

DOCUMENT RESUME

ED 098 569

PS 006 969

AUTHOR Buium, Nissan; Rynders, John
TITLE The Early Maternal Linguistic Environment of Normal and Down's Syndrome (Mongoloid) Language Learning Children.

INSTITUTION Minnesota Univ., Minneapolis. Research, Development, and Demonstration Center in Education of Handicapped Children.

SPONS AGENCY Bureau of Education for the Handicapped (DHEW/CE), Washington, D.C.

REPORT NO RR-51
BUREAU NO 332189
PUB DATE May 73
GRANT OEG-09-332189-4533 (032)
NOTE 136p.

EDRS PRICE MF-\$0.75 HC-\$6.60
DESCRIPTORS *Language Development; *Linguistic Patterns; *Mongolism; *Parent Child Relationship; Parent Influence; *Preschool Children

ABSTRACT

To demonstrate that the child learning language constructs his theory of language on the basis of the linguistic data available to him, this study investigated 21 linguistic parameters that Down's Syndrome and normal children are exposed to in their maternal linguistic environment. It was found that mothers produced certain levels of linguistic parameters more frequently than others. Psychologists and linguists suggested that the same levels emerged earlier than others in the child's language. A possible relation between the frequency of usage of certain grammatical structures by the mother and their order of appearance in the child's language is suggested. It was also found that Down's syndrome children receive a different linguistic input than normal children in terms of frequency of occurrence of certain linguistic parameters. This difference is discussed in terms of later characteristics of Down's syndrome children's different, deviant, and delayed language. (Tables comprise more than half of this document.) (Author/DP)

RESEARCH REPORT #51

Project No. 332189
Grant No. OE-09-332189-4533 (032)

THE EARLY MATERNAL LINGUISTIC ENVIRONMENT OF NORMAL
AND DOWN'S SYNDROME (MONGOLOID) LANGUAGE LEARNING
CHILDREN

Nissan Bulum and John Rynders
University of Minnesota

Research, Development and Demonstration
Center in Education of Handicapped Children
University of Minnesota
Minneapolis, Minnesota

May 1973

The research reported herein was performed pursuant to a grant from the Bureau of Education for the Handicapped, U.S. Office of Education, Department of Health, Education and Welfare to the Center for Research, Development and Demonstration in Education of Handicapped Children, Department of Special Education, University of Minnesota. Contractors undertaking such projects under government sponsorship are encouraged to express freely their professional judgement in the conduct of the project. Points of view or opinions stated do not, therefore, necessarily represent official position of the Bureau of Education for the Handicapped.

Department of Health, Education and Welfare

U. S. Office of Education

Bureau of Education for the Handicapped

ED 088569

PS 006969



RESEARCH AND DEVELOPMENT CENTER
IN EDUCATION OF HANDICAPPED CHILDREN
Department of Special Education

Pattee Hall, University of Minnesota, Minneapolis, Minnesota 55455

The University of Minnesota Research, Development and Demonstration Center in Education of Handicapped Children has been established to concentrate on intervention strategies and materials which develop and improve language and communication skills in young handicapped children.

The long term objective of the Center is to improve the language and communication abilities of handicapped children by means of identification of linguistically and potentially linguistically handicapped children, development and evaluation of intervention strategies with young handicapped children and dissemination of findings and products of benefit to young handicapped children.

6

Acknowledgment

The authors would like to thank Professor James Turnure for his numerous critical readings of the manuscript and helpful suggestions.

We would also like to express our appreciation to Drs. Donald F. Moores, Gerald M. Siegel and Barbara J. Best for their critical readings of the manuscript and their helpful suggestions.

Special thanks go to Dr. Pamela Mattick who kindly allowed us to use parts of her dissertation.

We would also like to thank Coral B. Sullivan, Ruth T. Donahue and David J. Wangsness for their help with the data. The collection of the data was coordinated by Judi Wolf.

This research was supported in part by funds from the Department of Special Education, University of Minnesota and in part by a grant to the University of Minnesota Research, Development and Demonstration Center in Education of Handicapped Children (OEG-09-332189-4533-032) from the U. S. Office of Education.

Abstract

The language learning child constructs his theory of language on the basis of the linguistic data that is made available to him. We investigated 21 linguistic parameters that Down's Syndrome and normal language learning children are exposed to in their maternal linguistic environment.

It was found that mothers produced certain levels of linguistic parameters more frequently than others. The same levels were suggested by psychologists and linguists to emerge earlier in the child's language. A possible relation between the frequency of usage of certain grammatical structures by the mother and their order of appearance in the child's language is entertained.

It was also found that Down's Syndrome children receive a different linguistic input than normal children in terms of frequency of occurrence of certain linguistic parameters. This difference is discussed in terms of later characteristics of Down's syndrome children's different/deviant/delayed language.

The Early Maternal Linguistic Environment of Normal and
Down's Syndrome (Mongoloid) Language Learning Children

Nissan Buium and John Rynders

University of Minnesota

Current theory and research in the field of language development places strong emphasis on universality of language acquisition and the existence of innate, biological determinants of such universality (Slobin, 1971; Chomsky, 1968; Lenneberg, 1967).

Given innate linguistic skills, the child must still discover the linguistic forms that are peculiar to his own language, and the information for this analysis must somehow be embedded in the speech he hears, (his linguistic environment) (Broen, 1973).

The role of the linguistic environment in the child's language acquisition process has been acknowledged in every statement of language theory. Miller and Chomsky (1963) argued that other input data besides LAD (Language Acquisition Device) may play an essential role in language learning... "what other inputs are necessary is... an important question for empirical investigation" (1963).

Lenneberg suggested that once maturation brings cognitive processes to a state of language readiness, the child requires certain raw materials from which it can shape building blocks for his own language development (1967).

Brown (1970) suspected that the only force toward grammaticality operating on the child was the occasional mismatch between his theory of the structure of the language and the data he received. Brown ventured the opinion that Piaget's terms, "assimilation" (the present

theory), "accomodation" (the input of the data) and "disequilibrium" (the mismatch), were created to deal with a similar lack of extrinsic motivation in the child for progressing toward operativity (1970).

Despite this unquestioned importance of the input data or the linguistic environment from which the child constructs his theory of language, very little information is available regarding its nature. For many years it has been assumed (with little reliable empirical justification) that children hear a random sample of adult utterances, characterized by all the mistakes, stutters, garbles, inconsistencies and complexities which are common in adults' speech to other adults (Snow, 1972; McNeill, 1970; Lenneberg, 1969; Chomsky, 1965).

Recent empirical investigations have not verified the above assertions. Instead, it was found that mothers tend to modify some of their linguistic parameters when addressing their younger children; their speech was simpler, shorter, more redundant and slower, with pauses located always at sentence boundaries (Snow, 1972; Brown, 1973). In an investigation of the word order parameter of a parent-child verbal interaction in a relatively free word order language (Hebrew), it was found that the parent used different frequencies of word orders in his verbal interaction with his child than he did with an adult (Bulum, in press).

In acquiring his first language, the child constructs hypotheses about it from a modified version of the adult language, and will accept as part of his theory any hypothesis which seems to make order among the incoming signals (Deese, 1970). Thus, the incoming

linguistic information is crucial to the extent that its signal construction becomes the target for the child's theory of language. To this end there is a need to acquire extensive information on systematic characteristics of the linguistic environment. Thus, the present study looks at 21 language parameters of normal and Down's Syndrome children's early linguistic environment.

Study Purposes

1. To acquire extensive information regarding the kind of linguistic data on which the Language Acquisition Device of the child must operate to construct his theory of language.
2. To obtain information from Down's Syndrome children's early linguistic environment which will speak to the following:
 - a. Is a Down's Syndrome child confronted with the same linguistic input (data) (whereby to construct his theory of language) as a normal speaker?
 - b. What is the extent and kind of verbal accommodations and modifications made by parents, if any, when interacting with their Down's Syndrome children?

Method

Subjects

Eleven mother-child pairs were selected for this study. Of these, the five mothers composing the normal group had normal 24 month old children; the remaining six, forming the non-normal group, were mothers of 24 month old Down's Syndrome children.

The Down's Syndrome children were selected for the study because

this condition is usually identified at birth, and parents are likely to be aware of apparent limitations in their child while interacting with him.

The two groups were matched on the following criteria:

A. Family Variables

1. Parents expecting to rear child in their own home for early years of life
2. SES:
 - a. Income \$6,000 and up, unless a student
 - b. Educational level 10th grade or above
3. Maternal IQ 90 and up
4. Not bilingual
5. Mother free of any major sensory handicap

B. Child variables:

1. No debilitating heart defect or other serious physical impairment
2. No debilitating sensory impairment in vision or hearing.

Data gathering situations

The language of the mothers as they interacted with their children in three different situations was collected via audio-video-tape recording.

Situation A; play situation. Test Apparatus. The infant was placed in a high chair on one side of the testing room. The chair was a light-weight, portable high chair with a reflective metal tray. Most of the children were able to sit without support. An infant seat was placed in the high chair first and then the tray was latched onto the high chair. All of the children were able to sit

comfortably with this adaptation. There was a folding chair or a secretarial office chair on the right side of the high chair. It was turned at an angle so that during the conditions when the mother was present with the child, she sat facing him. An illustration of the setting appears in Figure 1.

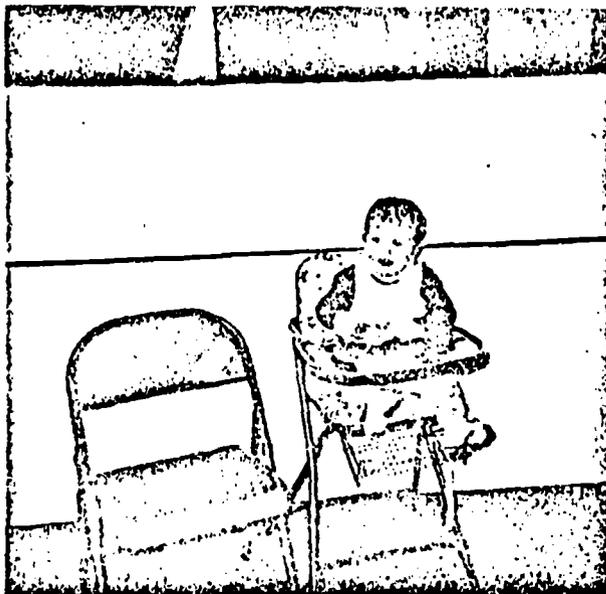


Figure 1 - Test Setting

The preselected toys included a hard, plastic, circular toy that contained moving parts and made a rattling noise. In the event that a mother indicated that a child had one of these toys at home, or if a child refused to explore the toy, a substitute toy of a different nature was given to him. The other toys included a soft rubber lion that made a noise when it was squeezed, a soft sponge Nerf ball, and a soft rubber turtle.

PS006969

Instructions to mothers:

"While I am taking these pictures, you will be seated in the chair by the baby. For these pictures, we want you to 'teach' the baby about that toy. You are to encourage him/her to play with this toy. You may encourage him/her by using words and telling him/her about the toy, or about what he might do with the toy. You may take the toy and do things with it to get his attention focused on the toy, but remember, the purpose of your teaching is to get him/her to play with the toy. Please remember not to touch the baby unless he/she is slipping in the chair. Do you have questions? When I say 'OK', you may begin teaching about the toy. Remember you are encouraging the baby to play with it."

Situation B; Table Setting I.**Description of Setting.**

The child was in the chair pulled up to the table and his mother was seated in another chair at the child's right side. The mother was instructed to help her child learn to set the table with the dishes in the box by her chair. She could do anything she preferred in order to help the child to learn the task. Two minutes were timed from the moment the mother began talking or when she placed an object on the table -- whichever occurred first. A signal to the mother that 30 seconds remained was given at the end of 90 seconds. At the end of the two minutes the mother was

instructed to ask the child to set the table on his own and was allowed the next 30 seconds for this purpose.

General Instructions to Mother

"We would like to see how your child responds in a problem solving situation. We would like him/her to learn to set the table. We chose this task because it is a natural problem-solving situation for a mother and her young child. It is a problem that the child will not be able to solve without your help as a teacher. We realize that this is a pretty tough problem so he/she will get credit for whatever part of it he/she can do."

Specific Instructions to Mothers

"We want your child to learn to set the table with these dishes (point out box) so that it looks like this (show picture). Your job will be to focus your child's attention on the problem, to keep him/her interested and to help him/her in whatever way you feel is appropriate. If your child drops or throws anything on the floor please don't pick it up. Just replace with another one from the box. Since it is a tough problem your child will get credit for whatever is placed on the placemat. Of course, more credit is given if it is also in the correct position. The child will have two minutes to learn to set the table. I will say '30 seconds left' when there are 30 seconds remaining. At the end of two minutes I will say 'stop.' Then I will ask you to pile all the

objects on top of the plate, put them on the right side of the placemat and ask him/her to set the table. We will look at his/her performance for 30 seconds. Do you have any questions? When I say 'okay' you may begin. Remember, we want the child to be able to set the table on his/her own as well as he/she can at the end of two minutes.

Situation C; Table Setting II.

The following instructions were given to the mothers:

"As we have all seen the task is quite hard. Let's give him/her a little more teaching to see if that will help--say another 2 minutes. Again, you may help him/her as a teacher in any way you feel is appropriate. At the end of two minutes we will ask you to pile all the objects on top of the plate, put them on the right side of the placemat and ask your child to set the table. We will look at his/her performance for 30 seconds. Do you have any questions? When I say 'Okay,' you may begin."

Data Collection

The child sat facing a large white screen which had a lens protruding from a slit in the screen's center. The investigator sat behind the screen after the testing had begun and operated the videotape recording equipment. The camera was mounted on a tripod to insure stability of the picture.

The recording equipment included a portable unit of Sony AV-3400 Videomover II (deck) and a Sony AVC-3400 Videomover II (camera). One half inch, 20 minute Sony video tape was used. Also used was Model 649B Dynamic Microphone (50' cord), Craig 2603 Solid State Automatic Level Cassette Recorder and Ampex 361 C60 Recording Cassette.

Playback equipment included Sony AV-3600 Sony-Matic solid state videocorder (deck) and Sony CVM-180VA screen monitor/TV receiver.

Data Analysis

The language of the mothers was transcribed from the tapes and analyzed. The transcriptions were made using the following Schiefelbusch (1963) criteria:

"In preparing these transcripts or protocols, you will be asked to perform a number of functions simultaneously:

1. You will have to do a careful and accurate job of representing all the verbal activity that occurred within each session. This is extremely important since all subsequent analyses will derive from the transcripts you type.
2. You will have to differentiate the verbal activity of the child from that of the adult.
3. You will have to learn several rules concerning the designation of 'vocal response units' so that you can mark off responses on transcripts as you prepare them. You will also have to indicate whether each vocal response unit is a statement or a question.

Before discussing specific rules for marking off responses on the transcripts, I would like to present some general instructions for your consideration:

A. General Instructions:

1. Type the transcripts in the predetermined random order.
2. Differentiate verbalizations of the adult from those of the child by placing the identifying symbol (a) in the margin for adult verbalizations and (c) for remarks made by the child. (only the mothers' Language was transcribed in the present study).
3. Do not use capitals (except for proper names or for the pronoun "I"), commas, question marks, or any other form of punctuation in preparing these transcripts. You will use apostrophes, however, to indicate a contraction (I'm, he's) or to indicate possession (the aide's house).
4. Some of the remarks made by either the child or the adult will be completely or partially incomprehensible. This may be because the speaker was particularly soft-spoken, mumbled, had unintelligible speech, or because some noise obscured what the speaker was saying. If a response (to be defined later) is either partially or completely incomprehensible, exclude it from the transcript. Even if the response has only one incomprehensible word, leave out the entire response.

