

TEACHERS' RESPONSES TO THE VERBALIZATIONS/VOCALIZATIONS
OF DEVELOPMENTALLY DISABLED PRESCHOOL CHILDREN

by

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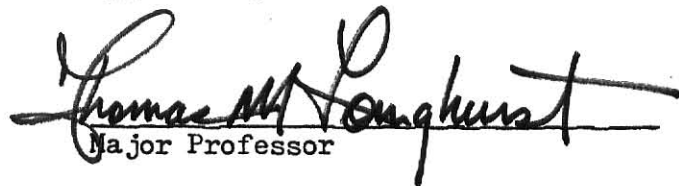
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INTRODUCTION

Presently, language habilitation techniques are based on research as to what and how the normally developing child learns. Miller and Yoder (1972) proposed that "... the training for retarded children should be taken from data available on language development in normal children, and this content should be taught in the same sequence as it is acquired by the normal child." Part of the research on language development focuses on adult-child interactions. Culatta et al. (1976) found that mothers, as a group, are able to predict the language their children will produce, and that the language a child will produce with an unfamiliar listener is representative of the language children will produce with their mothers. These results validate the findings of other research on adult-child interactions, where the adult was not one of the child's parents. Nelson (1973) found that children use five strategies in acquiring their first words (i.e., comprehension, production, imitation, repetition, and questioning), and that mothers gave very little contingent feedback and showed very little expansion of the children's utterances. Phillips (1970) found that mothers, speaking to their language learning children, use sentences with more inflections, more extensive inflections, more rapidly changing fundamental frequency during inflections, and longer total utterance time, as compared to sentences used in conversation with adults. Additionally, adult to adult speech had longer utterances, more verbs per utterance, more modifiers per utterance, a greater proportion of content words, and more verb forms than the speech of mothers to their language learning children. Holzman (1974) found, that for her subjects, nonelliptical, simple sentences accounted for the majority of the mothers' verbalizations. Snow (1972) concluded that mothers' speech to their language learning children was simple and more redundant than their normal speech, and that these modifications in the mothers' speech styles depended to some extent on the reactions of the child being addressed. Longhurst and Stepanich (1975) described the speech of mothers to their own children. These child subjects were divided into three age groups,

one year, two year, and three year olds. The results showed that mothers' speech addressed to their own language learning children changed on the syntactic level as the age of the child increased.

Very few investigations have been conducted as to the characteristics of teacher speech to language learning children. Although Cherry and Lewis (1976) found that mothers of female children talked more, asked more questions, repeated their children's utterances more often, and used longer utterances as compared to mothers of male children, Cherry (1975) found that preschool teachers verbally interacted more, verbally initiated more, and used more attentional-marked utterances in speech with boys than with girls. Granowsky and Krossner (1970) compared kindergarten teachers' speech with each other and with their students. The results of this investigation confirmed the findings of many parent-child interaction studies. Teachers, as do parents, used shorter sentences, more simple sentences and fragments, and fewer compound, complex, compound-complex, and elaborated sentences with children than in their speech to adults.

Upon ascertaining some of the characteristics of adult speech to language learning normal children, some investigators questioned if these characteristics would appear in the speech of adults to low linguistic level or language deficient children. This question would be important to the remediation of language deficits, for if the child acquires language from an adult model then adults interacting with language deficient children would have to modify their communicative styles to meet the language need of such children, much as teachers and mothers of normal children do. Only a few attempts have been made to describe verbal interactions between adults and language deficient children. Riedl (1972) compared the speech of mothers to that of nursery school teachers when assembled with high- and low-linguistic level normal children. The results indicated that teachers tended to use more questions and more common words in their speech to low-linguistic level children, and that there were no significant differences in the quantity and/or quality of language used when the mothers and teachers were compared. Cannon (1972) compared the speech of trained and untrained adults when

assembled with high- and low-linguistic level normal children, which revealed that, in a guessing game task, the scores of both high- and low-linguistic level children were the highest when interacting with trained adults, and that all the adult-subjects noticed a difference in the language abilities of the high- and low-linguistic level children. Siegel (1963a) found that the number of verbal or conversational exchanges occurred significantly more frequently when adults were assembled with high rather than low level children. In another investigation, Siegel (1963b) concluded that the actual verbal level of high- and low-linguistic level children determined the adults' verbal behavior, regardless of whether a child was labeled "high" or "low" in verbal activity. Marshall et al. (1973) investigated the use of tacts, mands, and intraverbal responses by mothers with nonretarded children versus those with retarded children of the same ages. The results revealed that tacts, mands, and intraverbal responses occurred with greater frequency with nonretarded children, and for the mothers of the retarded children, there was a higher mand rate. Hoskins (1974) found that mothers of language impaired children were able to accurately judge the children's abilities at one word response and repetition tasks, but above these levels, the mothers' judgements were consistently higher than the child's language abilities. Further, the mothers did not appear to adapt their linguistic complexity to match their judgements of their children's performance abilities, which the author concluded that mothers of language impaired children talk to their children as they would to normal children with little or no consideration for the child's language deficit. Therefore, from this literature, it would appear that adults not only can discriminate between high- and low-linguistic level children, but also speak differently to these children.

