarkably similar to those obtained in earlier studies. Adults assembled with low verbal retarded children in the Siegel (1963c) study had average TTRs of .390 as compared to .385 in the Siegel and Harkin's (1963) study.

The verbal level of each child was sufficiently different to provide a contrast in the language characteristics they presented. Mothers in the study were essentially interacting with two children of widely disparate language abilities and interests.

There are a number of things the mothers did in talking with the Down's Syndrome child which may have resulted in smaller TTRs. Informal observation of the sessions showed that most verbal interactions with the Down's Syndrome child dealt specifically with the toys used during play. Comments directed to the child with Down's Syndrome appeared to be relatively "concrete," dealing with actual characteristics of the toys and the play activity.

In contrast, conversations with the normal child often seemed to center around activities and interests of both participants outside the immediate situation. The researcher felt these interactions were

of a more abstract nature. The apparent difference in abstraction levels of the conversations seems to be related to the verbal cues presented by each child. For example, open-ended questions presented to the child with Down's Syndrome, such as "What do you do in school?" or "What did you do on your vacation?" were often left unanswered. The child's limited response to these types of questions may have acted as a cue to the mothers to modify their conversation to a more restricted range of topics, e.g. the toys in the room. These informal observations agree with Spradlin and Rosenberg's (1963) conclusions in research regarding binary and multiple questions in adult-retarded child interactions.

Though not evaluated in this study, the researcher felt the Down's Syndrome child more often displayed confusion or non-understanding of verbalizations directed toward him than did the normal child. Non-understanding of the adult's speech was often indicated by the child's inappropriate behavior, such as an incorrect motoric response to a command. Many times the child with Down's Syndrome would ask "What?" in response to a mother's statement, or completely ignore her remark. Mothers were observed often to repeat whole phrases to the Down's Syndrome child. These may be considered cues to the adult to modify her speech. Limiting the range of topics and use of simpler patterns seemed to be two such modifications. It seemed clear that the more concrete, simpler, and redundant verbalizations to the retarded child elicited greater comprehension and response. Broen (1972) is in similar agreement from her research in verbal interactions of mother-normal child dyads. Such modifications to a more restricted

language may perhaps be responsible for the smaller TTRs.

No statistically significant differences were found between TTRs presented by mothers of normal children and mothers of children with Down's Syndrome to the Down's Syndrome child. It would seem that the experience of a mother in raising her own retarded child did not cause her to modify her own language to the Down's Syndrome child more than a mother with normal children. Average TTRs for each group of mothers in interactions with the Down's Syndrome child were nearly equal (Table I: Mothers of Down's Syndrome children - .394, mothers of normal children - .383). Similar findings were obtained for both groups of mothers in speeches addressed to the normal child (Table I: Mothers of Down's Syndrome children - .470, Mothers of normal children - .478). Null hypotheses II and III therefore, were accepted.

What is yet unclear from these findings is whether adult verbal behavior when modified in this fashion, has a beneficial influence on the language-learning child. Such modifications may lack the needed stimulation to enhance the retarded child's linguistic growth. In the absence of a child's "normal" response to verbal interaction, parents may inappropriately modify or partially extinguish speech to the retarded child. The complexity of this question increases as the child grows older. Parents may find it increasingly difficult to use simplified language with a physically more mature retarded child, whose language is still at a lower level. The optimum, in this instance, seems to be a language model whose structure is within the retarded child's comprehension, yet advanced enough to stimulate linguistic growth. Snow (1972, p. 564) states:

The modifications which mothers produce for young children may be valuable in at least two ways. The first value, no doubt intended by the speaker, is to keep his speech simple, interesting, and comprehensible to young children. The second value unintended by the adult but potentially as important as the first, is that simplified speech is admirably designed to aid children in learning language. This makes it somewhat easier to understand how a child can accomplish the formidable task of learning his native language with relative ease. The willingness of the child's parents to produce simplified and redundant speech, combined with the child's simple, meaningful, and comprehensible utterances, provide the child with tractable, relatively consistent, and relevant linguistic information from which to formulate the rules of grammar.