5. Sometimes the adult or the child will make some non-communicative noises during the session. For example, the adult may say, 'The dog goes bow-wow and the lion goes grr.' If, as in the above remark, the noise is an integral part of the response, type it in. If, however, the noise is not essential, omit it. For example the child may say, 'Bow-wow, here comes the dog.' In this instance omit the expression 'bow-wow.'
6. Interjections such as 'uh,' 'er,' should be omitted except when they are used as words. Examples:
- Give me the er book.
- Uh uh, you can't have it.
- The 'er' should be omitted.
- 'Uh uh,' meaning 'no' should be typed.
7. If the speaker starts but does not finish a word and you are quite sure what he was going to say, include the word, but place it between parentheses. For example:
- I th- i know he's coming.
- I (think) I know he's coming.
- If you can't tell what the started word was meant to be, simply exclude it.
- B. Designating 'vocal response units.' In this study we are concerned with the speech behavior of the adults and children rather than with how their responses would look on paper. We are preparing these transcripts as a convenience, but more basically we are concerned with how the individuals used speech

in the actual experimental sessions. We are not interested in whether or not a given response was grammatically complete and accurate. Rather we want to know whether it was functionally complete in terms of the ongoing exchange between the adults and the children. In normal conversation we don't always have a well defined predicate and nominative; and we indicate the beginning and end of our expressions by pauses, inflections, shifts in topics, etc., rather than by commas, periods, or exclamation points. That is why we have asked you not to put these punctuation marks in the transcripts you prepare. A little later I will describe the system you will use to indicate when a vocal response unit begins and ends. First, let us consider some of the rules that will help you decide when such a unit has occurred.

1. In general, a vocal response unit is a unit of spoken language marked off on either side by a pause or by some change in inflection.
2. A vocal response unit is considered finished when the speaker comes to a complete stop and allows his voice to fall.
3. A vocal response unit is considered finished when the speaker comes to a complete stop with either a questioning or exclamatory inflection.
4. A vocal response unit is considered finished when the speaker in some manner clearly indicates he does not intend to complete the remarks.

5. A vocal response unit is considered completed when one speaker terminates and the other begins speaking.
6. A vocal response unit may include several simple utterances. If one simple utterance or remark is immediately followed by another with no pause for breath, they are considered only one response unit if the second remark is clearly subsidiary to the first.
7. A vocal response unit may be a single word such as 'yes' or 'uh huh' or it may comprise many words such as, 'I'm going to the movies with my brother and sister and mother and father tomorrow if it doesn't rain.'
8. A single expression of affirmation ('yeah,' 'yep,' 'uh huh,' 'yes'), or of negation ('no,' 'nope,' 'nah,' 'naw'), or of interrogation ('huh,' 'what,' 'eh') may be complete responses. You are to determine by listening to the tape whether an utterance is simply a non-communicative grunt (see No. 9 below) or serves communicatively to indicate affirmation, negation, or interrogation. Examples:
 - (a) do you like me (one response)
 - (c) huh (one response)
 - (a) I said do you like me (one response)
 - (c) oh yeah (one response)
9. Expressions such as 'aw,' 'aah,' 'ow,' 'haha,' 'uh,' 'oop,' when they are not used as either affirmation, negation, or interrogation do not count as responses and should be omitted from the transcripts.

10. Utterances that are not recognizable as words or word approximations do not count as responses. Examples:
 - (a) what color is that (one response)
 - (c) pa (no response)
11. Occasionally the child and adult will be talking simultaneously. For example, the adult may start to speak and the child may interject a remark so that they are both talking at the same time. If this occurs, simply separate the response of the adult from that of the child on the transcript. That is, complete typing the adult responses and then indicate the child responses on the next line.

C. Differentiating Statements from Questions. All responses will be marked as either statements or questions. In normal conversation questions are typically indicated by the use of particular words, by the way the words are arranged in the response, or simply by inflection.

1. Occasionally a response may start out as a question but end as a statement. When this occurs, score the response a question. Examples:
 - (c) can I I'm going to eat my candy now
 - (a) would you like me to here let me help you with thatBoth of these examples would be scored as questions.
2. A response that starts out as a statement but ends as a question is also scored a question.

Examples:

(c) I think I'll do you think it is ok to tell the aide

(a) if I let you will you no I don't think I had better

D. Marking the Transcripts. You are to mark the responses in the following manner:

1. Indicate the beginning of a response by (a) underlining the first word and by (b) placing the number of the response above the first word. Number adult and child responses separately.
2. You will indicate the end of a response by placing either a single stroke (/) or a double stroke (//) after the last word.
 - (a) Use the single stroke (/) when the response is a statement.
 - (b) Use the double stroke (//) when the response is a question.
3. Even if the response unit consists of only one word, it is important to underline that word and follow it by the appropriate number of strokes.
4. Responses that contain words that are incomprehensible or for some other reason are excluded from the transcript will not be counted.
5. Don't forget, number adult and child responses separately. It is very important that you do not fail to indicate both the beginning and ending of each response and that you number the responses accurately." (pp. 100-102)

Parameters of investigations

A. Grammatical features. A modified version of Lee & Canter's (1971) estimation of syntactical development was used. Lee & Canter studied eight grammatical classifications; within each classification specific words or syntactical structures were grouped into levels of development. Thus level 1 contains syntactical structures that emerge in child language prior to the appearance of level 2 forms, which emerge prior to the level 3 forms and so on.

Thus the frequency of occurrence of the following levels in the mothers' language in each of the following linguistic parameters was investigated.

Parameter 1. Indefinite Pronouns or Noun Modifiers

Level

- 1 it, this, that
- 2 no, some, more, all, lot(s), one(s), two
(etc.), other(s), another
- 3 something, somebody, someone
- 4 nothing, nobody, no one, none
- 5 any, anything, anybody, anyone, every,
everyone, everything, everybody
- 6 both, few, many, each, several, most
least, much, next, first, last, second
(etc.)

Parameter 2. Personal Pronouns

Level

- 1 1st and 2nd person: I, me, my, mine,
you, your(s)

- 2 Third person: he, him, his, she, her,
hers
- 3 Plural pronouns: we, us, our(s), they,
them, their
- 4 those, these
- 5 Reflexive pronouns: myself, yourself,
himself, herself, itself, themselves
- 6 Wh-pronouns: who, which, whose, whom,
that, what, how many, how much:
- I know who came.
- That's what I said.
- Wh-word + infinitive:
- I know what to do.
- 7 (his) own, one, oneself, whichever,
whoever, whatever:
- Each has his own.
- Take whatever you like.

Parameter 3. Main verbs

Level

- 1 Uninflected verb: I see you.
Copula, is or 's: It's red.
- 2 is + verb + ing: He is coming.
- 3 -s and -ed: plays, played
Irregular past: ate, saw
Copula am, are, was, were: I am good.
You're good.

Auxiliary am, are, was, were:

I was going. We were going.

4 can, will, may + verb: may go

Obligatory do + verb: Don't go.

Emphatic do + verb: I do see.

5 could, would, should, or might + verb:

might come, could be

Obligatory does, did + verb

Emphatic does, did + verb

6 must, shall + verb: must come

have + verb + en: I've eaten.

have ('ve) got: I've got it.

7 Passive, any tense.

8 have been + verb + ing,

had been + verb + ing,

modal + have + verb + en: may have eaten,

modal + be + verb + ing: could be playing

Other auxiliary combinations: should have

been sleeping

Parameter 4. Secondary verbs.

Level

1 Five early-developing infinitival complements:

I wanna see (want to see).

I'm gonna see (going to see).

I've gotta see (got to see).

Lemme [to] see (let me [to] see).

Let's [to] play (let [us to] play).

2 Noncomplementing infinitives:

I stopped to play.

I'm afraid to look.

3 Participle, present or past:

I see a boy running.

I found the toy broken.

4 Early infinitival complements with differing subjects in kernels:

I want you to come.

Let him [to] see.

Later infinitival complements:

I had to go. I told him to go.

I tried to go. I asked you to go.

Obligatory deletions:

Make it [to] go.

I'd better [to] go.

Infinitive with wh-word:

I know what to get.

I know how to do it.

5 Passive infinitival complement:

I have to get dressed.

I want to be pulled.

6 Gerund:

Swinging is fun.

I like fishing.

He started laughing.

Parameter 5. Negatives

Level

1 it, this, that + copula or auxiliary is,

's + not:

It's not mine.

This is not a dog.

That is not moving.

2 can't, don't

3 isn't, won't

4 Any copula-negative or auxiliary-negative
contractions, other than #1, 2, 3, or 5:

They aren't here.

I couldn't go.

Any pronoun-auxiliary contraction + not,
other than #1 or 5:

You're not going.

He's not here.

I'm not sure.

Any uncontracted negatives, other than
#1 or 5:

I can not go.

I should not go.

5 Negatives with have: Uncontracted negative:

I have not eaten it.

Auxiliary have-negative contraction:

I hadn't eaten it.

Pronoun-auxiliary have contraction:

I've not eaten it.

Parameter 6. Conjunctions

Level

1 and

2 but

3 because

4 so, and so, so that, if

5 or, except, only

6 where, when, while, why, how, whether (or not),
for, till, until, since, before, after, unless,
as, as + adjective + as, as if, like, that,
than

I know where you are.

I see why you want it.

Don't come till I call.

Go before he sees you.

Obligatory deletions (score 6):

I can run faster than you [can run].

I am as big as a man [is big].

Optional deletions (score 0):

She was hungry, that's why [she ate it].

Wh-words + infinitive:

I know how to do it.

I know where to go.

7 therefore, however, whenever, wherever, etc.

Parameter 7. Interrogative Reversals

Level

1 Reversal of copula:

Is it red?Isn't it red?Were they there?

2 Reversal of auxiliary be:

Is he coming?Isn't he coming?

3 Obligatory do, does, did:

Do they run?Does it bite?Didn't it hurt?

Reversal of modal:

Can you play?Won't they come?Shall I sit down?

Tag question:

It is fun, isn't it?It isn't fun, is it?He has gone, hasn't he?He hasn't gone, has he?

4 Reversal of auxiliary have:

Has he seen you?

Reversal with any two auxiliaries:

Has he been eating?

Can he be sleeping?

Couldn't he have gone?

5 Reversal with three auxiliaries:

Could he have been going?

Wouldn't he have been sleeping?

Parameter 8. Wh Questions

Level

1 who, what, what + noun:

What do you want?

Who is there?

What is coming?

What book are you reading?

2 where, how many, how much, what.....

do, what... for:

Where is he?

How many do you want?

How much do you want?

What are you doing?

What is a hammer for?

3 when, how, how + adjective:

When shall I come?

How do you do it?

How big is it?

4 why, what if, how come, how about + gerund:

Why are you crying?

What if I won't do it?

How come he is crying?

How about coming with me?

5 whose, which, which + noun:

Whose car is that?

Which do you want?

Which book do you want?

B. Sentential Structure. The frequency of occurrence of the following sentential structures was investigated:

Parameter 9. Single word sentences

Parameter 10. Imperative sentences

Parameter 11. Declarative sentences

Parameter 12. Grammatically incomplete sentences

Parameter 13. Questions

Parameter 14. Raised intonation questions

C. Vocabulary

Parameter 15. T.T.R. (Type Token Ratio: the different words' ratio among all words).

D. Productivity

Parameter 16. Total words

Parameter 17. Total verbal responses (same as Schiefelbusch's vocal responses)

Parameter 18. Mean length of verbal responses

Parameter 19. Total sentences

Parameter 20. Mean length of sentences

Parameter 21. Word rate per minute

Results

Tables 1 through 6 present the frequency of occurrence of the various levels of the first six parameters in the mother's language in all three situations. This information is extracted from 100 randomly selected verbal responses from each group of mothers in each of the three situations. Table 1 should be read as follows: Indefinite pronoun; mothers of normal children produced 49 Indefinite pronouns of the level 1 order in the play situation (A), 40 Indefinite pronouns of the level 1 order in the table setting I situation (B), and 46 Indefinite pronouns of the level 1 order in the Table setting II situation (C). Similarly, mothers of Down's produced 26 Indefinite pronouns of the level 1 order in the play situation (A), 31 Indefinite pronouns of the level 1 order in the table setting I situation (B), and 27 Indefinite pronouns of the level 1 order in the table setting II situation (C).

Tables 10 through 51 (Appendix A) present the frequency of occurrence of the various levels in the following parameters: Indefinite pronouns, Personal pronouns, Main verbs, Secondary verbs, Negatives, Conjunctions and Wh questions. This information is extracted from all verbal responses of each mother in the three situations. Table 10 should be read as follows: The mother of normal child I (MNI) had produced 2 indefinite pronouns of the level 1 order in the play situation and zero indefinite pronouns of levels 2 through 5. MN2 produced 27 indefinite pronouns of the level 1 order in the play situation, 1 indefinite pronoun of the level 2 order and no indefinite pronouns of levels 3 through 6.

Table 1
The Frequency of Occurrence of the Various Levels of the
Indefinite Pronoun Parameter¹

Indefinite Pronoun						
Levels	Mothers of Normals			Mothers of Down's		
	Situations			Situations		
	A	B	C	A	B	C
1	49	40	46	26	31	27
2	3	1	2	1	1	0
3	0	1	3	0	0	0
4	0	0	0	0	0	0
5	0	0	0	0	0	0
6	0	0	0	0	0	0

¹This information is extracted from 100 randomly selected verbal responses from each group in each of the three situations.

Table 2
The Frequency of Occurrence of the Various Levels of the
Personal Pronoun Parameter¹

Personal Pronoun						
Levels	Mothers of Normals			Mothers of Down's		
	Situations			Situations		
	A	B	C	A	B	C
1	12	8	12	9	12	21
2	6	0	0	6	1	0
3	1	4	5	2	7	4
4	0	0	1	0	0	0
5	0	0	3	0	0	1
6	0	0	0	1	0	0
7	0	0	0	1	0	0

¹This information is extracted from 100 randomly selected verbal responses from each group in each of the three situations.

Table 3
The Frequency of Occurrence of the Various Levels of the
Main Verb Parameter¹

Levels	Main Verb					
	Mothers of Normals			Mothers of Down's		
	Situations			Situations		
	A	B	C	A	B	C
1	62	45	57	63	48	57
2	0	1	0	0	1	0
3	8	19	14	4	5	6
4	2	5	10	1	2	5
5	0	0	1	0	0	0
6	1	0	0	1	0	0
7	0	0	0	0	0	0
8	0	0	0	0	0	0

¹This information is extracted from 100 randomly selected verbal responses from each group in each of the three situations.

Table 4
The Frequency of Occurrence of the Various Levels
Secondary Verb Parameter¹

Secondary Verb						
Levels	Mothers of Normals			Mothers of Down's		
	Situations			Situations		
	A	B	C	A	B	C
1	0	0	1	0	2	0
2	0	5	3	0	1	1
3	1	0	0	0	0	0
4	6	0	0	0	0	0
5	0	0	0	0	0	0
6	0	0	0	0	0	1

¹This information is extracted from 100 randomly selected verbal responses from each group in each of the three situations.

Table 5
The Frequency of Occurrence of the Various Levels of the
Negatives Parameter¹

Levels	Negatives					
	Mothers of Normals			Mothers of Down's		
	Situations			Situations		
	A	B	C	A	B	C
1	0	0	0	1	0	0
2	0	0	2	2	2	2
3	1	0	0	0	0	0
4	0	0	1	0	0	1
5	1	0	0	0	0	0

¹This information is extracted from 100 randomly selected verbal responses from each group in each of the three situations.

Table 6
The Frequency of Occurrence of the Various Levels of the
Conjunctions Parameter¹

Conjunctions						
Levels	Mothers of Normals			Mothers of Down's		
	Situations			Situations		
	A	B	C	A	B	C
1	4	24	14	0	4	5
2	0	1	0	0	0	0
3	0	0	0	0	0	0
4	1	2	0	0	0	0
5	0	0	1	0	0	0
6	2	2	1	0	3	0

¹This information is extracted from 100 randomly selected verbal responses from each group in each of the three situations.