Muma (1970) suggested three techniques to remediate language deficiencies. These techniques are known as expansion and simple and complex expatiation. Expansion, as the author defined it, is a verbal response where the adult fills in the child's utterance with syntactic and semantic information. In simple and complex expatiation, the adult revises the child's utterance to add mainly

semantic information. These techniques have been found to occur naturally in the speech of adults to language learning children. They were first documented by Brown and Bellugi (1964), who found that two of their mother-subjects expanded their children's utterances approximately 30% of the time. The authors hypothesized from these results that expansions serve as a communication check from the mother to the child, and that the expansion technique could be an effective tutorial tool since it would confirm the appropriateness of the child's response as well as add additional linguistic information at a time when the child is most likely to be attending to the adult. Longhurst et al. (1974) studied the extent to which mothers used expansion and expatiation with their young language learning children. The study revealed that the probability of an interaction by the mother decreases proportionately with a decrease in the total output by her child; that is, mothers would typically model their own sentences rather than remain silent. Additionally, the authors found that expatiation occurred more frequently than expansion, and more frequently with mothers of three year old children. Seitz and Stewart (1975) examined the extent to which mothers expanded the utterances of two groups of children whose mean ages were 23 and 56 months. Mothers expanded and repeated more of the utterances of the two-year-old group than those of the children in the four-year-old group. Friedlander et al. (1972) studied the natural environments of two 12-month-old infants, one babbling and one with a few words, from a bilingual environment. This investigation revealed that noninteractive language accounted for large portions of the conversation directed to the children, with imitation accounting for the next largest portion.

Although it is known that adults expand, expatiate, and imitate the utterances of young language learning children, few attempts have been made to test the hypothesis put forth by Brown and Bellugi (1964). Cazden (1965) studied the effects of intervention with expansion and expatiation with 12 lower socioeconomic status children attending a day care center. She concluded that expatiation was a more effective procedure for encouraging language growth than expansion or no treatment. Leonard (1975) employed a modeling

procedure to train the use of two-word subject-verb utterances with young slow-learning children. His results showed that stimuli in the form of situational events proved facilitative in the children's subject-verb usage. Bandura and Harris (1966) investigated the role of modeling, reinforcement, and discrimination processes in training the passive transformation with second grade children. This investigation revealed that children who had the benefit of modeling cues, reinforcement feedback, and an active attentional set generated significantly more passives than either the control group or the children who were provided with reinforcement, modeling cues, or modeling combined with reinforcement. Hetenyi (1974) observed the language behaviors displayed between a five-year-old, primarily nonverbal male and his mother. After baseline observations were taken, the author attempted to increase the mother's modeling and praise behaviors, while decreasing her command and question behaviors. The mother's praise behaviors increased during the intervention period, but subsequently fell to lower levels upon follow-up observations. Seitz and Marcus (1976), in a case study of a 20-month-old, hearing impaired child and her parents, found that by imitating the child's vocalizations, the child would vocalize more, and would, in turn, imitate the parents' vocalizations.

From these investigations, it would appear that adults' responses to the utterances of the language-learning child are important to that child's acquisition of adult grammar. In addition, it appears that such responses can affect the acquisition of language in low-linguistic level or language deficient children. As to date, there are very few investigations as to adult responses to the utterances of language deficient children. The purpose of the present investigation was to describe preschool teachers' responses to the verbalizations/vocalizations of three developmentally disabled children. The description of these consequent events was accomplished by using a live-observation rate code, adapted from the code developed by Warren and Warren (1976). This investigation was designed to answer the following questions:

1. On the average, what percentage of the children's utterances were consequented by teachers?

2. What types of consequent events were used most frequently by teachers?
3. How were different categories of child utterances consequented by teachers?
4. To what extent did teachers use expansion, simple and complex expatiation, and imitation in response to the children's utterances?

This investigation represents one in a sequence of studies examining the relationship between the child's environment and that child's language acquisition. Perhaps, the answers provided by these investigations will aid in more effective programming for remediation of language deficiencies.

METHOD

Subjects

Three male children and the teachers of a preschool for the developmentally disabled served as subjects. All subjects were from middle socioeconomic status families, and all teachers of the preschool were native English speakers. The staff included two female teachers (1 and 2) with educational background in early education, one female aide (3) who was a student in education at the nearby university, one male aide (4) who attended high school in the city, a part-time music teacher (5), and a graduate student in speech pathology (6). Child A was four years, two months old; Child B, four years, seven months; and Child C, two years, ten months. Depending on the child's age, developmental language level was determined by performance on the Receptive-Expressive Emergent Language Inventory (Bzoch & League, 1971) or the Verbal Language Development Scale (Mecham, 1959). These scales were administered by the graduate student in speech pathology to the two preschool teachers. Child A scored a language equivalent of 1.56 years; Child B scored a language equivalent of 1.24 years; and Child C scored a combined language age of three months. No attempt was made in the current investigation to control for sex of the subjects, the educational backgrounds of the teachers, or the ages of the subjects.