Qualifications

The design of this research necessarily structured interactions of the Down's Syndrome child and the normal child with mothers who were not their own. The two children served as a self-contained experimental and control condition, eliminating the need to use controlled populations of mothers in interaction with their own children. It is of course impossible to state that each child was a representative sample of the retarded or normal population. Each child did, however, present definite contrasts in linguistic ability to the mothers.

Since this investigation was conducted in a clinical setting, and assembled mothers with children who were not their own, it is difficult to generalize freely from these findings to the actual linguistic environment of retarded children. There is no assurance that mothers talk and modify their language in the previously discussed manner with their own retarded children. The mother's language, however, did demonstrate significant differences between the two children. Further, they were assembled in an unnatural situation. This may

indicate the effect of each child's verbal ability on the mother's expressive language was relatively powerful.

CHAPTER V

SUMMARY AND IMPLICATIONS

SUMMARY

Recent investigations have focused on the nature of adult-child verbal interactions. The research has examined the language of mothers and other adults when assembled with both normal and retarded children. The present study was undertaken to test the hypothesis that mothers of children with Down's Syndrome and mothers of normal children would present similar language characteristics to a Down's Syndrome child versus a normal child. Type-token ratio, a measure of the subject's language diversification, was used as the behavioral measure.

The following null hypotheses were tested:

1. Averaged type-token ratios within speech addressed to the Down's Syndrome child will be equal to those addressed to the normal child by all mothers when considered as a group.
2. Mothers of children with Down's Syndrome will have type-token ratios equal to those of mothers of normal children in speech both groups of mothers address to the Down's Syndrome child.
3. Mothers of children with Down's Syndrome will have type-token ratios equal to those of mothers of normal children in speech both groups of mothers address to the normal child.

The findings led to rejection of the first null hypothesis. All mothers presented smaller type-token ratios to the Down's Syndrome

child than those addressed to the normal child. The results were significant at the .0005 level of confidence on a one-tailed test.

No significant differences in type-token ratio were found between groups of mothers of Down's Syndrome children and mothers of normal children in speeches addressed to the Down's Syndrome child or to the normal child. Both groups of mothers modified their language similarly to each child. With regard to these findings, the 2nd and 3rd null hypotheses were accepted.

IMPLICATIONS

The results of this study suggest that differences in mother's language to a retarded child and a normal child do exist. It would be interesting to determine if the present findings hold true for mothers with their own retarded child and an older, normal sibling. Would a young, normal child, matched for language ability with an older, retarded child, elicit similar language characteristics from mothers? Certainly it would also seem appropriate to investigate mothers' language to a young, retarded child and a normal, non-sibling of the same age, or, in another instance, an older, non-sibling. In addition, it would be interesting to study the retarded child's ability to respond to increasingly difficult levels of verbal abstraction. How does varying the abstraction level affect his comprehension and expressive vocabulary? Would the programming of increasingly more abstract vocabulary and syntax in language treatment stimulate linguistic as well as cognitive growth?

Further, the effects of varying patterns of adult verbal behavior should be investigated. What kinds of verbalizations increase the

retarded child's comprehension and cooperation? What kinds of linguistic stimulation increase his spontaneous verbalization? The direction of research should progress toward determining the types of verbal models and strategies that most efficiently aid the retarded child's linguistic growth. The results of research in these areas may very well have a profound impact on clinical treatment and parent counseling with the retarded child.

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APPENDIX

TOYS USED AS STIMULUS

ITEMS IN MOTHER-CHILD DYADS

1. Musical Ferris Wheel
2. Tool Box (real tools)
3. Tool Box (toy tools)
4. Leggos
5. National Geographic Magazines (3)
6. Puzzle of the U.S.
7. Toy Blocks
8. Picture Dominoes
9. Toy train (wood type)
10. Crayons and Paper
11. Musical Merry-go-round
12. Chatter Box (Ideal Co.)
13. Toy Truck
14. Toy Helicopter
15. Beads and String

Protocol: Five different toys were chosen randomly from the pool of toys for each ten-minute session.