Table 7

The Mean Standard Deviation and t Score of Each Linguistic Parameter in the Language of the Mothers in the Play Situation

Linguistic Parameter	Mothers of Normals		Mothers of Down's		t
	\bar{X}	S.D.	\bar{X}	S.D.	
1. ¹ Indefinite Pronoun	10.4	10.5	5.0	1.2	1.13
2. ¹ Personal Pronoun	3.8	2.2	2.8	3.0	.56
3. ¹ Main Verb	14.6	10.2	11.5	3.5	.63
4. ¹ Second Verb	1.4	2.6	NA	NA	NA
5. ¹ Negatives	.40	.54	.50	.54	.26
6. ¹ Conjunctions	1.4	1.1	NA	NA	NA
7. Interrogative Reversals	7.4	6.0	6.1	3.1	.41
8. Wh Questions	6.4	2.0	2.8	3.7	1.76
9. Single Word Sentences	4.6	1.5	5.8	2.7	.80
10. Imperative Sentences	7.4	6.6	14.	8.9	1.24
11. Declarative Sentences	5.2	3.5	6.3	4.5	.40
12. Grammatically Incomplete Sentences	8.0	4.6	10.1	1.4	.95
13. Questions	15.2	7.5	11.6	3.8	.92
14. Raised Intonation Questions	1.4	.54	2.6	2.5	.95
15. T.T.R. Type Token Ratio	.58	.08	.53	.09	.88
16. Total Words	140	79.6	141.	39.4	.02
17. Total Verbal Response	32	14.6	40.	9.4	.99
18. Mean Length of Verbal Response	4.2	1.0	3.5	.38	1.4
19. Total Sentences	36	17.8	40.8	9.9	.51
20. Mean Length of Sentences	3.9	1.1	3.4	.33	.95
21. Word Rate Per Minute	140	79.6	141.	39.4	.02

¹Per 100 verbal responses from each group
NA - Non-applicable

Table 8

The Mean Standard Deviation and t Score of Each Linguistic Parameter in the Language of the Mothers in the Table Setting I Situation

Linguistic Parameter	Mothers of Normals		Mothers of Down's		t
	\bar{X}	S.D.	\bar{X}	S.D.	
1. ¹ Indefinite Pronoun	8.4	4.9	5.3	4.3	1.0
2. ¹ Personal Pronoun	2.4	2.6	3.3	1.0	.70
3. ¹ Main Verb	14.	9.7	9.3	3.5	.99
4. ¹ Second Verb	1.	1.	.5	.8	.83
5. ¹ Negatives	NA	NA	.33	.51	NA
6. ¹ Conjunctions	5.8	4.5	NA	NA	NA
7. Interrogative Reversals	2.6	1.8	3.1	2.8	.34
8. Wh Questions	3.0	2.6	1.3	1.5	1.22
9. Single Word Sentences	6.	2.5	14.6	4.3	3.57*
10. Imperative Sentences	8.8	7.4	19.8	9.1	1.96*
11. Declarative Sentences	9.4	7.0	8.5	4.7	.22
12. Grammatically Incomplete Sentences	12.4	5.1	22.8	8.5	2.17*
13. Questions	8.0	5.0	8.5	4.8	.15
14. Raised Intonation Questions	2.4	1.9	4.0	4.8	.63
15. T.T.R. Type Token Ratio	.38	.07	.40	.09	.37
16. Total Words	181	68.1	194	70.	.28
17. Total Verbal Response	37	8.7	57	16.3	2.23*
18. Mean Length of Verbal Response	4.8	1.28	3.3	.35	2.50*
19. Total Sentences	37.6	10.4	58	17.4	2.1*
20. Mean Length of Sentences	4.78	1.15	3.25	.35	2.82*
21. Word Rate Per Minute	NA	NA	NA	NA	NA

¹ per 100 verbal responses from each group

* $p < .05$

** $p < .01$

NA - non applicable

Table 9

The Mean Standard Deviation and t Score of Each Linguistic Parameter in the Language of the Mothers in the Table Setting II Situation

Linguistic Parameter	Mothers of Normals		Mothers of Down's		t
	\bar{X}	S.D.	\bar{X}	S.D.	
1. ¹ Indefinite Pronoun	10.4	3.7	4.5	2.4	2.82*
2. ¹ Personal Pronoun	4.4	3.6	4.3	4.5	.03
3. ¹ Main Verb	16.4	3.6	11.6	4.8	1.66
4. ¹ Second Verb	.80	.83	.33	.51	1.0
5. ¹ Negatives	.60	.89	.50	.54	.20
6. ¹ Conjunctions	3.2	2.0	.83	.75	2.42*
7. Interrogative Reversals	5.6	2.5	5.8	8.5	.04
8. Wh Questions	7.4	5.8	.83	.98	2.43*
9. Single Word Sentences	8.4	3.0	12.6	3.3	1.98*
10. Imperative Sentences	10.2	10.6	23.8	9.3	2.04*
11. Declarative Sentences	10.8	5.0	8.1	4.6	.84
12. Grammatically Incomplete Sentences	12.2	6.5	22.	3.7	2.85*
13. Questions	14.4	4.2	9.5	8.89	1.0
14. Raised Intonation Questions	1.4	.89	2.8	3.18	.86
15. T.T.R. Type Token Ratio	.39	.11	.37	.09	.29
16. Total Words	240	83.	204	65	.72
17. Total Verbal Response	45	12.8	58.6	6.1	2.08*
18. Mean Length of Verbal Response	5.3	1.0	3.4	.30	4.0*
19. Total Sentences	47.4	14.7	62	8.99	1.8*
20. Mean Length of Sentences	5.1	.93	3.2	.62	3.5*
21. Word Rate Per Minute	NA	NA	NA	NA	NA

¹ per 100 verbal responses

* $p < .05$

* $p < .01$

NA - non-applicable

Figure 2. The Mean Frequency of Occurrence of Indefinite Pronouns in Both Groups of Mothers in the Three Situations.

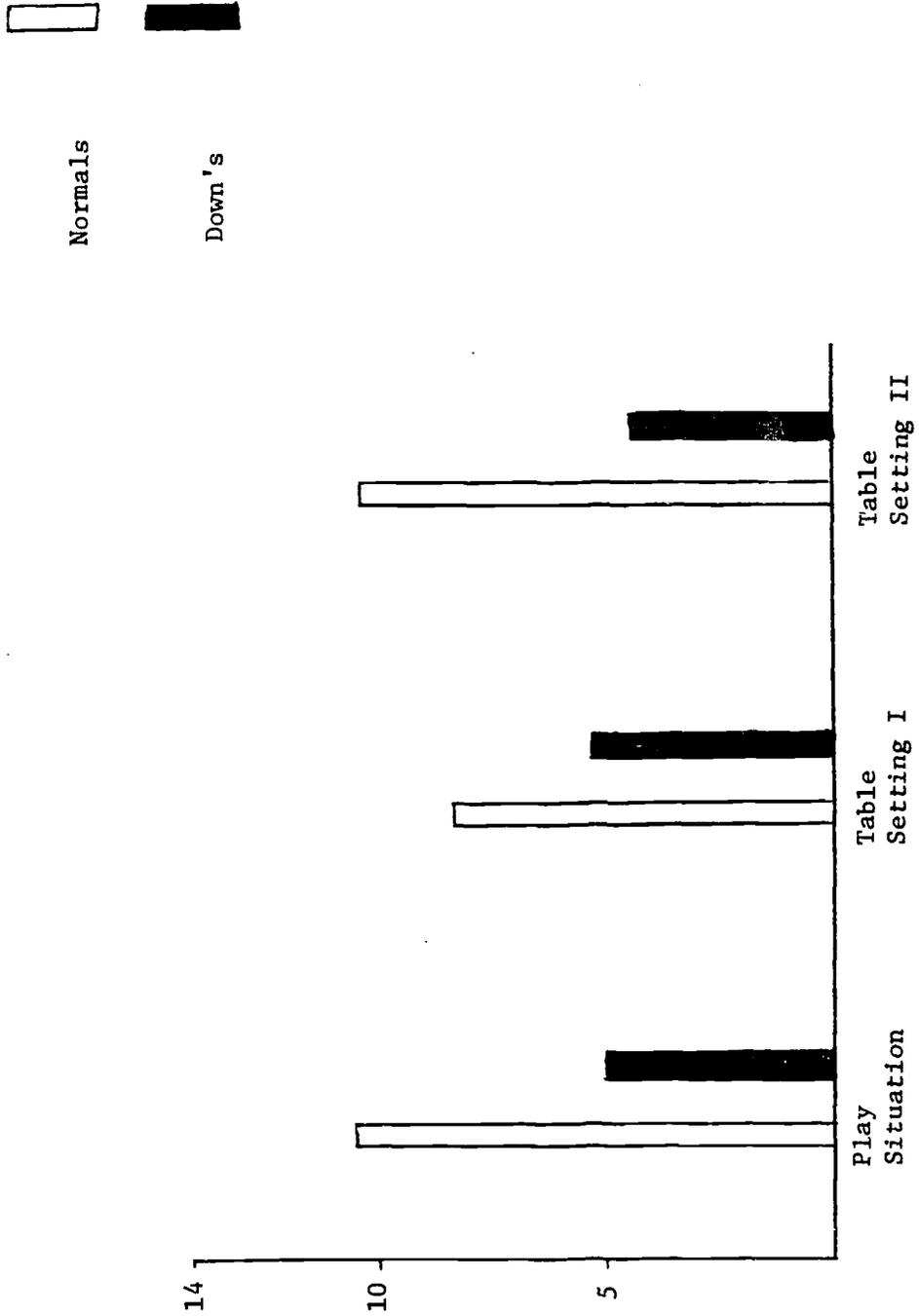


Figure 3. The Mean Frequency of Occurrence of Conjunctions in Both Groups of Mothers in the Three Situations.

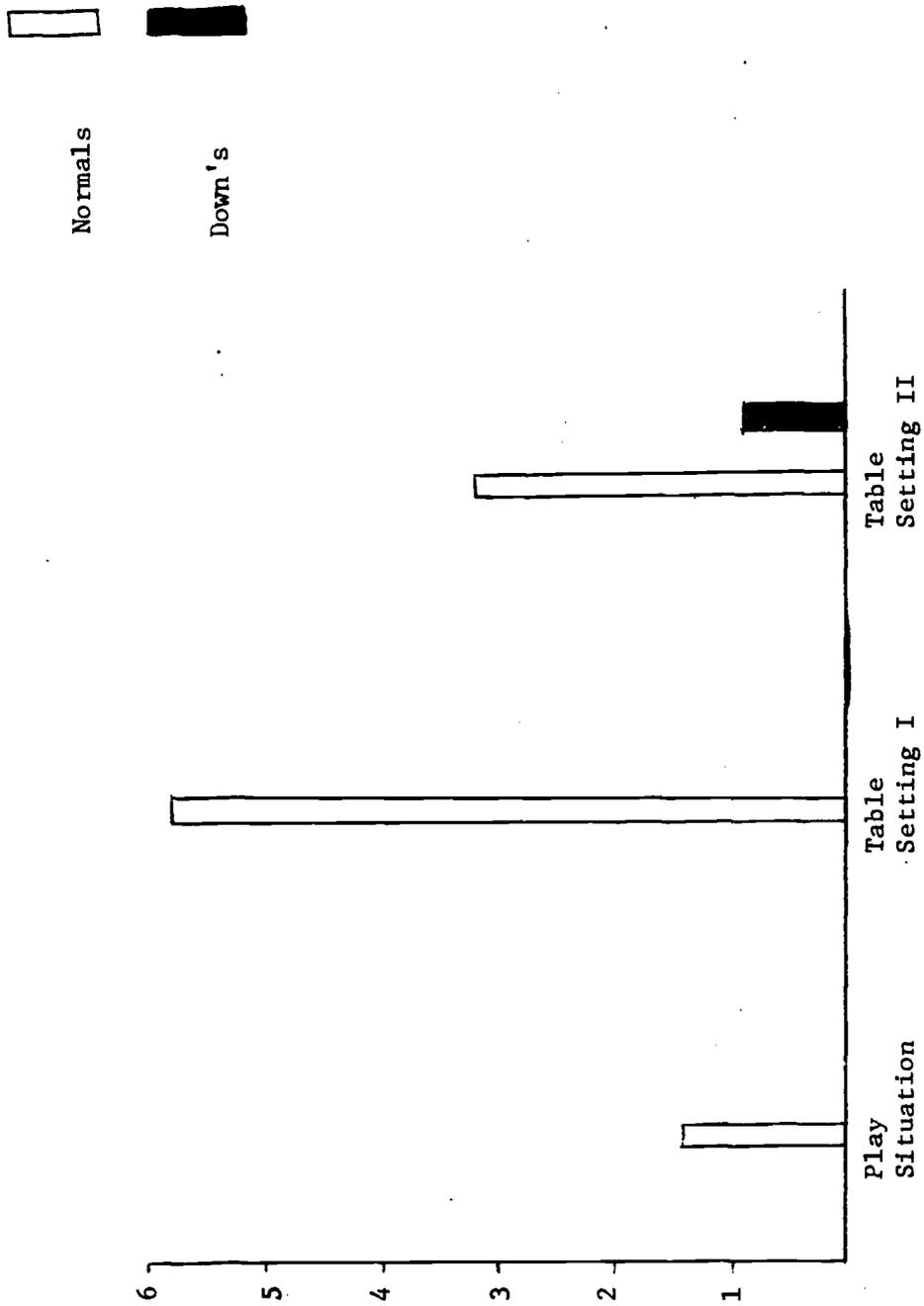


Figure 4. The Mean Frequency of Occurrence of Wh Questions in Both Groups of Mothers in the Three Situations.

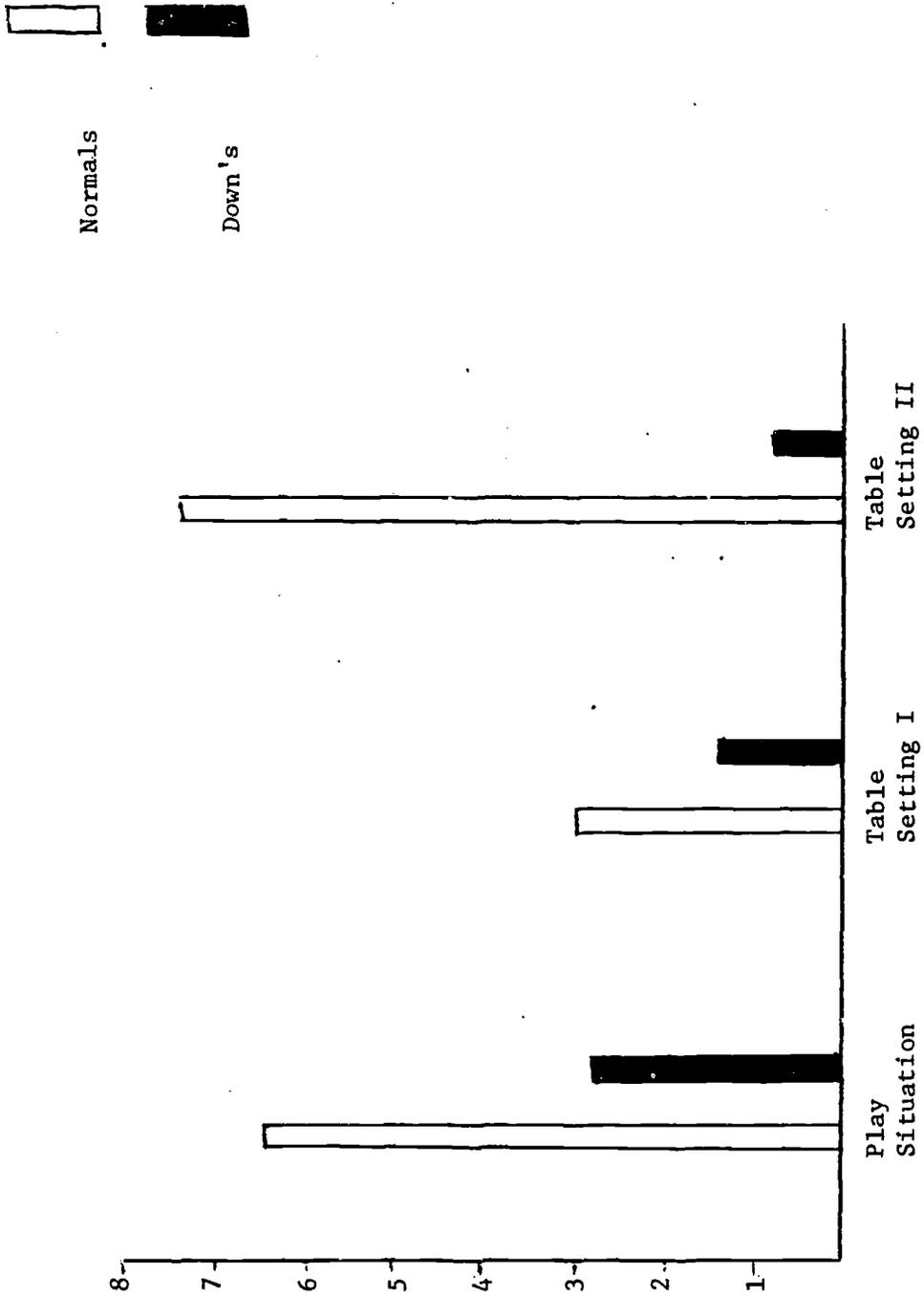


Figure 5. The Mean Frequency of Occurrence of Single Word Sentences in Both Groups of Mothers in the Three Situations.