Setting

All observations were conducted at a preschool for developmentally disabled children. The building which housed the preschool was equipped with a kitchen, a restroom, a therapy room, and a main

teaching area where the children were trained in motor, social and school readiness skills. This main room was furnished with a modified sandbox, two tables, chairs, a piano, and shelves holding toys and teaching materials. The data collected in this investigation were primarily the result of interactions occurring in the main teaching area and in the restroom.

Procedure

Prior to the beginning of the investigation, written consent was obtained for each subject to participate in the investigation. For the child subjects, written parental consent was obtained. The teachers were informed that they would be participating in a study dealing with generalization of language training. The teachers and parents of the child subjects were assured that all data would be coded to insure that their names would not be associated with the data. The specific details and purposes of the investigation were not disclosed to the teachers in order that they would perform as naturally as possible during the observations.

Each child was observed interacting with a teacher during a structured period known as "tablework." Tablework was defined as any period of time when a teacher was engaged in training the target child to perform a specific skill or skills. This time period was chosen as it was a period when the teacher interacted individually with the target child. It was felt that, because of the structure in the situation, the target child would have a greater opportunity to verbalize/vocalize, and therefore increase the probability that such utterances would be consequented by the teacher. These interactions were observed and coded for 15 minutes during tablework. Child A was observed for eight sessions; Child B, 15 sessions; and Child C, nine sessions.

Data collection for each session began by recording the first code utterance by the child which occurred after the beginning of the 15-minute observation period. A consequent event was scored next, if one occurred. As the child generally interacted with one teacher during this time period, the code number for that teacher was marked at the top of the data sheet. If another teacher interacted with the target child during this time, the coded consequent events

produced by that teacher were also accompanied by the code number for that teacher.

Child-teacher interactions during the 15-minute observation period were scored sequentially as they occurred. The data sheets on which observations were coded were composed of 15 two-line grids. Each grid represented a 50-second interval of the 15 minutes. On the first line of the grid, coded child utterances were recorded. The second line of the grid was reserved for recording coded consequent events. Each 50-second interval contained 20 scoring boxes for child utterances and consequent events.

Only those child-teacher interactions which occurred during the first 50 seconds of each minute of the 15-minute observation were scored. The last ten seconds of each minute was considered "off time" to allow the experimenter to organize data collection for the next minute. Any child utterances which began before the end of the 50-second interval and continued into the ten second "off time" were recorded, as were any consequent events for these utterances. Any child utterance beginning in the ten second "off time" but continuing into the next 50-second interval was not recorded, along with any consequent event following this utterance.

Child utterances included both verbalizations and vocalizations. The definitions and their symbols used for recording child utterances were as follows:

Initiation (I): An initiation was any verbalization by the child which was not preceded by an adult question, mand for verbalization, instruction, or comment. Initiations included spontaneous verbalizations to teachers and the child's speech to his/herself. Imitations and expressive vocalizations, such as cries, whimpers, singing, etc., were not considered as initiations.

Response (R): A response was any verbalization the child made following a comment by a teacher, or an instruction for nonverbal behavior. Responses to mands for verbalization, models, questions, and imitations were scored separately.

Obligatory Response (Ob): An obligatory response was a verbalization by the child which followed a question, mand for verbalization, or specific model for verbalization. The response need not have been correct to be scored, but it had to be intelligible and appropriate. Appropriate, in this case, referred to the content of the question, mand or model: the child's response had to be of the general content specified by the question, mand, or model. Additionally, (Ob) was scored if the child nodded his/her head in affirmative response to a yes/no question.

Obligatory response required, but inappropriate response made (X): (X) indicated the child had made an inappropriate response to teacher questions, mands for verbalization, or models. Inappropriate responses were totally unrelated comments with respect to the content of the teacher question, mand, or model.

Babbling (B): Babbling was defined as consonant-vowel syllables, marked by diversity of consonants, repetition of the syllables, and the adult-like intonation patterns used. Babbling was considered as a child vocalization which could follow teacher instructions, questions, mands for verbalization, models, or commentary. In addition, babbling was considered as a form of vocal initiation on the part of the child.

Unintelligible (~): When the child verbalized, but the verbalization was unclear or not at all understandable, (~) indicated unintelligibility. When it was possible to determine the general category of the child's utterance, it was indicated in parentheses.

Consequent events were defined as teacher verbalizations which followed a child utterance within four seconds. These teacher verbalizations excluded questions, instructions, mands for verbalization, and models. The definitions and their symbols used for recording verbal consequences by teachers were as follows:

Praise for utterance (+): A teacher comment indicating approval of the child's verbal/vocal response was scored as praise. This praise was only concerned with the child's response and not the content of the response, although it may have been concerned with the form of the response.

