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Generalization of Language Behaviours in a
Language Delayed Child

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Although there is general consensus that language acquisition follows a standard sequence of development in normal children (Berry, 1969; Cazden, 1968; Eisenson & Olgilvie, 1968; Ginsburg & Oppen, 1969; Lenneberg, 1966; McNeil, 1970; Myklebust, 1957; Slobin, 1970), whether or not such a sequence is applicable to a language delayed population is controversial (Menyuk, 1975). Menyuk (1975) suggests that there exist two major orientations to remediation strategies in language delayed children, the developmental and behavioural positions. The developmental orientation takes the position that normal language acquisition encompasses a sequential pattern of acquisition of language behaviours, a pattern which is generally standard, although with some variations from child to child. For children evidencing a delay in their progression through this hierarchy of language behaviours, the developmentalists recommend early intervention programs. Intervention is advocated as soon as the child is observed to be deviating from normal language acquisition sequences or rates. Remediation, in a developmental framework, involves presenting the child with activities reflecting a normal sequence of development.

The behavioural approach similarly suggests early intervention in language behaviours employing operant conditioning methods and teaching behaviours of functional importance to the individual important for his/her survival, rather than progressing in a developmental sequence. The behaviourists do not assume that effective language learning is established only by progression through sequences observed in normal language development.

The present study attempts to borrow aspects from the developmental and behavioural orientations. An attempt is made to ascertain if there is a differential rate of generalization of language tasks of varying functional levels when language tasks are taught utilizing operant conditioning techniques with a language delayed/behaviour disordered five-year-old boy. Operant conditioning methodologies are taken from the behavioural orientation along with the assumption that language behaviours can be taught through operant conditioning methodologies. The two language tasks of different functional language acquisition levels are chosen based on observed sequences of development for normal children (Singer, 1975). The hypothesis investigated in the present study is that the subject will not generalize the higher level task as consistently or with as great a frequency as the lower level task, supporting the concept of the efficacy of developmental sequencing in

remediation as proposed by a developmental orientation. Generalization of acquired language tasks to other stimulus conditions is one of the most crucial aspects of efficacious language learning. Without this element, the child is extremely limited in his/her communication skills, independence, and functioning. Determining some of the features contributing to increased generalization of learned tasks is a prerequisite to creating a learning environment and strategy most conducive to maximum generalization of learned tasks. The primary question explored in this study is: Is there a differential level of generalization of language abilities with reference to training of language tasks, one at the child's functional language level and the other above this level?

Language delay serves as a generic term for many variations of language behaviours which in some way differ from normative language behaviour. Language delay encompasses both expressive and receptive language development, i.e. production of language and understanding of language. The focus of the present study is on expressive language, but it can not be totally separated from receptive language. Menyuk (1971) stated that language delay usually includes delay in the beginning of acquisition, slowness in the process of acquisition, and cessation of this process prior to attainment of complete adult linguistic competency. Delayed expressive language would usually include late initiation of speech usage, slowness in the acquisition process, and cessation of the acquisition process prior to attaining a normal level of competency. For the purposes of the present study, language delay is defined as a lag in language development of 18 months or more as compared to normal language development, in addition to late initiation of speech usage and slowness in the acquisition process. Menyuk's (1971) final criteria of premature cessation of the language acquisition process is not included in the present study because the focus is on a child still within the acquisition process.

Method

Subject

At the time of the study, the subject was a language delayed/behaviour disordered five-year-old boy. The subject exhibited autistic-like behaviours; hand flapping, rocking, spinning of toys, hand biting, inattention to presented tasks, and tantruming behaviours. Verbalizations consisted primarily of echolalia although the subject did voluntarily use a limited number of nouns, adjectives, and verbs in single and two-word combinations. The subject was enrolled in a university affiliated preschool program for exceptional children at the time of the study and at the initiation of this study he had attended this program for 18 months.

Apparatus

The research was conducted in a university affiliated preschool program for exceptional children. Baseline and treatment

sessions were conducted in an eight by seven foot room, observable through a one-way mirror and sound equipment. Generalization probe sessions occurred in the previously described room and in a second room similar to that used for baseline and treatment sessions. The subject was seated facing the experimenter with a table between them. Training stimuli (drawings) were presented to the subject by being placed on this table.