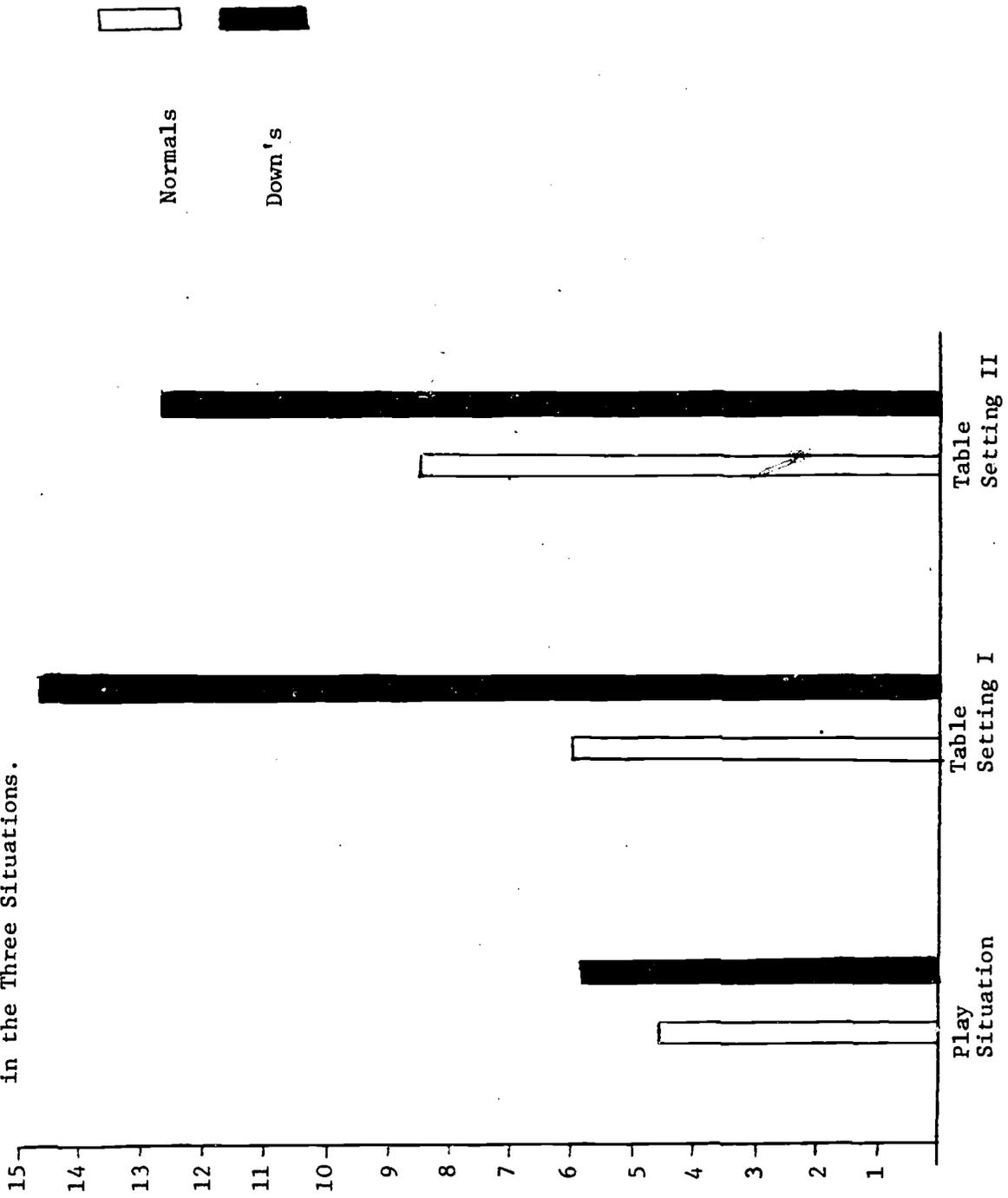


Figure 6. The Mean Frequency of Occurrence of Imperative Sentences in Both Groups of Mothers in the Three Situations.

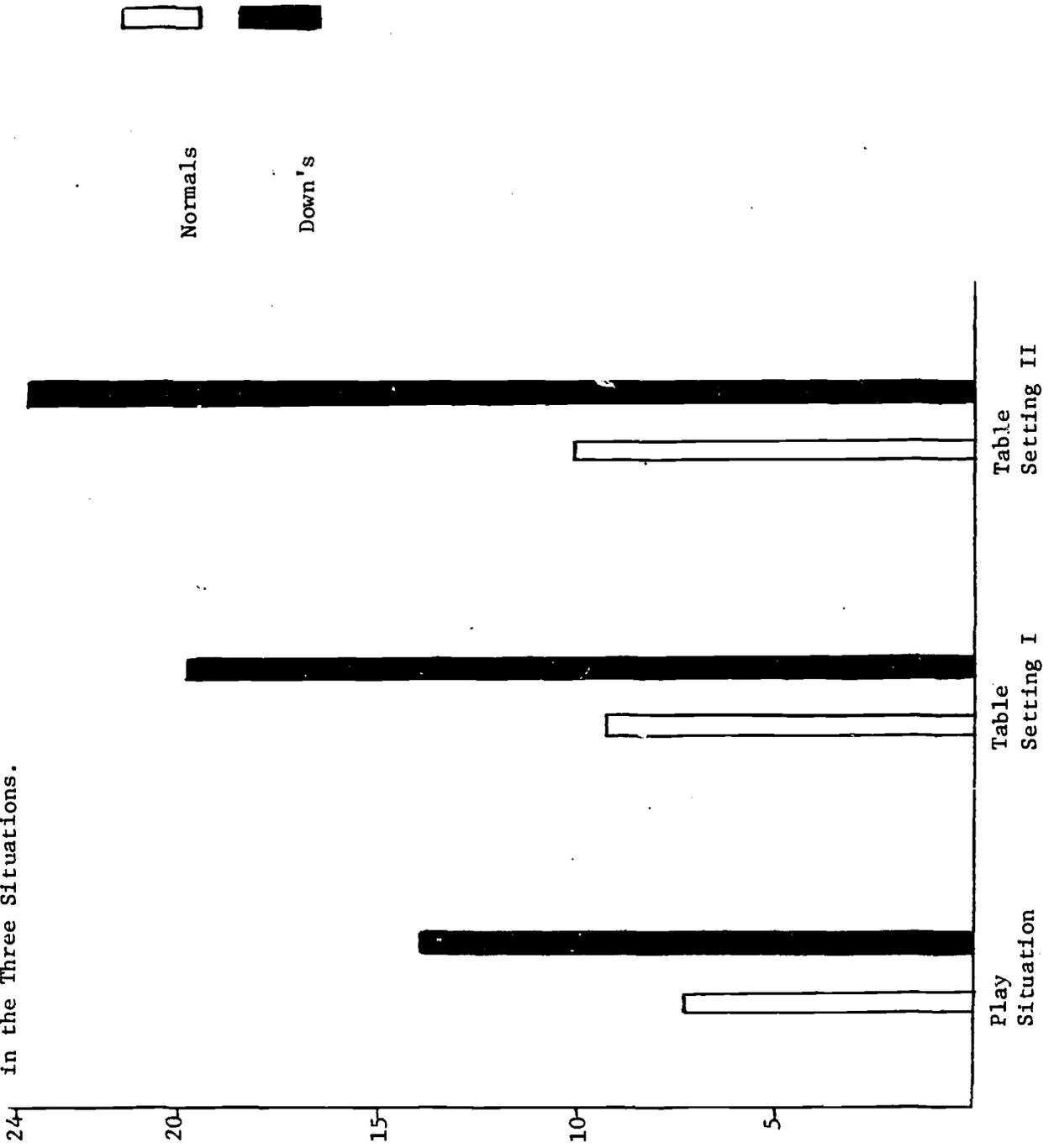


Figure 7. The Mean Frequency of Occurrence of Grammatically Incomplete Sentences in Both Groups of Mothers in the Three Situations.

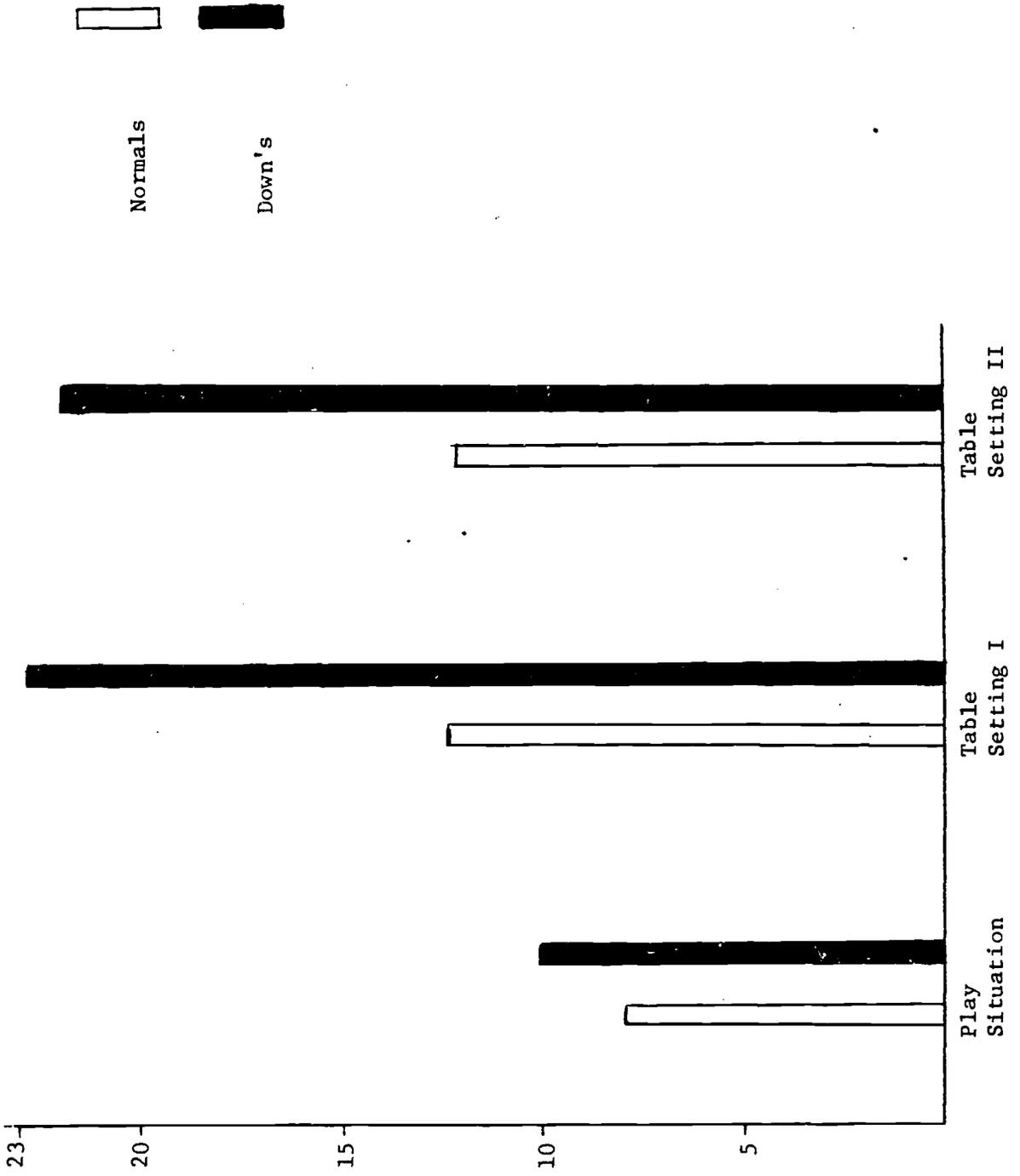


Figure 8. The Mean Frequency of Occurrence of Total Verbal Responses in Both Groups of Mothers in the Three Situations.

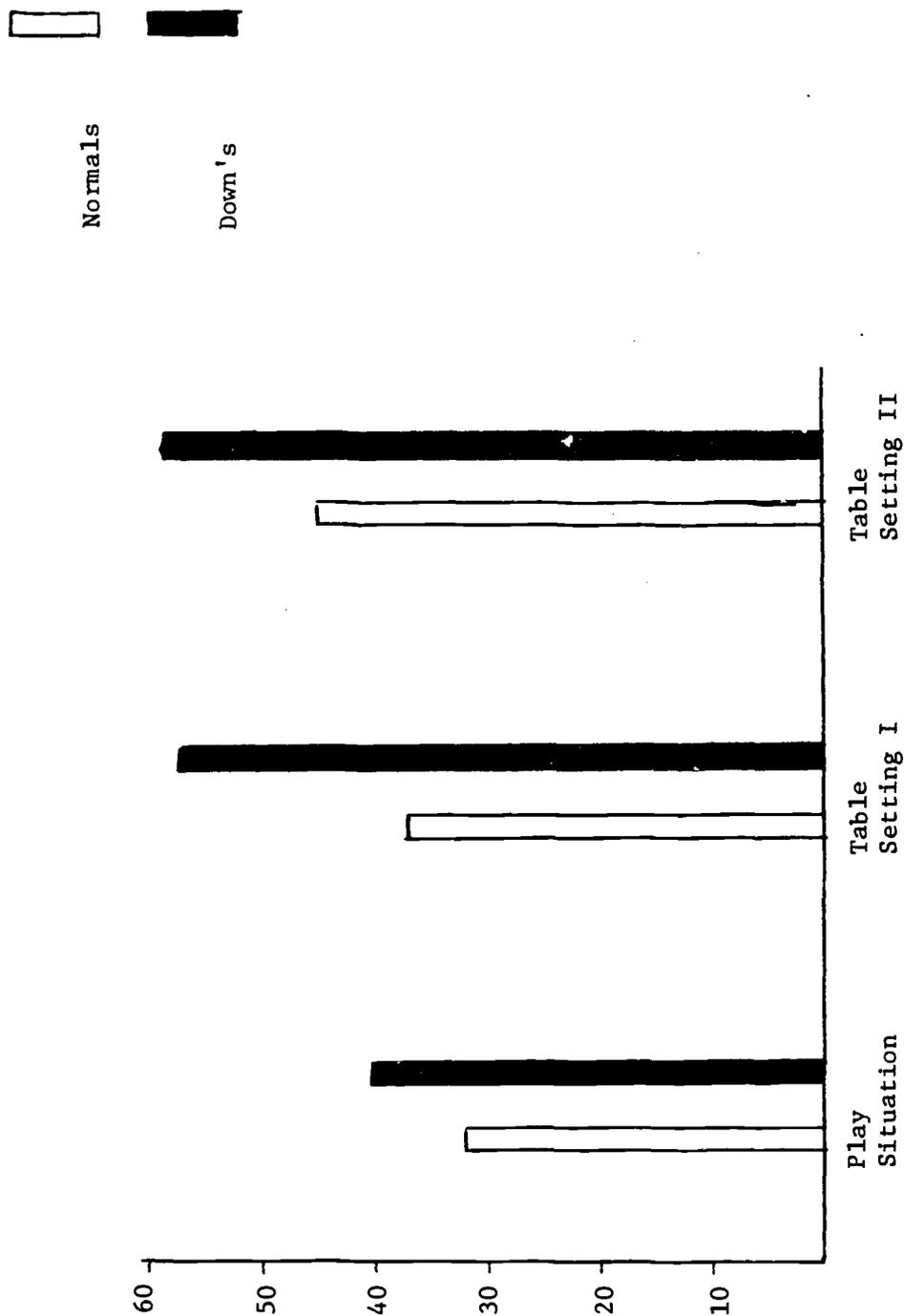


Figure 9. The Mean Frequency of Occurrence of Mean Length of Verbal Responses in Both Groups of Mothers in the Three Situations.