Praise not specifically related to the utterance (G): When a teacher made a positive statement after the child's utterance, but this comment was not specifically related to the child's form of the utterance, then (G) was scored. This praise usually took the form of "good," "alright," or "that's nice."

Negative for utterance (-): An adult comment which indicated disapproval of the child's verbal/vocal behavior was scored as (-).

Corrective Feedback (Cor): Corrective feedback was a statement to the target child, immediately following a child utterance, that the content of the utterance or the form of the utterance was incorrect.

Acknowledgement (A): Acknowledgement was defined as an adult's verbalization indicating attention to the child's utterance. Acknowledgement statements usually consisted of the words "yes," "unh-hunh," and "okay."

Nonverbal compliance by teachers (N): If a teacher fulfilled the verbal request of a child with a nonverbal action, (N) was scored as the consequent event. This was only scored if the teacher made no verbal reply to the child.

Commentary or conversation as a consequent event (Com): Any statement made by a teacher, following a child utterance, which is not included in any of the other definitions listed under consequent events, was scored as commentary.

Exact imitation (Im): When a teacher imitated what the child had previously uttered without changing the form or content of the utterance, (Im) was scored.

Expansion (E): Expansions were those teacher utterances, which, in response to the child's verbalization, retained the same word order as the child's utterance, and contained the same content words but used a greater number of functors, thus adding syntactic information.

Simple Expatiation (S): Simple expatiations were those teacher utterances, in response to the child's verbalization, which were simple sentences, added referential information to the child's verbalization, and did or did not have to retain the same word order or any of the words contained in the child's verbalization.

Complex Expatiation (C): Complex expatiations were those teacher utterances which, in response to the child's verbalization, were a compound, complex, or compound-complex sentence, added referential information to the child's verbalization, and did or did not retain the same word order or any of the words contained in the child's verbalization.

Categories of child utterances and consequent events are summarized in Table 1.

Reliability

Reliability of observations of teacher-child interactions was measured by the percentage of agreements on the number and types of child utterances and consequent events recorded by the experimenter and by a graduate student in speech pathology during six 15-minute sessions spaced throughout the data collection period. The graduate student in speech pathology had been trained for two sessions in recording types of interactions to be observed, prior to the beginning of the actual data collection. Reliability sessions were separated by at least four days and as much as eight days.

Interobserver reliability was computed using the following formula:

$$\frac{\text{number of agreements}}{\text{number of agreements} + \text{number of disagreements}} \times 100 = \text{percent reliability}$$

Reliability for the six sessions ranged from 89% to 100% agreement. The mean percentage of interobserver reliability was 91% agreement.

RESULTS

The data were analyzed according to the mean number of utterances produced by each child, the most frequently produced categories of child utterances per session, the mean percentage of utterances consequented per session, and the types of consequences used most

Table 1
Categories of Child Utterances and Consequent Events

Child Utterances	Consequent Events
Initiation (I)	Praise for Utterance (+)
Response (R)	Praise Not Specifically Related to the Utterance (G)
Obligatory Response (Ob)	Negative for Utterance (-)
Obligatory Response Required, But Inappropriate Response Made (✓)	Corrective Feedback (Cor)
Babbling (B)	Acknowledgement (A)
Unintelligible Response (~)	Nonverbal Compliance by Teachers (N)
	Commentary or Conversation as a Consequent Event (Com)
	Exact Imitation (Im)
	Expansion (E)
	Simple Expatiation (S)
	Complex Expatiation (C)

frequently. In addition, data were analyzed as to the categories of consequences different teachers used, and as to the categories of consequences used after different child utterances.

Table 2 presents the mean number of utterances produced by each child per session. It also shows the percentage of child initiations, responses, obligatory responses, inappropriate responses, babbling, and unintelligible responses with respect to the mean number of utterances. To compute the mean number of utterances produced by each child per session, the total number of utterances was divided by the total number of sessions the target child was observed. Child A produced a mean number of 27.25 utterances per session; Child B, 10.7 utterances per session; and Child C, 17.44 utterances per session. In examining Table 2 further, it appears that, for each child, babbling was the most frequent type of utterance scored. Babbling composed 71% of Child A's mean number of utterances; 85% of Child B's mean number of utterances; and 79% of Child C's mean number of utterances. Finally, it can be seen that 29% of Child A's mean number of utterances per session were verbalizations, as compared to 28% of Child C's and only 14% of Child B's.