Procedure

Baseline. The subject was administered the Peabody Picture Vocabulary Test (Dunn, 1959), evidencing a raw score of 21 and a maturational age, M.A., of 2.6 years. A developmental sequence of receptive and expressive language behaviours, the Language Acquisition Sequence (L.A.S.) (Singer, 1975), was also employed. It is derived from sources outlining normal language development (Berry, 1969; Eisenson & Olgilvie, 1968; Lenneberg, 1966; McNeil, 1966; Myklebust, 1957; Schiefelbusch, 1963). It is important to note that the age levels specified for the particular developmental levels are only estimates; and there is much variation, even among a normal population of children, in the rate of development and the ages at which specific levels of development are attained (Cazden, 1968; Schiefelbusch, 1963). The expressive language segment of the L.A.S. was used in the present study as a criterion-referenced test, that is, as a non-standardized assessment tool, used to pinpoint specific competencies and weaknesses of the subject (Alkin, 1974). Within the area of language functioning, there is a lack of adequate standardized tests, particularly for language behaviours appearing early in development. Additionally, for the purpose of the present study, identification of specific areas of competency and weaknesses for the subject was essential in establishing levels of training to be employed. The L.A.S. met these needs.

Observations were made of the subject's language behaviours in structured sessions in the preschool, small group and individual sessions, and in play sessions in the preschool. The subject's level of functioning on expressive language tasks was estimated as being 24.0 to 30.0 months, based on the above described developmental sequence of language behaviours. This is consonant with the subject's M.A. of 2.6 years as evidenced on the Peabody Picture Vocabulary Test (Dunn, 1959).

A language task at the subject's functional level of expressive language development, which the subject did not possess, was determined by presenting the subject with drawings depicting linguistic concepts and simultaneously presenting the question verbally: "What is this?". The pictures called for responses such as "long fork", "short fork", or "dog", "dogs". The subject exhibited a 0% correct response rate on pictures depicting singular and plural objects (a task usually acquired by a normal child of 29 months of age). Using the above method-

ology, an expressive language task above the subject's functional language level, but not in his expressive language repertoire, was determined. This was the use of long/short as an adjective (a task usually acquired at 40 months of age in normal development).

Materials. Stimuli presented to the subject in baseline and treatment sessions were black and white drawings of objects in his naming repertoire although the linguistic concepts depicted were not in his repertoire, i.e. the subject could correctly identify a drawing of a dog with the verbalization "dog" but did not add the plural allomorph /z/ when a drawing of two dogs was presented. Drawings were presented on 4 1/2 by 6 inch white cards.

Training sessions. The subject was trained on the previously described two categories of linguistic tasks not within his expressive language repertoire, one at his functional language level, i.e. plurals, and one above this functional language level, i.e. long/short. Objects presented were within the subject's naming repertoire. Training sessions were 20 minutes long, 10 minutes spent on each linguistic category of tasks. Training sessions occurred three mornings weekly. Order of presentation of the two linguistic concepts was random within a particular training session. Additionally, the order of presentation of drawings within each linguistic category was random. The subject was trained on the language tasks in a 1:1 setting with the experimenter. Operant conditioning methods were employed in these training sessions. Verbal praise, physical contact in the form of hugging and tackling, and smiling by the experimenter were used for all correct verbalizations by the subject in response to presentation of the drawings and the verbal question: "What is this?". Incorrect responses by the subject were followed by a verbal "no" by the experimenter. Shaping procedures and modelling of desired verbalizations with gradual fading of these prompts were also implemented in establishing desired responses. These procedures were similar to those previously outlined by Lovaas (1966) and Risley and Wolf (1967). Verbal prompts to cease inappropriate behaviours such as self-stimulation, self-destruction, and inattention, were employed contingent on these inappropriate behaviours occurring. A time-out procedure was used if after three verbal prompts, the subject still engaged in the above inappropriate behaviours. The time-out procedure consisted of the experimenter leaving the room and returning 30 seconds after the inappropriate behaviour had ceased. Presentation of training stimuli then resumed. Training sessions continued until the subject had reached a criterion rate of 100% correct responses on the two language tasks. The linguistic category of plurals was acquired more quickly than that of long/short by the subject. Training continued on plurals until the subject reached a 100% criterion

performance level on long/short tasks also.

Generalization probe sessions. Subsequent to the subject achieving a 100% correct response rate on the two linguistic categories presented in training sessions, the subject was exposed to the generalization probe situations. The following generalization probe conditions were employed:

Condition 1: Presentation of color versions of the original training picture cards with the training teacher (experimenter₁) in the original training room.

Condition 2: Presentation of the original black and white training pictures by an experimenter other than the original trainer (experimenter₂) in a room other than the original training room, but with the same physical characteristics as the original training room.

Condition 3: Presentation of black and white drawings depicting objects not used in the training sessions but with similar concepts as those used in training sessions, i.e. plurals and long/short, by experimenter₁ in the original training room.