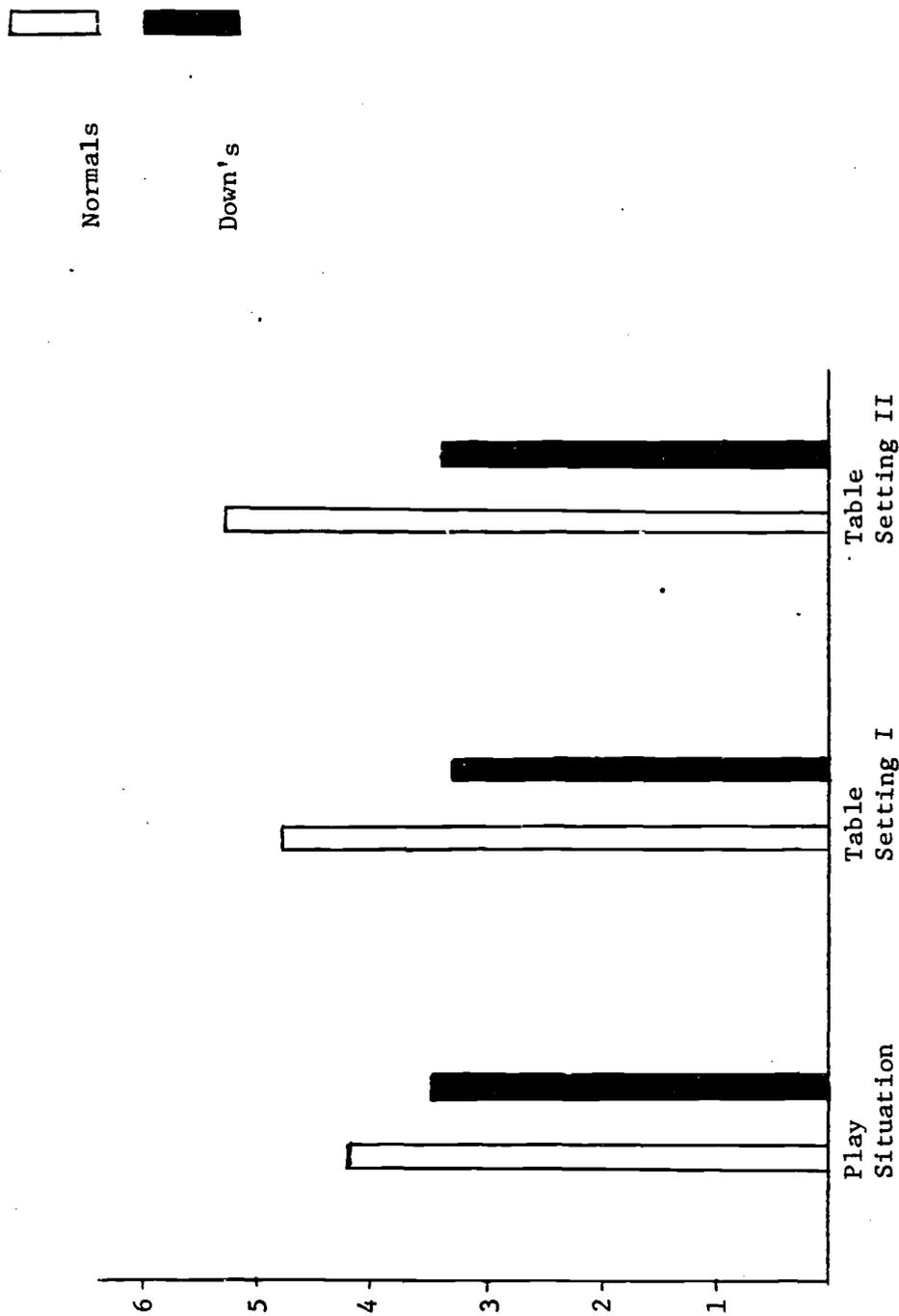


Figure 10. The Mean Frequency of Occurrence of Total Sentences in Both Groups of Mothers in the Three Situations.

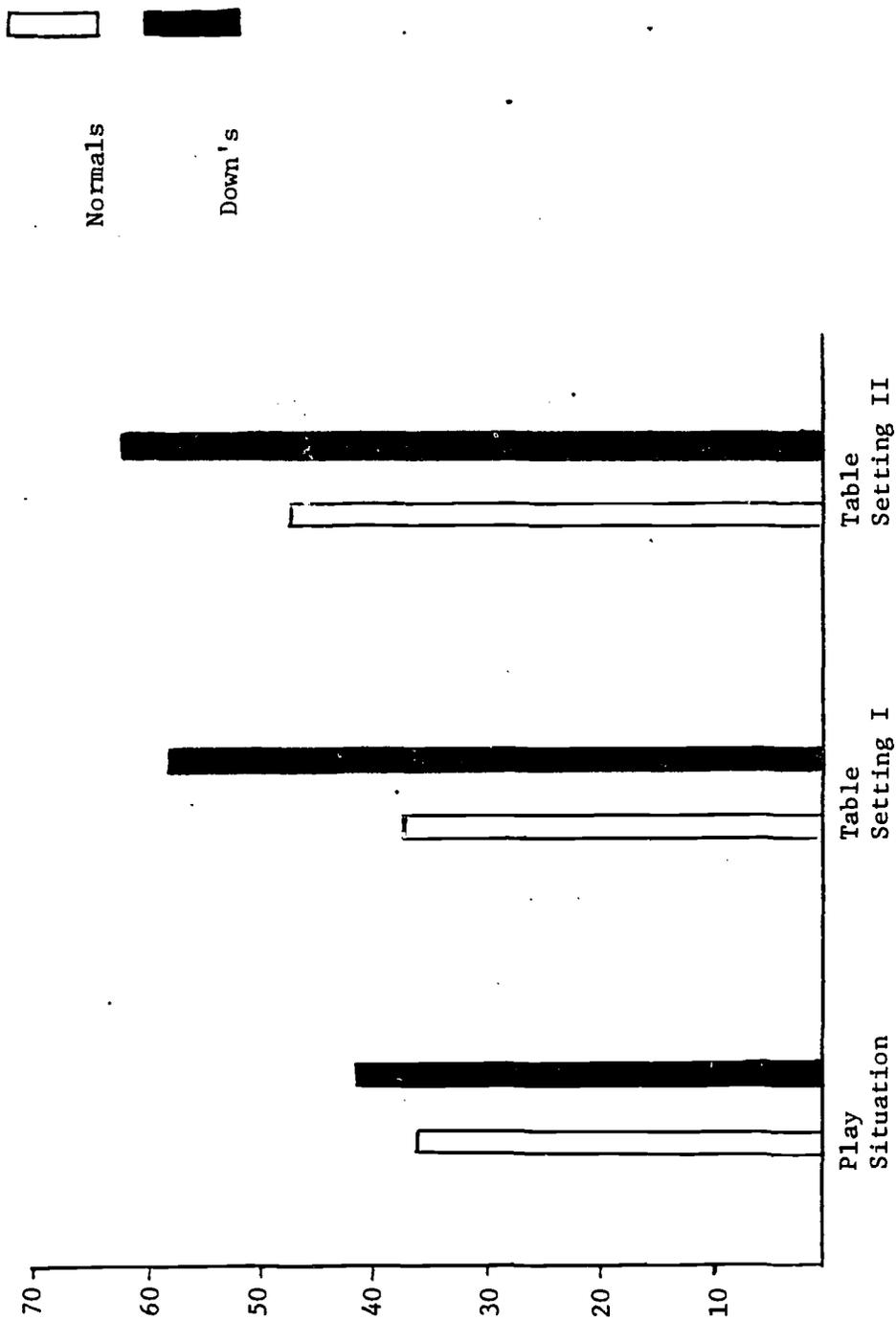
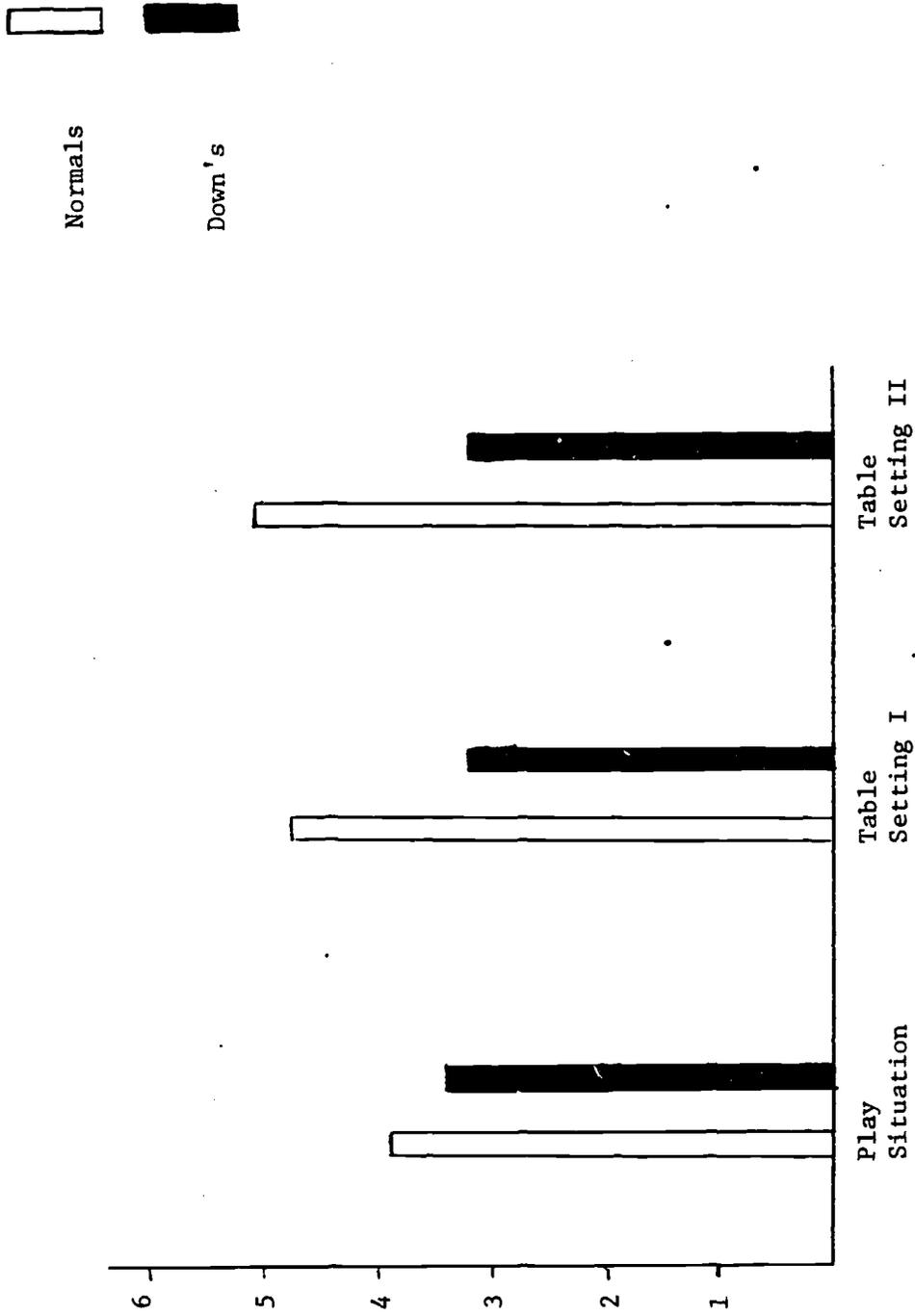


Figure 11. The Mean Frequency of Occurrence of Sentence Length in Both Groups of Mothers in the Three Situations.



Tables 52 through 77 (in Appendix A) present the frequency of occurrence of the following parameters in the mothers' language: Interrogative reversals, Raised intonation questions, single word sentences, Imperative sentences, Declarative sentences, Grammatically incomplete sentences, the T.T.R., total words, total verbal responses, total sentences, the mean length of verbal responses and mean length of sentences.

Figure 2 through 11 present the 10 linguistic parameters which differed significantly in the language of the two groups of mothers.

Appendix B consists of a protocol of one of the mothers' language in all three situations. For convenience all non-question verbal responses of the mother in each situation appear first marked by a single stroke (/), followed by all the mother's questions marked by a double stroke (//).

Discussion and Conclusions

Inspection of all mothers' syntactical structures within each of the grammatical features (parameters 1 through 6 in Tables 1-6) revealed that mothers produce many of the structures that other investigators (Lee & Canter, 1971; Chomsky, 1957; Cazden, 1968; Miller & Errin, 1964; Klima & Bellugi, 1966; Bloom, 1970; and Brown, 1968) have found to emerge earlier than others in the child's language. Within each of the first six linguistic Parameters (Tables 1 through 6) the vast majority of the structures used by mothers tended to fall within the first two levels. For instance, Level I of the indefinite pronoun classification was suggested by Lee & Canter to contain the early Pivot words IT, THIS and THAT. Inspecting the various forms of

the indefinite pronouns used by the mothers in all three situations, it appears that well over 95% of them were either IT, THIS or THAT, i.e., they fall within the first developmental level. Further inspection of each of the classifications in Tables 1-6 reveals that with the exception of secondary verbs, the higher the level, i.e., the later in the child's language development it occurs, the less often it is produced by the mothers.

Why mothers produce certain forms in each classification more often than others is a question worthy of an empirical investigation. One reason might be the young age of the children (24 months). Perhaps mothers would use more of the later developing levels with older children. Although this is feasible, an alternative may be advanced (they need not be mutually exclusive): Certain grammatical forms in each classification are used more frequently in the English language than other forms (Brown, 1970). If children hear a given form more often, it is likely to be used by them sooner (Brown, 1970). Thus, what may affect the child's order of language acquisition, among other factors, is the frequency with which certain grammatical forms are used in the English language. In providing the child with the linguistic information necessary for his language construction, the mother's language may also reflect a species-specific biological based cognitive imposition on language (Lenneberg, 1967), i.e., such that certain linguistic forms occur more frequently in the language than others. Do these forms in fact reflect more basic and predominant biological-cognitive propensities in the service of language? This will become the target of subsequent research.