The mean percentage of consequent events occurring per session for each child is presented in Table 3. It also displays the distribution of the mean percentage of consequent events into each category scored during data collection. This distribution is represented in percentages of the mean percentage of consequent events per session. The mean percentage of consequent events per session was the result of dividing the sum of the percentages of the utterances consequented per session by the number of sessions. Of the mean number of 27.25 utterances produced by Child A per session, 6.7 or 24.5% of these utterances were consequented by a teacher per session. The most frequently used consequent events for Child A were commentary (36%), praise not specifically related to the utterance (23%), and exact imitation (25%). Of the mean number of 10.7 utterances produced by Child B per session, 5.7 or 53.6% were consequented by a teacher per session. The most frequently employed consequent events for Child B were commentary (27%), praise not specifically related to the utterance

Table 2
Mean Number of Utterances Per Session and Percent Per Session of
the Various Utterance Types for the Three Children

Child	Mean Number of Child Utterances Per Session	Initiations	Responses	Obligatory Responses	Inappropriate Responses	Babbling	Unintelligible Responses
A	27.25	11	7	10	1	71	0
B	10.7	0	0	14	0	85	1
C	17.44	4	13	4	0	79	0

(27%), and acknowledgement (26%). Of the mean number of 17.44 utterances produced by Child C per session, 5.6 or 32.33% of these were consequented by a teacher per session, and the most frequently employed consequent events were commentary (52%) and exact imitation (31%). Across all three child subjects, the most frequent consequence produced by teachers was commentary.

The percentage of consequences used by individual teachers per session is displayed in Table 4. Additionally, this table shows the distribution of these percentages for each target child into each consequent event category scored during data collection. This distribution is represented in percentages of the mean percentage of consequent events produced by each teacher per session. Child A interacted with four teachers during the eight sessions in which data were collected. Teacher 1 consequented Child A's utterances only 3% per session, with 100% of these consequent events being exact imitation. The most frequently occurring types of consequences produced by the other three teachers for the utterances of Child A are as follows: Teacher 3 employed exact imitation (78%); Teacher 4 employed commentary (48%) and praise not specifically related to the utterance (36%); and Teacher 5 employed commentary (50%). Child B interacted with all six teachers during the 15-session data collection period. The most frequently occurring types of consequences produced by these teachers for the utterances of Child B are as follows: Teacher 1 employed praise not specifically related to the utterance (50%); Teacher 2 employed acknowledgement (42%); Teacher 3 employed commentary (45%); Teacher 4 used only commentary; Teacher 5 employed corrective feedback (33%) and acknowledgement (33%); and Teacher 6 employed exact imitation (40%). Child C interacted with four teachers during the nine-session data collection period. Teacher 5 produced no consequences to the utterances of Child C. The most frequently occurring types of consequences produced by the other three teachers to the utterances of Child C are as follows: Teacher 1 employed exact imitation (46%) and commentary (40%); Teacher 2 employed commentary (79%); and Teacher 3 employed commentary (67%).

In examining Table 4 further, results reveal that expansion accounted for 11% of the total percentage per session of the consequent

Table 3
Mean Percent of Consequent Events Per Session and Percent Per Session of
the Various Types for the Three Children

Child	Mean Percent of Consequent Events Per Session	Praise for Utterance	Negative to Utterance	Corrective Feedback	Nonverbal Compliance	Exact Imitation	Acknowledgement	Expansion	Simple Expectation	Complex Expectation	Praise Not Related to Utterance	Commentary
A	24.5	0	0	8	0	26	5	3	0	0	23	36
B	53.6	0	0	10	1	7	26	1	0	0	27	27
C	32.33	0	0	2	0	31	8	2	0	0	6	52

events produced by Teacher 3 to the verbalizations of Child A. Therefore, her expansions accounted for only 2.7% of the mean percentage of overall consequent events produced per session for Child A. Teacher 1 expanded 5% of Child B's verbalizations per session and 3% of Child C's verbalizations per session. For Child B, these expansions represented 2.7% of the mean percentage of consequent events produced overall per session, and for Child C, they represented 1% of the mean percentage of consequent events produced overall. Finally, it can be seen from Table 4 that no teacher produced any form of expatiation, either simple or complex, following the verbalizations of any of the three children.

Analysis of the different categories of consequent events produced by each teacher following the different categories of child utterances is presented in Tables 5a, 5b, and 5c. These results are reported in terms of a percentage of the total percentage of consequences produced by each teacher per session. Results of this analysis, with respect to Child A, are shown in Table 5a. These results revealed the following: Teacher 3 consequented Child A's verbal initiations most frequently with an exact imitation of the initiation (18%), although Teacher 3 did consequent initiations with expansions (3%). Teacher 4 most often consequented Child A's verbal responses with commentary (13%), obligatory responses with praise not specifically related to the utterance (23%), and babbling with commentary (18%). Teacher 5 consequented Child A's obligatory responses with commentary, and babbling responses were consequented equally with commentary, acknowledgement, and exact imitation. Overall, it appears that teachers consequented Child A's verbalizations more than his vocalizations.