All of the stimuli in the generalization probe conditions were based on the two categories of linguistic tasks used in the training sessions.

Additionally, the subject's spontaneous utterances, with reference to the trained expressive linguistic categories, were recorded during group play sessions in the preschool, previous to, during, and subsequent to the language intervention program.

Recording. Frequency counts of the subject's correct response rate to presented picture stimuli were made by experimenter₁ during each baseline, training, and generalization probe session. Experimenter₂ served as a second observer in seven of these sessions picked randomly. Observations were also made of the subject's utterances during group play sessions. Experimenter₁ observed 20 play sessions; 2 during baseline, 15 during the training phase, and 3 during the generalization probe phase. Experimenter₂ observed 9 of these sessions.

Design. The design employed in the present study is a modification of a single-subject simultaneous-treatment design as described by Browning and Stover (1971) and McCullough, Cornell, McDaniel, and Mueller (1974). The design employed in the present study is as follows:

A BCBCBC...BC D(BC)

A indicating behavioural baseline; BC...BC, treatment conditions or training sessions in random order of presentation; and D(BC), generalization probe.

Results

Recording

Reliability between experimenter₁ and experimenter₂ was calculated based on their frequency counts of occurrence or non-occurrence of the subject's specific verbalizations with refer-

ence to the linguistic categories of tasks being trained, i.e. plurals, long/short. Agreement between the two experimters was 1.00 during baseline, training, and generalization probe sessions. Reliability was also 1.00 for play session observations.

Baseline

The subject's score on the Peabody Picture Vocabulary Test (Dunn, 1959), in conjunction with his performance on the L.A.S., indicated a functional expressive language level of 24 to 30 months. Table 1 lists drawings of objects presented to the subject determined as being within his expressive language naming repertoire.

Table 1

Objects Used Depicting Two Linguistic Concept Categories

| Objects Used for Depiction of Plurals | Objects Used for Depiction of Long/Short |
|--|---|
| airplane | bed |
| *ball | *car |
| *bird | *fence |
| *book | fish |
| *boy | fork |
| broom | hamburger |
| carrot | hammer |
| *cup | house |
| *dog | *knife |
| drum | lamp |
| *flower | *pants |
| *guitar | *pencil |
| *hand | *scissors |
| pig | *snake |
| pot | sock |
| *shirt | *spoon |
| telephone | table |
| *tree | *train |
| T.V. | wagon |

Note. Asterisked items are those used in training sessions; the other items served as untrained stimuli for the generalization probe sessions.

Column 1 items are those used to depict the concepts of plurals. Column 2 items are those used to depict the concept of long/short.

Table 2

Use of Plural and Long/Short Verbalizations in
Baseline and Intervention Sessions

| Linguistic Category | Days | | Weeks | | | | |
|---------------------|-----------------|---|---------------------|----|-----|----|-----|
| | 1 | 2 | 1 | 2 | 3 | 4 | 5 |
| | Baseline (in %) | | Intervention (in %) | | | | |
| Plurals | 0 | 0 | 88 | 77 | 100 | 96 | 100 |
| Long/Short | 0 | 0 | 66 | 55 | 77 | 88 | 100 |

The first two columns of Table 2 illustrate the percentages of the subject's correct responses to drawings depicting the linguistic categories of plurals and long/short during baseline; the first row being representative of plurals; the second row, long/short. A 0% correct response rate was exhibited during baseline by the subject for both linguistic categories.

Training

Weekly mean percent of correct response rates for plurals and long/short are shown in the third through seventh columns of Table 2. Table 2 shows the subject exhibiting a correct response rate of 100% for plurals by the third week. Training continued for two more weeks until the correct response rate for long/short was 100%. The subject's correct response rate for plurals (fourth week) decreased to 96%, and in the fifth week, once again was 100%. There was a decline in correct response rates for both plurals and long/short in the second week. Training was interrupted between the first and second weeks for two weeks due to a school vacation.

Play Sessions

Throughout baseline, training, and generalization probe sessions, the subject demonstrated no spontaneous usage of plurals or long/short during play sessions.

Generalization Probes

Table 3 illustrates the subject's correct response rate to plural and long/short stimuli during generalization probe sessions. The subject demonstrated a higher correct response rate with regard to plurals as opposed to long/short in 2 out of 3 generalization probe conditions. In Condition 1 of the generalization probes, the subject exhibited a 0% correct response rate for both plurals and long/short.