Close inspection of Tables 7-9 reveals that the frequencies of occurrence of some linguistic parameters in certain situations are significantly different in the two groups. These differences can be summarized as follows: The Down's Syndrome children were exposed to a higher number of verbal responses yet to a lower mean length of verbal response; to a higher number of sentences, yet to a lower mean length of sentences; they were exposed to a higher frequency of grammatically incomplete sentences, imperative sentences and single word responses. On the other hand, they were exposed to a lower frequency of indefinite pronouns, conjunctions, Wh type questions, and the grammatical forms that are associated with levels 3 and 4 of the main verb classification: present and past tense markers; irregular past forms; copula and auxiliary am, are, was, were; can will, may + verb; obligatory do + verb and emphatic do + verb.

Whether there are other linguistic parameters which may vary significantly in some respects in the Down's Syndrome child's early linguistic environment, or whether the present 21 parameters may be found to appear with differing frequency in other verbal situations, are matters for empirical investigation. At this time it can be stated that in some verbal situations certain parameters of the linguistic input to the Down's children are different in terms of frequency of occurrence. Within the current theory of language development the above can be restated as follows: The Down's children's LAD must operate on linguistic data that is somewhat different than the data provided to normal children. Given the cognitive skills differences between Down's and normals, the fact still remains that both groups

are exposed to linguistic data with differing signal construction. By no means is it intended to minimize the possible role of the child's own cognitive skills "to break" the incoming linguistic code. We are merely pointing out that the linguistic environment of Down's Syndrome children is different, and, therefore, is worthy of careful consideration in any attempt to understand their language acquisition process.

The extent to which the early language environment is related to later characteristics of the language of retarded children in general is an empirical question. If such a relationship is assumed, one may expect to find corresponding parameters in retarded children's language to differ in some aspects, including the frequency of occurrence, from the same parameters of normal language users. The following are some of the published findings regarding later characteristics of mentally retarded deviant language users:

(1) Menyuk (1964): more often than normals deviant speakers tend to produce grammatically incomplete sentences (morphological and syntactical omissions).

(2) Menyuk (1969): deviant speakers use deviant forms of Wh type questions.

(3) Leonard (1972): (a) deviant speakers use indefinite pronouns, personal pronouns, main verbs and secondary verbs with a lower frequency than their normal peers; (b) deviant speakers use grammatically incomplete sentences more often.

(4) Newfield and Schlanger (1968): Retarded children have third person singular verb errors that could not be attributed merely to intellectual immaturity.

When such children are identified as deviant language users, usually between their 3rd and 4th birthday, it is too late to collect information on the nature of the early linguistic experiences they might have had. Thus, we have reversed the order: we look at the kind of linguistic environment experienced by children who in all likelihood will become normal speakers as well as the linguistic experiences of those that in all likelihood will become deviant language users. At the present we are following up the language characteristics of the mothers as they continue to interact with their children, as well as making weekly tapings of Down's children's productive language.

The information gathered in the present study regarding the group of parameters in the mothers' language which are different in terms of frequency of occurrence will be contrasted with the same parameters in the Down's Syndrome children's language as it becomes available.

A word of caution: generalization, based on the present data, to the total population of Down's Syndrome individuals, or to the retarded populations, would be inappropriate because Ss in the study were screened on selected variables at the time of inclusion.

REFERENCES

- Bloom, L. Language development: Form and function in emerging grammars. Cambridge, Mass.: MIT, 1970.
- Broen, P. The verbal environment of the language learning child. American Speech & Hearing Association Monograph, No. 17, 1973.
- Brown, R. The development of WH-questions in child speech. Journal of Verbal Learning and Verbal Behavior, 7, 1968.
- Brown, R. Derivational complexity and order of acquisition in child speech. In J. R. Hayes (Ed.), Cognition and the development of language. New York: John Wiley & Sons, 1970.
- Buium, N. An investigation of the word order parameter of a parent child verbal interaction in a relatively free word order language. Language and Speech, in press.
- Cazden, C. The acquisition of noun and verb inflections. Child Development, 39, 1968.
- Chomsky, N. Syntactic structures. The Hague: Mouton, 1957.
- Chomsky, N. Aspects of the theory of syntax. Cambridge: MIT Press, 1965.
- Chomsky, N. Language and mind. New York: Harcourt Brace Jovanovich, Inc., 1968.
- Chomsky, N., & Miller, G. A. Introduction to the formal analysis of natural languages. In R. D. Luce, R. R. Bush & E. Glanter (Eds.), Handbook of mathematical psychology, Vol. 2. New York: John Wiley & Sons, 1963.
- Klima, E., & Bellugi, U. Syntactic regularities in the speech of children. In J. Lyons and R. J. Wales (Eds.), Psycholinguistics papers. Edinburgh: Edinburgh University, 1966.
- Lee, L. L., & Canter, S. M. Developmental sentence scoring: A clinical procedure for estimating syntactic development in children's spontaneous speech. Journal of Speech & Hearing Disorders, No. 3, 36, 1971.
- Lenneberg, E. G. Biological foundations of language. John Wiley & Sons, 1967.
- Lenneberg, E. H. On explaining language. Science, 1969, 164, 3880.

- Leonard, L. B. What is deviant language? Journal of Speech and Hearing Research, No. 4, 37, 1972.
- McNeill, D. A. The acquisition of language: The study of developmental psycholinguistics. New York: Harper & Row, 1970.
- Menyuk, P. Comparison of grammar of children with functionally deviant and normal speech. Journal of Speech and Hearing Research, 1964, 7.
- Menyuk, P. Sentences children use. Cambridge, Mass.: MIT Press, 1969.
- 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.
- Schielfelbusch, R. Language studies of MR children. Journal of Speech and Hearing Research Monograph, 1963, 10.
- Slobin, D. Psycholinguistics. Scott, Foresman and Company, 1971.
- Snow, C. E. Mother's speech to children learning language. Child Development, 1972, 43.

APPENDIX A

Individual Data Analysis

Table 1⁰

The Frequency of Occurrence of the Various Indefinite Pronoun Levels
in the Language of Mothers of Normals' in the Play Situation.

Mothers of Normals	Indefinite Pronoun Levels					
	1	2	3	4	5	6
MN 1	2	0	0	0	0	0
MN 2	27	1	0	0	0	0
MN 3	6	2	0	0	0	0
MN 4	3	0	0	0	0	0
MN 5	11	0	0	0	0	0

Table 11

The Frequency of Occurrence of the Various Indefinite Pronoun Levels
in the Mothers of Down's Language in the Play Situation.

Mothers of Down's	Indefinite Pronoun Levels					
	1	2	3	4	5	6
MD 1	20	0	0	0	0	0
MD 2	4	0	0	0	0	0
MD 3	9	0	0	0	0	0
MD 4	6	3	3	0	0	0
MD 5	5	1	0	0	0	0
MD 6	9	0	0	0	0	0

Table 12

The Frequency of Occurrence of the Various Indefinite Pronoun Levels in the Mothers of Normals' Language in the Table Setting I Situation.

Mothers of Normals	Indefinite Pronoun Levels					
	1	2	3	4	5	6
MN 1	15	0	0	0	0	0
MN 2	15	0	1	0	0	0
MN 3	5	0	0	0	0	0
MN 4	2	0	0	0	0	0
MN 5	14	2	0	0	0	0

Table 13

The Frequency of Occurrence of the Various Indefinite Pronoun Levels in the
of Mothers of Down's Language in the Table Setting I Situation.

Mothers of Down's	Indefinite Pronoun Levels					
	1	2	3	4	5	6
MD 1	16	0	0	0	0	0
MD 2	23	2	0	0	0	0
MD 3	10	0	1	0	0	0
MD 4	14	0	0	0	0	0
MD 5	7	0	0	0	0	0
MD 6	7	0	0	0	0	0

Table 14

The Frequency of Occurrence of the Various Indefinite Pronoun Levels
in the Mothers of Normals' Language in the Table Setting II Situation

Mothers of Normals	Indefinite Pronoun Levels					
	1	2	3	4	5	6
MN 1	8	0	0	0	0	0
MN 2	22	0	0	0	0	0
MN 3	18	2	0	0	0	0
MN 4	11	1	1	0	0	0
MN 5	8	0	0	0	0	0

Table 15

The Frequency of Occurrence of the Various Indefinite Pronoun Levels
in the Mothers of Down's Language in the Table Setting II Situation

Mothers of Down's	Indefinite Pronoun Levels					
	1	2	3	4	5	6
MD 1	27	0	0	0	0	0
MD 2	24	1	1	0	0	0
MD 3	12	0	0	0	0	0
MD 4	5	0	0	0	0	0
MD 5	9	0	0	0	0	0
MD 6	5	0	0	0	0	0

Table 16

The Frequency of Occurrence of the Various Personal Pronoun Levels
in the Mothers of Normals' Language in the Play Situation

Mothers of Normals	Personal Pronoun Levels						
	1	2	3	4	5	6	7
MN 1	2	2	0	0	0	0	0
MN 2	5	0	0	0	0	0	0
MN 3	2	1	1	0	0	0	0
MN 4	0	0	0	0	0	0	0
MN 5	3	3	3	0	0	0	0

Table 17

The Frequency of Occurrence of the Various Personal Pronoun Levels
in the Mothers of Down's Language in the Play Situation.

Mothers of Down's	Personal Pronoun Levels						
	1	2	3	4	5	6	7
MD 1	14	6	0	0	0	0	0
MD 2	0	3	0	0	0	0	0
MD 3	8	0	0	0	0	0	0
MD 4	2	0	0	0	0	0	0
MD 5	1	0	2	0	0	0	1
MD 6	5	0	1	0	0	2	0

Table 18

The Frequency of Occurrence of the Various Personal Pronoun Levels
in the Mothers of Normals' Language in the Table Setting I Situation.

Mothers of Normals	Personal Pronoun Levels						
	1	2	3	4	5	6	7
MN 1	0	0	1	0	0	0	0
MN 2	2	0	0	0	0	0	0
MN 3	4	0	6	0	0	1	0
MN 4	0	0	0	0	0	0	0
MN 5	2	0	8	0	0	0	0

Table 19

The Frequency of Occurrence of the Various Personal Pronoun Levels
in the Mothers of Down's Language in the Table Setting I Situation.

Mothers of Down's	Personal Pronoun Levels						
	1	2	3	4	5	6	7
MD 1	4	0	2	0	0	0	0
MD 2	7	0	0	0	0	0	0
MD 3	4	2	6	0	0	1	0
MD 4	3	0	1	0	0	0	0
MD 5	2	0	1	0	0	0	0
MD 6	9	1	8	0	0	0	0

Table 20

The Frequency of Occurrence of the Various Personal Pronoun Levels in the Mothers of Normals' Language in the Table Setting II Situation.

Mothers of Normals	Personal Pronoun Levels						
	1	2	3	4	5	6	7
MN 1	0	0	2	1	0	0	0
MN 2	19	0	5	0	1	0	0
MN 3	9	0	1	0	3	0	0
MN 4	3	0	4	0	0	0	0
MN 5	1	0	3	0	0	0	0

Table 21

The Frequency of Occurrence of the Various Personal Pronoun Levels
in the Mothers of Down's Language in the Table Setting II Situation.

Mothers of Down's	Personal Pronoun Levels						
	1	2	3	4	5	6	7
MD 1	19	0	3	0	0	0	0
MD 2	10	0	1	0	0	0	0
MD 3	0	0	2	0	0	0	0
MD 4	1	0	2	0	0	0	0
MD 5	2	0	1	0	0	0	0
MD 6	11	0	2	0	1	0	0

Table 22

The Frequency of Occurrence of the Various Main Verb Levels
in the Mothers of Normals' Language in the Play Situation.

Mothers of Normals	Main Verb Levels							
	1	2	3	4	5	6	7	8
MN 1	9	0	0	0	0	0	0	0
MN 2	27	0	3	1	0	0	0	0
MN 3	6	0	0	0	0	1	0	0
MN 4	10	0	1	0	0	0	0	0
MN 5	14	0	3	1	0	0	0	0

Table 23

The Frequency of Occurrence of the Various Main Verb Levels
in the Mothers of Down's Language in the Play Situation.

Mothers of Down's	Main Verb Levels							
	1	2	3	4	5	6	7	8
MD 1	28	0	2	0	0	0	0	0
MD 2	12	0	1	0	0	0	0	0
MD 3	35	0	0	1	0	0	0	0
MD 4	7	0	4	0	0	0	0	0
MD 5	8	0	2	0	0	0	0	0
MD 6	24	0	0	2	0	1	0	0

Table 24

The Frequency of Occurrence of the Various Main Verb Levels
in the Mothers of Normals' Language in the Table Setting I Situation.

Mothers of Normals	Main Verb Levels							
	1	2	3	4	5	6	7	8
MN 1	18	0	14	0	0	0	0	0
MN 2	24	0	2	1	0	0	0	0
MN 3	5	0	3	7	0	0	0	0
MN 4	2	0	0	0	0	0	0	0
MN 5	24	1	10	0	0	0	0	0

Table 25

The Frequency of Occurrence of the Various Main Verb Levels in
the Mothers of Down's Language in the Table Setting I Situation.

Mothers of Down's	Main Verb Levels							
	1	2	3	4	5	6	7	8
MD 1	21	0	3	2	0	0	0	0
MD 2	38	0	0	0	0	0	0	0
MD 3	33	1	9	1	0	0	0	0
MD 4	32	0	0	0	0	0	0	0
MD 5	6	0	4	2	0	0	0	0
MD 6	17	0	7	1	0	0	0	0

Table 26

The Frequency of Occurrence of the Various Main Verb Levels in the Mothers of Normals' Language in the Table Setting II Situation

Mothers of Normals	Main Verb Levels							
	1	2	3	4	5	6	7	8
MN 1	11	0	6	0	0	0	0	0
MN 2	55	0	4	2	0	0	0	0
MN 3	9	0	2	8	2	0	0	0
MN 4	16	0	0	3	0	0	0	0
MN 5	10	0	6	1	0	0	0	0

Table 27

The Frequency of Occurrence of the Various Main Verb Levels in the Mothers of Down's Language in the Table Setting II Situation.

Mothers of Down's	Main Verb Levels							
	1	2	3	4	5	6	7	8
MD 1	29	0	4	0	0	0	0	0
MD 2	46	0	4	1	0	0	0	0
MD 3	35	0	1	1	0	0	0	0
MD 4	17	0	0	1	0	0	0	0
MD 5	15	0	3	2	0	0	0	0
MD 6	30	1	7	0	0	0	0	0

Table 28

The Frequency of Occurrence of the Various Secondary Verb Levels
in the Mothers of Normals' Language in the Play Situation

Mothers of Normals	Secondary Verb Levels					
	1	2	3	4	5	6
MN 1	0	0	0	0	0	0
MN 2	0	0	0	1	0	0
MN 3	0	0	0	0	0	1
MN 4	0	0	0	0	0	0
MN 5	0	0	1	5	0	0

Table 29

The Frequency of Occurrence of the Various Secondary Verb Levels
in the Mothers of Down's Language in the Play Situation

Mothers of Down's	Secondary Verb Levels					
	1	2	3	4	5	6
MD 1	0	0	0	0	0	0
MD 2	0	0	0	0	0	0
MD 3	0	1	0	0	1	0
MD 4	0	0	0	0	0	0
MD 5	0	1	0	0	0	0
MD 6	0	0	0	0	0	0

Table 30

The Frequency of Occurrence of the Various Secondary Verb Levels
in the Mothers of Normals' Language in the Table Section I Levels.

Mothers of Normals	Secondary Verb Levels					
	1	2	3	4	5	6
MN 1	1	0	0	0	0	0
MN 2	0	1	0	0	0	0
MN 3	0	1	0	0	0	0
MN 4	0	0	0	0	0	0
MN 5	0	2	0	0	0	0

Table 31

The Frequency of Occurrence of the Various Secondary Verb Levels
in the Mothers of Down's Language in the Table Setting I Situation.