As can be seen in Table 5b, Child B produced primarily obligatory responses and babbling during the 15-session observation period. Analysis of the consequent event categories employed by the six teachers who interacted with Child B yielded the following: Teacher 1 responded to Child B's babbling most frequently with praise not specifically related to the utterance (14%) and corrective feedback (4%), although Teacher 1 did consequent Child B's obligatory responses

Table 5a
Percent Per Session of Categories of Consequent Events Produced by Each Teacher
Following the Different Categories of Utterances Produced by Child A

Teacher	Consequent Event Category	Initiations	Responses	Obligatory Responses	Inappropriate Responses	Babbling
1	Exact Imitation	0	0	0	0	3
3	Exact Imitation	18	0	0	0	0
	Acknowledgement	3	0	0	0	0
	Expansion	3	0	0	0	0
4	Corrective Feedback	0	3	0	3	3
	Exact Imitation	0	0	3	0	0
	Praise Not Related to Utterance	0	0	23	0	0
	Commentary	0	13	0	0	18
5	Exact Imitation	0	0	0	0	3
	Acknowledgement	0	0	0	0	3
	Commentary	0	0	3	0	3

with expansions (1%). Teacher 2 responded to Child B's obligatory responses with exact imitations (3%), and to babbling with acknowledgement (14%), praise not specifically related to the utterance (14%), and commentary (7%). Teacher 3 responded to Child B's obligatory responses with acknowledgement, and to babbling with commentary (6%) and praise not specifically related to the utterance (4%). Teacher 4 responded to Child B's obligatory responses and babbling with only commentary. Teacher 5 responded to Child B's obligatory responses with exact imitation (1%), and to babbling with corrective feedback (3%) and acknowledgement (4%). Finally, Teacher 6 responded to Child B's obligatory responses with exact imitation (1%) and praise not specifically related to the utterance (1%), and to babbling with commentary (1%), exact imitation (1%), and acknowledgement (1%).

Analysis of the consequent event categories employed by the four teachers who interacted with Child C is presented in Table 5c. This analysis yielded the following: Teacher 1 responded to Child C's verbal initiations most often with exact imitation (4%), to verbal responses with exact imitation (8%) and commentary, to obligatory responses with exact imitation (10%), and to babbling with commentary (19%) and exact imitation (10%). In addition, Teacher 1 expanded 2% of Child C's verbal initiations. Teacher 2 responded most often to Child C's obligatory responses with acknowledgement, and to babbling with commentary (21%). Teacher 3 responded to Child C's babbling with commentary (4%) and praise not specifically related to the utterance (2%).

DISCUSSION

One finding of this investigation is that approximately 37% of the child subjects' utterances were consequented by teachers. As there is no previous data as to how frequently adults consequent the utterances of normal language-learning children and language deficient children, it is difficult to interpret this finding as a beneficial or damaging aspect of language learning in developmentally delayed children. It must be kept in mind, though, that the consequent events defined in this investigation were of the nondemanding type; that is, they do not require the child to make a verbal, vocal, or

Table 5b
Percent Per Session of Categories of Consequent Events Produced by Each Teacher
Following the Different Categories of Utterances Produced by Child B

Teacher	Consequent Event Category	Initiations	Responses	Obligatory Responses	Inappropriate Responses	Rabbling
1	Corrective Feedback	0	0	0	0	4
	Acknowledgement	0	0	1	0	3
	Expansion	0	0	1	0	0
	Praise Not Related to Utterance	0	0	0	0	14
2	Commentary	0	0	1	0	3
	Corrective Feedback	0	0	0	0	3
	Nonverbal Compliance	0	0	0	0	1
	Exact Imitation	0	0	3	0	0
3	Acknowledgement	0	0	0	0	14
	Praise Not Related to Utterance	0	0	0	0	7
	Commentary	0	0	0	0	6
	Acknowledgement	0	0	3	0	0
4	Praise Not Related to Utterance	0	0	0	0	4
	Commentary	0	0	0	0	6
	Commentary	0	0	1	0	4
	Corrective Feedback	0	0	0	0	3
5	Exact Imitation	0	0	1	0	0
	Acknowledgement	0	0	0	0	3
	Commentary	0	0	0	0	1
	Exact Imitation	0	0	1	0	1
6	Acknowledgement	0	0	0	0	1
	Praise Not Related to Utterance	0	0	1	0	1
	Commentary	0	0	0	0	0
	Commentary	0	0	0	0	1

Table 5c

Percent Per Session of Categories of Consequent Events Produced by Each Teacher
Following the Different Categories of Utterances Produced by Child C

Teacher	Consequent Event Category	Initiations	Responses	Obligatory Responses	Inappropriate Responses	Babbling
1	Corrective Feedback	0	0	0	0	2
	Exact Imitation	4	8	10	0	10
	Acknowledgement Expansion	0	4	0	0	0
	Praise Not Related to Utterance Commentary	2	0	0	0	0
2	Praise Not Related to Utterance Commentary	0	0	2	0	0
	Acknowledgement	0	8	0	0	19
	Praise Not Related to Utterance	0	2	0	0	2
	Commentary	0	0	0	0	2
3	Praise Not Related to Utterance Commentary	0	0	0	0	21
	Praise Not Related to Utterance	0	0	0	0	2
	Commentary	0	0	0	0	4
	Praise Not Related to Utterance	0	0	0	0	2

motor response. A demanding consequence, for example, would be a question, model, mand for verbalization, or instruction from the teacher requiring action on the part of the child. If such demanding consequences were included in this investigation, the number of utterances consequented by teachers would have probably been larger than the 37% figure found.