Table 3

Use of Plural and Long/Short Verbalizations in
Generalization Probe Sessions

| | Generalization Probe Conditions (in %) | | |
|---------------------|--|-----|----|
| Linguistic Category | 1 | 2 | 3 |
| Plurals | 0 | 100 | 82 |
| Long/Short | 0 | 78 | 20 |

Home Observations

One week subsequent to the completion of the generalization probe phase of the study, the subject's mother was questioned as to any spontaneous verbalizations by the subject with reference to the two trained linguistic categories, plurals and long/short. The mother reported no verbalizations within these categories. Her observations of no verbalizations of the forms plurals and long/short continued for one month. After this time, she began to note that the subject was using plurals appropriately a few times per week. No precise data frequencies were recorded. At three months and six months after the termination of the study, the mother reported appropriate use of plurals increasing, but no use of long/short. Nine months after termination of the study, the mother reported that the subject was continuing to use plurals appropriately and was infrequently beginning to use long/short forms, once every few weeks.

Discussion

Data from the training sessions indicates that specific language behaviours can be taught to a language delayed/behaviour disordered child through operant conditioning methodologies. This is consonant with previous findings with reference to schizophrenic children (Lovaas, Berberich, Perloff, & Schaeffer, 1966), autistic children (Hewett, 1965; Risley & Wolf, 1967), mentally retarded children (Guess, 1969; Guess, Sailor, Rutherford, & Baer, 1968; Schumaker & Sherman, 1970; Stremel, 1972), and psychotic children (Salzinger, Feldman, Cowan, & Salzinger, 1965).

The hypothesis examined in the present study, that differential generalization of trained language tasks will occur with reference to the functional expressive language level of a language delayed/behaviour disordered child when one language task is at that child's functional language level and the other task is above that level, was borne out in all but Condition 1 of the generalization probes. More specifically, it was suggested that the subject would exhibit a greater frequency of

correct responses to stimuli presented for the lower level task as opposed to the higher level task. The findings of this study support the hypothesis in Condition 2 where the subject was exposed to untrained picture stimuli by experimenter₁; and Condition 3, presentation of trained picture stimuli by experimenter₂. No differential effect was demonstrated in Condition 1, presentation of color versions of trained stimuli by experimenter₁. Failure to observe this effect in Condition 1 may be explained in that the use of color was sufficiently distracting so that the subject focussed only on the colors and not on the linguistic categories dealt with, i.e. plurals and long/short. Absence of generalization of trained linguistic concepts to spontaneous speech in play sessions can be attributed to lack of similar stimuli with reference to training stimuli. Additionally, more stimulation was available to the subject during play sessions, possibly precluding a focussing of attention on trained linguistic concepts in the play sessions.

Differential rates of generalization in Conditions 2 and 3 of the generalization probes, with greater generalization evidenced with plurals in both conditions, lends strong support to the hypothesis of the present study. It is suggested for normal children that language acquisition progresses in a developmental sequence (Berry, 1969; Cazden, 1968; Eisenson & Olgilvie, 1968; Ginsburg & Opper, 1969; Lenneberg, 1966; McNeil, 1970; Myklebust, 1957; Slobin, 1970). A developmental approach, with reference to a language delayed population, as outlined by Menyuk (1975), advocated remediation of language behaviours in the sequence observed in normal development. The present study lends support to this position, suggesting that generalization of linguistic concepts is facilitated when those concepts taught are at the specific child's functional language level or stage of development.

A successful remediation method, borrowing aspects from the behaviourist and developmental approaches, as outlined individually by Menyuk (1975), was demonstrated through effective training of linguistic concepts using operant conditioning methodologies. The developmental position received support in this demonstration of differential rates of generalization based on the developmental level of the tasks.

The subject's mother reported differential rates of generalization of the trained linguistic concepts one, three, six, and nine months subsequent to the termination of the study, again supporting the idea that generalization of linguistic concepts is more readily established in tasks at the child's functional level of language development. Appearance of generalization of the higher level language task, long/short, nine months subsequent to the study, may be explained by the process of maturation of the subject with the passage of time. Further language development during these nine months may have brought

the subject closer to a level of development in which the linguistic concept of long/short could more adequately be acquired.

Remediation of language behaviours in language delayed children has traditionally fallen within the behaviourist and developmental frameworks (Menyuk, 1975). It would appear that an effective intervention strategy might involve a synthesis of these two orientations, permitting acquisition of language behaviours and subsequent generalization of those behaviours; generalization being necessary for communication in situations other than the training environment. Further research in this area is suggested including more complete isolation of important variables in the generalization process. Replication in studies with other populations of language delayed children, in terms of disorders and stage of development, would be valuable in determining similarities and differences in acquisition and generalization patterns.

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