Mothers of Down's	Secondary Verb Levels					
	1	2	3	4	5	6
MD 1	1	0	0	0	0	0
MD 2	0	0	0	0	0	0
MD 3	2	5	0	0	0	0
MD 4	1	0	0	0	0	0
MD 5	0	0	0	0	0	0
MD 6	0	2	0	0	0	0

Table 32

The Frequency of Occurrence of the Various Secondary Verb Levels
in the Mothers of Normals' Language in the Table Setting II Situation

Mothers of Normals	Secondary Verb Levels					
	1	2	3	4	5	6
MN 1	1	0	0	0	0	0
MN 2	3	1	2	0	0	0
MN 3	0	2	0	0	0	0
MN 4	0	0	0	0	0	0
MN 5	0	1	0	0	0	0

Table 33

The Frequency of Occurrence of the Various Secondary Verb Levels
in the Mothers of Down's Language in the Table Setting II Situation

Mothers of Down's	Secondary Verb Levels					
	1	2	3	4	5	6
MD 1	1	1	0	0	0	0
MD 2	0	1	0	0	0	1
MD 3	1	0	0	0	0	0
MD 4	1	0	0	0	0	0
MD 5	0	0	0	0	0	0
MD 6	3	2	0	0	0	0

Table 34

The Frequency of Occurrence of the Various Negative Levels
in the Mothers of Normals' Language in the Play Situation

Mothers of Normals	Negatives Levels				
	1	2	3	4	5
MN 1	0	0	0	0	0
MN 2	0	0	0	0	0
MN 3	2	0	0	0	0
MN 4	0	0	0	0	0
MN 5	0	0	1	0	0

Table 35

The Frequency of Occurrence of the Various Negative Levels
in the Mothers of Down's Language in the Play Situation

Mothers of Down's	Negatives Levels				
	1	2	3	4	5
MD 1	1	0	0	0	0
MD 2	0	0	0	0	0
MD 3	0	0	0	0	0
MD 4	0	0	0	0	0
MD 5	0	0	0	0	0
MD 6	0	2	0	0	0

Table 36

The Frequency of Occurrence of the Various Negative Levels in the Mothers of Normals' Language in the Table Setting I Situation

Mothers of Normals	Negative Levels				
	1	2	3	4	5
MN 1	0	0	0	0	0
MN 2	0	0	0	0	0
MN 3	0	0	0	0	0
MN 4	0	0	0	0	0
MN 5	0	0	0	0	0

Table 37

The Frequency of Occurrence of the Various Negative Levels in the Mothers of Down's Language in the Table Setting I Situation.

Mothers of Down's	Negative Levels				
	1	2	3	4	5
MD 1	0	2	0	0	0
MD 2	1	0	0	0	0
MD 3	0	1	0	2	0
MD 4	0	0	0	0	0
MD 5	0	1	0	0	0
MD 6	0	0	1	0	0

Table 38

The Frequency of Occurrence of the Various Negative Levels in the Mothers of Normals' Language in the Table Setting II Situation.

Mothers of Normals	Negative Levels				
	1	2	3	4	5
MN 1	0	0	0	0	0
MN 2	0	1	0	0	0
MN 3	0	0	0	0	0
MN 4	0	1	0	0	0
MN 5	0	1	0	1	0

Table 39

The Frequency of Occurrence of the Various Negative Levels in the Mothers of Down's Language in the Table Setting II Situation.

Mothers of Down's	Negative Levels				
	1	2	3	4	5
MD 1	0	0	0	0	0
MD 2	0	1	0	0	0
MD 3	0	0	0	0	0
MD 4	0	0	0	1	0
MD 5	0	1	0	0	0
MD 6	0	0	0	0	0

Table 40

The Frequency of Occurrence of the Various Conjunction Levels in the Mothers of Normals' Language in the Play Situation.

Mothers of Normals	Conjunction Levels					
	1	2	3	4	5	6
MN 1	3	0	0	0	0	0
MN 2	2	0	0	0	0	1
MN 3	0	0	0	0	0	0
MN 4	0	0	0	0	0	1
MN 5	0	0	0	1	0	0

Table 41

The Frequency of Occurrence of the Various Conjunction Levels
in the Mothers of Down's Language in the Play Situation

Mothers of Down's	Conjunction Levels					
	1	2	3	4	5	6
MD 1	0	0	0	0	0	0
MD 2	0	0	0	0	0	0
MD 3	0	0	0	1	0	0
MD 4	0	0	0	0	0	0
MD 5	0	0	0	0	0	0
MD 6	0	0	0	0	0	0

Table 42

The Frequency of Occurrence of the Various Conjunction Levels in the Mothers of Normals' Language in the Table Setting I Situation.

Mothers of Normals	Conjunction Levels					
	1	2	3	4	5	6
MN 1	5	0	0	0	0	0
MN 2	0	0	0	1	0	2
MN 3	13	1	0	1	0	0
MN 4	12	0	0	0	0	0
MN 5	4	0	0	1	0	0

Table 43

The Frequency of Occurrence of the Various Conjunction Levels in the Mothers of Down's Language in the Table Setting I Situation.

Mothers of Down's	Conjunction Levels					
	1	2	3	4	5	6
MD 1	0	0	0	0	0	0
MD 2	0	0	0	0	0	0
MD 3	0	0	0	0	0	4
MD 4	1	0	0	0	0	0
MD 5	3	0	0	0	0	0
MD 6	5	0	0	0	0	0

Table 44

The Frequency of Occurrence of the Various Conjunction Levels in the Mothers of Normals' Language in the Table Setting II Situation.

Mothers of Normals	Conjunction Levels					
	1	2	3	4	5	6
MN 1	1	0	0	0	0	0
MN 2	5	0	0	0	0	2
MN 3	2	0	0	0	1	0
MN 4	8	0	0	0	0	0
MN 5	5	0	0	0	0	0

Table 45

The Frequency of Occurrence of the Various Conjunction Levels in the Mothers of Down's Language in the Table Setting II Situation.

Mothers of Down's	Conjunction Levels					
	1	2	3	4	5	6
MD 1	1	0	0	0	0	0
MD 2	1	0	0	0	0	0
MD 3	1	0	0	0	0	1
MD 4	0	0	0	0	0	0
MD 5	2	0	0	0	0	0
MD 6	2	0	0	0	0	0

Table 46

The Frequency of Occurrence of the Various Wh Questions Levels
in the Mothers of Normals' Language in the Play Situation

Mothers of Normals	Wh Questions Levels				
	1	2	3	4	5
MN 1	2	3	0	0	0
MN 2	5	1	2	0	0
MN 3	6	0	0	0	0
MN 4	4	0	0	0	0
MN 5	5	0	2	2	0

Table 47

The Frequency of Occurrence of the Various Wh Questions Levels
in the Mothers of Down's Language in the Play Situation

Mothers of Down's	Wh Questions Levels				
	1	2	3	4	5
MD 1	0	2	0	0	0
MD 2	6	3	1	0	0
MD 3	0	0	0	0	0
MD 4	0	0	0	0	0
MD 5	0	0	2	0	0
MD 6	3	0	0	0	0

Table 48

The Frequency of Occurrence of the Various Wh Questions in the Mothers of Normals' Language in the Table Setting I Situation

Mothers of Normals	Wh Questions Levels				
	1	2	3	4	5
MN 1	0	4	0	0	0
MN 2	0	7	0	0	0
MN 3	0	0	0	0	0
MN 4	0	0	1	0	0
MN 5	0	1	0	1	0

Table 49

The Frequency of Occurrence of the Various Wh Questions in the Mothers of Down's Language in the Table Setting I Situation.

Mothers of Down's	Wh Questions Levels				
	1	2	3	4	5
MD 1	0	0	0	0	0
MD 2	3	0	1	0	0
MD 3	1	1	1	0	0
MD 4	0	0	0	0	0
MD 5	0	0	0	0	0
MD 6	0	2	0	0	0

Table 50

The Frequency of Occurrence of the Various Wh Questions in the Mothers of Normals' Language in the Table Setting II Situation.

Mothers of Normals	Wh Questions Levels				
	1	2	3	4	5
MN 1	0	16	0	0	0
MN 2	0	5	2	0	0
MN 3	0	5	5	0	0
MN 4	1	1	0	0	0
MN 5	0	2	0	0	0

Table 51

The Frequency of Occurrence of the Various Wh Questions in the
 Mothers of Down's Language in the Table Setting II Situation

Mothers of Down's	Wh Questions Levels				
	1	2	3	4	5
MD 1	0	0	0	0	0
MD 2	0	0	0	0	0
MD 3	1	1	0	0	0
MD 4	0	0	1	0	0
MD 5	0	0	0	0	0
MD 6	0	11	0	0	0

Table 52

The Frequency of Occurrence of Raised
Intonation and Interrogative Reversals in the
Mothers of Normals' Language in the Play Situation

Mothers of Normals	Raised Intonation	Interrogative Reversals
MN1	2	1
MN2	1	14
MN3	1	3
MN4	2	4
MN5	1	15

Table 53

The Frequency of Occurrence of Raised
Intonation and Interrogative Reversals in the
Mothers of Down's Language in the Play Situation

Mothers of Down's	Raised Intonation	Interrogative Reversals
MD1	1	5
MD2	0	3
MD3	1	7
MD4	7	6
MD5	4	4
MD6	3	12

Table 54

The Frequency of Occurrence of Raised
Intonation and Interrogative Reversals in the
Mothers of Normals' Language in the Table Setting I Situation.

Mothers of Normals	Raised Intonation	Interrogative Reversals
MN1	1	2
MN2	3	5
MN3	3	1
MN4	0	1
MN5	5	4

Table 55

The Frequency of Occurrence of Raised
Intonation and Interrogative Reversals in the
Mothers of Down's Language in the Table Setting I Situation

Mothers of Down's	Raised Intonation	Interrogative Reversals
MD1	0	1
MD2	3	1
MD3	0	5
MD4	1	8
MD5	9	1
MD6	11	3

Table 56

The Frequency of Occurrence of Raised
Intonation and Interrogative Reversals in the
Mothers of Normals' Language in the Table Setting II Situation

Mothers of Normals	Raised Intonation	Interrogative Reversals
MN1	1	2
MN2	2	6
MN3	2	4
MN4	0	7
MN5	2	7

Table 57

The Frequency of Occurrence of Raised
Intonation and Interrogative Reversals in the
Mothers of Down's Language in the Table Setting II Situation

Mothers of Down's	Raised Intonation	Interrogative Reversals
MD1	0	0
MD2	3	1
MD3	1	1
MD4	0	21
MD5	8	0
MD6	5	13

Table 58

The Frequency of Occurrence of Single Words
in the Language of the Mothers
of Normals in All Three Situations

Mothers of Normals	Play Situation	Table Setting I	Table Setting II
MN1	5	9	10
MN2	7	6	9
MN3	4	4	7
MN4	4	8	12
MN5	3	3	4

Table 59

The Frequency of Occurrence of Single Words
in the Language of the Mothers
of Down's in All Three Situations

Mothers of Down's	Play Situation	Table Setting I	Table Setting II
MD1	8	7	8
MD2	3	15	9
MD3	6	16	13
MD4	9	19	16
MD5	2	13	15
MD6	7	18	15

Table 60
 The Frequency of Occurrence of Imperative Sentences
 in the Language of Mothers
 of Normals in All Three Situations

Mothers of Normals	Play Situation	Table Setting I	Table Setting II
MN1	6	11	8
MN2	18	17	29
MN3	0	1	6
MN4	5	1	3
MN5	8	14	5

Table 61

The Frequency of Occurrence of Imperative Sentences
in the Language of Mothers
of Down's in All Three Situations

Mothers of Down's	Play Situation	Table Setting I	Table Setting II
MD1	16	21	25
MD2	7	28	36
MD3	28	27	33
MD4	8	26	13
MD5	5	10	15
MD6	20	7	21

Table 62

The Frequency of Occurrence of Declarative Sentences
in the Language of Mothers
of Normals in All Three Situations

Mothers of Normals	Play Situation	Table Setting I	Table Setting II
MN1	2	19	4
MN2	9	4	16
MN3	8	11	14
MN4	1	1	13
MN5	6	12	7

Table 63

The Frequency of Occurrence of Declarative Sentences
in the Language of Mothers
of Down's in All Three Situations

Mothers of Down's	Play Situation	Table Setting I	Table Setting II
MD1	15	5	8
MD2	6	9	7
MD3	3	12	5
MD4	3	4	4
MD5	7	5	8
MD6	4	16	17

Table 64

The Frequency of Occurrence of Grammatically Incomplete Sentences
in the Language of Mothers
of Normals in All Three Situations

Mothers of Normals	Play Situation	Table Setting I	Table Setting II
MN1	13	12	13
MN2	13	9	10
MN3	4	17	9
MN4	4	18	23
MN5	6	6	6

Table 65

The Frequency of Occurrence of Grammatically Incomplete Sentences
in the Language of Mothers
of Down's in All Three Situations

Mothers of Down's	Play Situation	Table Setting I	Table Setting II
MD1	12	8	21
MD2	9	30	21
MD3	9	29	26
MD4	12	22	20
MD5	9	19	27
MD6	10	29	17

Table 66
 The T.T.R.
 in the Language of Mothers
 of Normals in All Three Situations

Mothers of Normals	Play Situation	Table Setting I	Table Setting II
MN1	.60	.26	.20
MN2	.66	.41	.42
MN3	.46	.44	.51
MN4	.66	.41	.39
MN5	.54	.38	.44

Table 67
 The T.T.R.
 in the Language of Mothers
 of Down's in All Three Situations

Mothers of Down's	Play Situation	Table Setting I	Table Setting II
MD1	.50	.38	.34
MD2	.68	.36	.45
MD3	.54	.44	.44
MD4	.58	.24	.21
MD5	.46	.50	.46
MD6	.42	.50	.34

Table 68

Total Words Produced by the Mothers of
Normals in All Three Situations

Mothers of Normals	Play Situation	Table Setting I	Table Setting II
MN1	73	176	203
MN2	239	229	377
MN3	114	163	259
MN4	64	81	180
MN5	208	258	180

Table 69
 Total Words Produced by the Mothers of
 Down's in All Three Situations

Mothers of Down's	Play Situation	Table Setting I	Table Setting II
MD1	163	106	161
MD2	122	225	216
MD3	154	274	219
MD4	103	211	197
MD5	101	109	120
MD6	202	238	312

Table 70

The Total Verbal Responses in the Language of
Mothers of Normals in all Three Situations

Mothers of Normals	Play Situation	Table Setting I	Table Setting II
MN1	26	45	47
MN2	55	44	63
MN3	22	32	45
MN4	18	24	43
MN5	38	38	27

Table 71

The Total Verbal Responses in the Language of
Mothers of Down's in All Three Situations

Mothers of Down's	Play Situation	Table Setting I	Table Setting II
MD1	48	35	52
MD2	33	69	60
MD3	49	74	62
MD4	32	60	58
MD5	29	39	52
MD6	48	66	68

Table 72

The Total Sentences in the Language of
Mothers of Normals in All Three Situations

Mothers of Normals	Play Situation	Table Setting I	Table Setting II
MN1	30	49	44
MN2	63	42	70
MN3	22	31	46
MN4	20	23	48
MN5	44	43	29

Table 73
 The Total Sentences in the Language of
 Mothers of Down's in All Three Situations

Mothers of Down's	Play Situation	Table Setting I	Table Setting II
MD1	51	35	54
MD2	35	73	68
MD3	49	76	68
MD4	32	60	57
MD5	29	39	52
MD6	51	67	74

Table 74

The Mean Length of Verbal Responses in the Language of
Mothers of Normals in All Three Situations

Mothers of Normals	Play Situation	Table Setting I	Table Setting II
MN1	2.8	3.9	4.3
MN2	4.4	5.2	5.9
MN3	4.8	5.1	5.7
MN4	3.5	3.4	4.2
MN5	5.5	6.7	6.6

Table 75

The Mean Length of Verbal Responses in the Language of
 Mothers of Down's in All Three Situations

Mothers of Down's	Play Situation	Table Setting I	Table Setting II
MD1	3.4	3.0	3.0
MD2	3.6	3.3	3.6
MD3	3.1	3.7	3.5
MD4	3.2	3.5	3.4
MD5	3.5	2.8	2.3
MD6	4.2	3.6	4.6