Traditionally, the use of nondemanding consequent events has been hypothesized to be beneficial in the acquisition of language, although there is very little evidence to support such a theory. This investigation showed that, across all three child subjects, commentary was the most frequently produced type of consequent event. Commentary, a form of nondirective speech, gives the child information without regard for the content or form of the child's utterance. This finding is supported by the results of Friedlander et al. (1972), who found that, in the environment of two 12-month-old infants and their parents, most of the language directed to the infants was of the nondirective type. In the Friedlander et al. study, as in the current study, the language level of the children was that of primarily babbling and a few words. It would appear, then, that the teacher subjects of the current investigation were responding to the children's utterances in a manner similar to that of the parents in the Friedlander et al. study, that is, dependent on the children's language level.

With respect to the use of commentary to consequent the utterances of all three children, one explanation arises. The children mostly babbled in initiating or responding to the teachers. Longhurst et al. (1974) found that mothers would typically model their own sentences rather than remain silent with respect to the total output of the child. Therefore, it may be expected that with low verbal children, adults would produce more nondirective speech.

When consequent event usage was analyzed in accordance with types of child utterances, once again it was found that, with the exception of exact imitation, teachers used primarily nonspecific types of consequences. Both the verbalizations and the vocalizations of the three children were found to be consequented primarily by commentary, praise not specifically related to the utterance, and acknowledgement. This means that, aside from nondirective types of responses such as

commentary, teachers responded to the children's utterances with such words as "okay," "yes," and "good." It was found that no teachers consequented children's utterances with praise such as "good talking," or negative responses, such as "I don't like the way you said that."

Each child received only a small amount of corrective feedback after an utterance.

Several explanations are possible as to why teachers responded with nonspecific consequent events. One explanation deals with an idea discussed previously; that is, in interacting with children producing low verbal/vocal output, adults may produce more nondirective speech. In the case of nonspecific types of responses, the teacher may wish to acknowledge that the child said something, but the content of the utterance may not be semantically significant enough for the teacher to make a specific response, such as an expansion of the child's utterance. Another explanation of this phenomenon may be that teachers respond differently to children who are language deficient. Several studies have documented that adults, in fact, do address language deficient children or low-linguistic level children differently than children acquiring language at a normal rate (Hoskins, 1974; Marshall et al., 1973; Riedl, 1972; Siegel, 1963b). Additionally, Granowsky and Krossner (1970) found that preschool teachers use simpler and shorter sentences in speaking to their students. This is a result that is also found in many parent-child interaction studies. Hetenyi (1974) found that the mother of a five-year-old, nonverbal child tended to praise her child's verbal/vocal attempts less than using other more demanding types of responses. As the present investigation just examined the occurrence of nondemanding consequent events, it is possible that teachers responded to the children's utterances with more specific and demanding types of consequences, such as questions or instructions for nonverbal behavior. A final explanation of teachers' tendencies to use nonspecific consequences in response to the utterances of the child subjects may lie in the possibility that the teachers, spending only a limited amount of time per day interacting with the children, may not be able to discriminate between the children's vocalizing and verbalizing. An example of

this was observed consistently with Teacher 2, who was attempting to toilet train Child B. The teacher would give a mand for the child to say the word "potty," and the child would say something to the effect of /pa/. This teacher would accept this as an approximation of the word, but later would accept it as a form of babbling. Unfortunately, there is no literature at present to support this explanation.

Certain specific consequent events were examined. They were exact imitation, expansion, and simple and complex expatiation. As stated previously, it is these types of consequences that are believed to be beneficial in the child's acquisition of adult grammar. Also, expansion and simple and complex expatiation have been suggested as useful techniques for the remediation of language deficiencies (Muma, 1970). In the present investigation, it was found that the teachers used no simple or complex expatiations in response to the children's utterances. An explanation of this absence may lie in the fact that only verbalizations can be expatiated, and that the children produced primarily babbling responses with few one- or two-word responses. Longhurst et al. (1974) found that mothers of three-year-old children used expatiation more than mothers of two-year-old children. Keeping in mind that a three-year-old child will probably produce utterances three words in length or longer, it seems feasible that the teacher subjects of the current investigation would display very little, if any, expatiation of these children's utterances.

On the other hand, expansions of the children's utterances occurred at a rate of less than 3% per session. When considering other data with normal language-learning children, this figure appears to be accurate with respect to the child subjects' language levels. Longhurst et al. (1974) found that mothers of two-year-old children expanded 4.3% of their children's utterances. Seitz and Stewart (1975) found that mothers of two-year-old children expanded their children's verbalizations approximately 2.8% of the time. Finally, Nelson (1973) reported that mothers repeat and expand their two-year-old children's utterances less than 6% of the total responses. It would appear then that the teacher subjects of this investigation

were expanding the utterances of the developmentally delayed children with the same frequency as do mothers of normal children at the same language levels.