Table 76

The Mean Length of Sentences in the Language of
Mothers of Normals in All Three Situations

Mothers of Normals	Play Situation	Table Setting I	Table Setting II
MN1	2.4	3.6	4.6
MN2	3.8	5.5	5.4
MN3	5.2	5.3	5.6
MN4	3.2	3.5	3.8
MN5	4.7	6.0	6.2

Table 77

The Mean Length of Sentences in the Language of
 Mothers of Down's in All Three Situations

Mothers of Down's	Play Situation	Table Setting I	Table Setting II
MD1	3.2	3.0	3.0
MD2	3.5	3.0	3.2
MD3	3.1	3.6	3.2
MD4	3.2	3.5	3.5
MD5	3.5	2.8	2.3
MD6	4.0	3.6	4.2

APPENDIX B

Language Sample Protocol

Play situation

baby doll/

shake it/

oh good boy/

give it to mommy/

give it to mommy/

come on/

come on give it to mommy/

Billy/

come on/

come on/

don't break it/

here/

give it to mommy/

come on Billy/

come on give it to mommy/

thank you/

give mommy the ball/

give mommy/

the ball/

give mommy the ball/

Billy/

give mommy the ball/

come on/

give mommy it/

come on/

look Billy/

you have to press hard/

look Billy/

look/

that's loud/

come on/

Billy/

give mommy the ball/

come on/

come on/

oh throw down/

come on give me the ball/

well if you have all day I do/

oh oh Billy/

follow me now/

okay/

can I have it//

can you do that//

can you do this//

give mommy the ball hmm//

don't you want to give me the ball//

can I have the ball hmm//

aren't you going//

can you give mommy the ball//

Table Setting I

looks like something he can/
look Billy we're going to set the table/
we're going to set the table Billy/
Billy/
now watch you do like mommy does/
just like mommy does/
no no no no no/
you watch mommy/
here/
just like mommy does/
watch/
there/
here/
oh you're going to eat now/
here/
let's see what Billy can do/
I don't think he's ever going to get this/
okay/
put the dish down/
put the dish down/
napkin/
on the floor/
this is over/
put the fork/
fork/
now put/

over here/

fork Billy/

fork Billy/

fork Billy/

put it down/

put it down/

put the fork down/

come on/

put it down/

spoon/

spoon/

spoon/

the spoon Billy/

over here Billy/

Billy over here/

put the spoon down Billy/

put the fork down/

over here/

fork/

put it down/

put the spoon over here Billy/

Billy lookit/

put the spoon here/

no we're not going to eat we're going to set the table Billy/

here/

let's put this together/
we're not gonna use that/
here's the napkin/
put the napkin down/
come on/
allright/
Billy/
Billy/
put the fork down/
come Billy/
put the fork down/
put it down/
put it down/
come on/
put the fork down/
now what you going to do//
can you do that//
where's the spoon go Billy//
how about knife Billy//
what are you going to do with the knife//
Billy should we put the silver here//
hmm//
now can you set the table for mommy//
can you set the table for mommy//

Table setting II

start with the dish/

put the dish on the table here Billy right here/

leave it there/

allright/

put the napkin down/

put the fork down/

no no Billy/

put the fork down/

now put it down/

put it down/

Billy/

put the fork down/

put it down then we'll put the spoon over here/

Billy/

Billy/

put the fork down/

and the dish/

come on/

put the plate down/

there/

now put the spoon over here/

Billy/

Billy/

come on put the spoon over here Billy/

come on/

come on put the spoon down/

over here/

Billy/

Billy/

Billy/

over here/

put the spoon down/

over here/

put the spoon/

over here Billy/

Billy/

put the fork down/

right hand/

Billy/

put it down/

put the fork by the cup/

by the cup/

come on by the cup/

let's take it out of here/

Billy put the dish over here/

Billy/

push the dish/

Billy/

no this dish/

this dish/

put it here/

put the dish here/

come on/

put it here/

put the dish down/

put the dish here/

over here Billy/

at home these are play things that's why/

what about the cup//

don't you want to learn to set the table today Billy//

hmm//

you want over there//

where does this go//

TECHNICAL REPORTS

University of Minnesota Research, Development and Demonstration
Center in Education of Handicapped Children

(Place of publication shown in parentheses where applicable)

1. N. Buium & J. Rynders. The early maternal linguistic environment of normal and Down's Syndrome (Mongoloid) language learning children. Research Report #51. May 1973.
2. T. Archvany & S. Samuels. A mastery based experimental program for teaching mentally retarded children word recognition and reading comprehension skills through use of hypothesis/test procedures. Research Report #50. May 1973.
3. W. Bart. The process of cognitive structure complexification. Research Report #49. April 1973.
4. B. Best. Classificatory development in deaf children: Research on language and cognitive development.
5. R. Riegel, A. Taylor, & F. Danner. The effects of training in the use of a grouping strategy on the learning and memory capabilities of young EMR children. Research Report #48. April 1973.
6. J. Turnure & M. Thurlow. The latency of forward and backward association responses in an elaboration task. Research Report #47. March 1973.
7. R. Riegel & A. Taylor. Strategies in the classroom: A summer remedial program for young handicapped children. Occasional Paper #14. March 1973.
8. D. Moore. Early childhood special education for the hearing handicapped. Occasional Paper #13. February 1973.
9. R. Riegel & A. Taylor. A comparison of conceptual strategies for grouping and remembering employed by educable mentally retarded and non-retarded children. Research Report #46. February 1973.
10. J. Rynders. Two basic considerations in utilizing mothers as tutors of their very young retarded or potentially retarded children. Occasional Paper #12. January 1973.
11. R. Bruininks, J. Rynders, & J. Gross. Social acceptance of mildly retarded pupils in resource rooms and regular classes. Research Report #45. January 1973.
12. J. Turnure & M. Thurlow. The effects of interrogative elaborations on the learning of normal and EMR children. Research Report #44. January 1973. (Proceedings of the International Association for the Scientific Study of Mental Deficiency, in press).
13. J. Turnure & S. Samuels. Attention and reading achievement in first grade boys and girls. Research Report #43. November 1972. (Journal of Educational Psychology, in press).
14. R. Riegel, A. Taylor, S. Clarren, & F. Danner. Training educationally handicapped children to use associative grouping strategies for the organization and recall of categorizable material. Research Report #42. November 1972.
15. R. Riegel, F. Danner, & A. Taylor. Steps in sequence: Training educationally handicapped children to use strategies for learning. Development Report #2. November 1972.
16. A. Taylor, M. Thurlow, & J. Turnure. The teacher's introduction to: the Math Vocabulary Program. Development Report #1. March 1973.
17. J. Turnure & M. Thurlow. The effects of structural variations in elaboration on learning by normal and EMR children. Research Report #41. September 1972.
18. A. Taylor & N. Bender. Variations of strategy training and the recognition memory of EMR children. Research Report #40. September 1972. (American Educational Research Journal, in press).
19. D. Moore, C. McIntyre, & K. Weiss. Evaluation of programs for hearing impaired children: Report of 1971-1972. Research Report #39. September 1972.
20. R. Rubin. Follow-up of applicants for admission to graduate programs in special education. Occasional Paper #11. July 1972.
21. D. Moore. Communication - Some unanswered questions and some unquestioned answers. Occasional Paper #10. July 1972.
22. A. Taylor & S. Whitely. Overt verbalization and the continued production of effective elaborations by EMR children. Research Report #38. June 1972. (American Journal of Mental Deficiency, in press).
23. R. Riegel. Measuring educationally handicapped children's organizational strategies by sampling overt groupings. Research Report #37. May 1972.
24. E. Callistel, M. Boyle, L. Curran, & M. Hawthorne. The relation of visual and auditory aptitudes to first grade low readers' achievement under sight-word and systematic phonic instruction. Research Report #36. May 1972.
25. E. Callistel & P. Fischer. Decoding skills acquired by low readers taught in regular classrooms using clinical techniques. Research Report #35. May 1972.
26. J. Turnure & M. Thurlow. Verbal elaboration in children: Variations in procedures and design. Research Report #34. March 1972.
27. D. Krus & W. Bart. An ordering-theoretic method of multidimensional scaling of items. Research Report #33. March 1972.

28. J. Turnure & S. Larsen. Effects of various instruction and reinforcement conditions on the learning of a three-position oddity problem by nursery school children. Research Report #32. March 1972.
29. J. Turnure & S. Larsen. Outerdirectedness in mentally retarded children as a function of sex of experimenter and sex of subject. Research Report #31. March 1972.
30. J. Rynders & J. Morrobin. A mobile unit for delivering educational services to Down's Syndrome (Mongoloid) infants. Research Report #30. January 1972. (Presented at Council for Exceptional Children, Special National Conference, Memphis, December, 1971).
31. F. Danner & A. Taylor. Pictures and relational imagery training in children's learning. Research Report #29. December 1971. (Journal of Experimental Child Psychology, in press).
32. J. Turnure & M. Thurlow. Verbal elaboration phenomena in nursery school children. Research Report #28. December 1971. (Study II: Proceedings of 81st Annual Convention of the American Psychological Association, in press).
33. D. Moores & C. McIntyre. Evaluation of programs for hearing impaired children: Progress report 1970-1971. Research Report #27. December 1971.
34. S. Samuels. Success and failure in learning to read: A critique of the research. Occasional Paper #9. November 1971. (In M. Kling, the Literature of Research in Reading with Emphasis on Modes, Rutgers University, 1971).
35. S. Samuels. Attention and visual memory in reading acquisition*. Research Report #26. November, 1971.
36. J. Turnure & M. Thurlow. Verbal elaboration and the promotion of transfer of training in educable mentally retarded. Research Report #25. November 1971. (Journal of Experimental Child Psychology, 1973, 15, 137-148).
37. A. Taylor, M. Joaberg, & S. Whitely. Elaboration training and verbalization as factors facilitating retarded children's recall. Research Report #24. October 1971. (Journal of Educational Psychology, in press).
38. W. Bart & D. Krus. An ordering-theoretic method to determine hierarchies among items. Research Report #23. September 1971.
39. A. Taylor, M. Joaberg, & J. Knowlton. Mental elaboration and learning in retarded children. Research Report #22. September 1971. (Mental Elaboration and Learning in EMR Children. American Journal of Mental Deficiency, 1972, 77, 69-76).
40. J. Turnure & S. Larsen. Outerdirectedness in educable mentally retarded boys and girls. Research Report #21. September 1971. (American Journal of Mental Deficiency, in press).
41. R. Bruininks, T. Glaman, & C. Clerk. Prevalence of learning disabilities: Findings, issues, and recommendations. Research Report #20. June 1971. (Presented at Council for Exceptional Children Convention, Miami Beach, April, 1971).
42. M. Thurlow & J. Turnure. Mental elaboration and the extension of mediational research: List length of verbal phenomena in the mentally retarded. Research Report #19. June 1971. (Journal of Experimental Child Psychology, 1972, 14, 184-195).
43. G. Siegel. Three approaches to speech retardation. Occasional Paper #8. May 1971.
44. D. Moores. An investigation of the psycholinguistic functioning of deaf adolescents. Research Report #18. May 1971. (Exceptional Children, May, 1970, 36, 643-652).
45. D. Moores. Recent research on manual communication. Occasional Paper #7. April, 1971. (Keynote Address, Division of Communication Disorders, Council for Exceptional Children Annual Convention, Miami Beach, April, 1971).
46. J. Turnure, S. Larsen, & M. Thurlow. Two studies on verbal elaboration in special populations I. The Effects of brain injury II. Evidence of transfer of training. Research Report #17. April 1971. (Study I: American Journal of Mental Deficiency, in press).
47. R. Bruininks & J. Rynders. Alternatives to special class placement for educable mentally retarded children. Occasional Paper #6. March 1971. (Focus on Exceptional Children, 1971, 3, 1-12).
48. D. Moores. Neo-oralsim and the education of the deaf in the Soviet Union. Occasional Paper #5. February 1971. (Exceptional Children, January, 1972, 39, 377-384).
49. D. Feldman, B. Harriman, & S. Hartfeldt. Unusualness, appropriateness, transformation and condensation as criteria for creativity. Research Report #16. February 1971. (American Educational Research Association Annual Conference, New York, February 1971).
50. F. Broen & G. Siegel. Variations in normal speech disfluencies. Research Report #15. January 1971. (Language & Speech, in press).
51. D. Feldman. Map understanding as a possible crystallizer of cognitive structures. Occasional Paper #4. January 1971. (American Educational Research Journal, 1971, 3, 484-502)
52. J. Rynders. Industrial arts for elementary mentally retarded children: An attempt to redefine and clarify goals. Occasional Paper #3. January 1971.
53. D. Moores. Education of the deaf in the United States. Occasional Paper #2. November 1970. (Moscow Institute of Defectology, 1971, Published in Russian).
54. R. Bruininks & C. Clerk. Auditory and visual learning in first-, third-, and fifth-grade children. Research Report #14. November 1970.
55. R. Bruininks & C. Clerk. Auditory and visual learning in first grade educable mentally retarded normal children. Research Report #13. November 1970. (American Journal of Mental Deficiency, 1972, 76, No. 5, 561-567).

56. A. Lerman. Teaching word recognition to disadvantaged boys with variations in auditory and visual perceptual abilities. Research Report #12. November 1970. (Journal of Learning Disabilities, 1970, 3, 30-39).
57. R. Bruininks & W. Lucker. Change and stability in correlations between intelligence and reading test scores among disadvantaged children. Research Report #11. October 1970. (Journal of Reading Behavior, 1970, 2, 295-305).
58. R. Rubin. Sex differences in effects of kindergarten attendance on development of school readiness and language skills. Research Report #10. October 1970. (Elementary School Journal, 72, No. 5, February 1972).
59. R. Rubin & B. Balow. Prevalence of school learning & behavior disorders in a longitudinal study population. Research Report #9. October 1970. (Exceptional Children, 1971, 38, 293-299).
60. D. Feldman & J. Bratton. On the relativity of giftedness: An empirical study. Research Report #8. August 1970. (American Educational Research Annual Conference, New York, February, 1971).
61. J. Turnure, M. Thurlow, & S. Larsen. Syntactic elaboration in the learning & reversal of paired-associates by young children. Research Report #7. January 1971.
62. R. Martin & L. Berndt. The effects of time-out on stuttering in a 12-year-old boy. Research Report #6. July 1970. (Exceptional Children, 1970, 37, 303-304).
63. J. Turnure & M. Walsh. The effects of varied levels of verbal mediation on the learning and reversal of paired-associates by educable mentally retarded children. Research Report #5. June 1970. (Study I: American Journal of Mental Deficiency, 1971, 76, 60-67. Study II: American Journal of Mental Deficiency, 1971, 76, 306-312).
64. J. Turnure, J. Rynders, & N. Jones. Effectiveness of manual guidance, modeling & trial & error learning for inducing instrumental behavior in institutionalized retardates. Research Report #4. June 1970. (Merrill-Palmer Quarterly, 1973, 19, 49-65).
65. J. Turnure. Reactions to physical and social distractors by moderately retarded institutionalized children. Research Report #3. June 1970. (Journal of Special Education, 1970, 4, 283-294).
66. D. Moore. Evaluation of preschool programs: An interaction analysis model. Occasional Paper #1. April 1970. (Keynote Address, Diagnostic Pedagogy, International Congress on Deafness, Stockholm, August 1970, also presented at American Instructors of the Deaf Annual Convention, St. Augustine, Florida, April, 1970).
67. D. Feldman & W. Markwalder. Systematic scoring of ranked distractors for the assessment of Piagetian reasoning levels. Research Report #2. March 1970. (Educational and Psychological Measurement, 1971, 31, 347-362).
68. D. Feldman. The fixed-sequence hypothesis: Individual differences in the development of school related spatial reasoning. Research Report #1. March 1970.