In examining the data regarding the occurrence of exact imitations in response to the children's utterances, it was found that exact imitations occur from four to ten percent per session. This figure is slightly higher than that found by Nelson (1973). Perhaps this phenomenon, too, can be explained by saying that the teachers were responding to the language levels of the children, who were functioning linguistically at lower levels than other two-year-old children. In addition, there is some evidence that the use of exact imitation may be beneficial in increasing the amount and variety of the children's vocalizations. Seitz and Marcus (1976) found that, by imitating the vocalizations of a young hearing impaired child, the amount and variety of vocalizations produced by the child could be increased.

Aside from the findings reported about consequences produced in response to the utterances of all three child subjects, two other results of the investigation proved to be interesting. One of these dealt with the amount of vocalizations produced by Child B. It was found that Child B vocalized more in the restroom setting than in the classroom setting. This finding could be explained two ways. Child B was reinforced for proper toileting with an M & M, and this reinforcement may have, in turn, caused an increase in the child's vocalizations. Secondly, perhaps the change of setting afforded Child B more opportunities to vocalize. A second interesting finding was that teachers consequented the utterances of Child A less per utterance than those of the other two less verbal children. Although all three children received responses to approximately the same number of utterances per session, Child A responded to less per utterance. This result is very difficult to explain. One would expect the teachers to respond more to Child A rather than to the other two children. It is possible that some variable other than the amount of utterances the child produced was present when the teachers did or did not respond to this child.

As for implications for language training presented by the findings of this investigation, several alternatives appear. One alternative might be in the use of exact imitation to consequent

primarily vocal children; that is, to consequent the vocalizations of the of these children with no or few words. As noted previously, Seitz and Marcus (1976) found that their hearing impaired subject imitated the vocalizations of adults when the adults imitated the vocalizations of the child, thus initiating a form of "vocal play." Such a technique could also be used to increase the amount and variety of the child's vocalizations. Yet, there is very little literature as to the effect of exact imitation when used with low verbal/vocal children.

Another treatment technique suggested by the results of the current investigation would be the use of expansions and expatiations. These techniques have been suggested for use in treatment of language deficiencies by other authors (Muma, 1970; Bandura & Harris, 1966; Brown & Bellugi, 1964). Although the teachers in the current investigation used these techniques to the extent that would be expected considering the children's language levels, perhaps an increased dose of them would bring about an increased amount of verbalizations by such children. The use of these techniques, though, is dependent on the amount of verbalizations the child produces, and their effects on the normal child's acquisition of language need to be studied further.

It seems doubtful that nonspecific consequent events have much effect on the developmentally delayed child's acquisition of language. If anything, nonspecific consequent events probably serve to acknowledge that the child said something, although the role of these types of responses needs to be examined further.

It would be presumptuous to draw firm conclusions from the findings presented in this investigation. As stated in the introduction, this investigation represents an initial attempt in a series of studies examining consequent events and the possible manipulation of them to facilitate language acquisition in developmentally delayed children. Future investigations should be designed to examine the role of demanding consequent events and nonverbal consequent events. Once these consequent events have been studied, functional reinforcers to children's utterances will have to be identified and manipulated according to their occurrence in the child's environment, their effects

on the child's acquisition and generalization of language skills, and to the skills that need to be trained in order to produce natural reinforcers from teachers and parents. Finally, programming should be implemented and assessed with respect to the findings of previous investigations.

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TEACHERS' RESPONSES TO THE VERBALIZATIONS/VOCALIZATIONS
OF DEVELOPMENTALLY DISABLED PRESCHOOL CHILDREN

by

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ABSTRACT

The purpose of the current investigation was to describe the nondemanding consequent events following the verbalizations/vocalizations of three developmentally disabled preschool children. The subjects included three male children (ages 4-7, 4-2, and 2-10) and the six teachers of a preschool for developmentally disabled children. Developmental language level, determined by performance on one of two language scales administered to the two preschool teachers, was below the two year age level for all three children. Numerous 15-minute observations were conducted at the preschool when a teacher and the target child were engaged in an activity known as "tablework." Verbal/vocal interactions between teachers and the target child were coded and recorded during the 15-minute observation period. Child utterances were coded into one of seven categories, and teacher verbalizations were coded into one of ten consequent event categories. Analysis of teacher-child interaction data revealed that less than 37% of the children's utterances were consequented by teachers. For all three child subjects, the most frequently occurring category of consequences was commentary by the teachers. Teachers consequented the utterances of the two less verbal children more often than the utterances of the most verbal child subject. Expansions of the children's verbalizations comprised 3% or less of the total number of consequent events produced per session by teachers. The teachers produced no simple or complex expatiations as consequences to the children's verbalizations. Results of this investigation were compared to those found in other adult-child studies. Implications for language training were discussed.