A Language Development Program for Severely Handicapped Children

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Abstract: This article describes a program based on behavioral principles to develop verbal behavior in severely handicapped young children and designed to be conducted by college students. The results indicate that college students are able to apply their technical skills, obtained mainly from an increasing number of behaviorally oriented courses offered at the undergraduate level, and make important contributions to the language development of severely handicapped children. These findings have implications with respect to the shortage of technical personnel in institutions and treatment centers.

An effective program to produce functional speech or to stimulate language development in severely handicapped nonverbal children generally requires intensive individual attention. Unfortunately, in most educational settings, especially where the population consists of low functioning children, sufficient professional staff is not available to perform this function. Consequently, various nonprofessionals have been used to alleviate this shortage of personnel. For example, Guess and his associates (Guess, Rutherford, Smith & Ensminger, 1970; Guess, Smith, & Ensminger, 1971) in their work with institutionalized retarded children demonstrated that nonprofessionals can be taught to carry out effective language development programs designed mainly to remedy more general deficits in communicative speech. Fredericks, Baldwin, McDonnell, Hofmann, and Harter (1971) have taught parents to use behavior modification techniques to instruct their severely retarded children at home in a variety of skills, including language. Ludtke and Elliott (1969) have taught volunteers to function as adjuncts to the professional staff of institutions in a number of different areas. They noted that college students would probably function well in the speech therapy program.

According to a recent review by Gruver (1971), college student volunteers in mental health programs can apparently provide positive therapeutic gains, although firm conclusions as to their effectiveness must await more empirical evidence. It was also noted that one reason for these positive outcomes may be the ease with which college students are able to relate to and become involved with patients, especially children, as well as their more intense application to the tasks at hand.

Cytryn and Uihlein (1965), taking advantage of these characteristics, asked high school and college student volunteers to establish positive relationships with retarded children. Although the instructional program for the volunteers was generally unstructured and the total time spent with each child not extensive, the children did apparently progress in terms of their social adjustment and interpersonal relationships.

In more behaviorally oriented approaches, Davison (1965) taught college students to apply learning principles to the behavior of autistic

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number of undergraduates for 1 week periods in an extensive program which used operant techniques to teach autistic children a variety of skills. Similarly, Thorne and Shinedling (1970) reported a study in which college students were involved in a training program designed to apply behavioral procedures to modify various target behaviors of retarded children. Results indicated that success occurred in those instances in which the task was to establish a behavior, whereas attempts to eliminate a behavior were unsuccessful.

In recent years, a substantially larger number and wider variety of courses dealing with behavioral principles and their applications have been offered to students at the undergraduate level. This state of affairs has produced a pool of individuals who have the basic technical skills, above and beyond their favorable personality characteristics, that may enable them to function more effectively as nonprofessionals in mental health and educational programs.

As indicated earlier, programs designed to develop verbal behavior in children whose functional language is either nonexistent or minimal requires intensive individualized attention, especially during the early stages. Consequently, a behaviorally based program of language training for severely retarded and autistic young children carried out by undergraduate college students was devised and organized. It was anticipated that the outcome of this program would provide valuable information on the general effectiveness of this source of behaviorally trained nonprofessionals.

Method

Subjects and Setting

The children participating in the program consisted of one institutionalized and seven noninstitutionalized severely handicapped children attending day school at the National Children's Center in Washington, D.C. The diagnoses were varied but included autism and different forms of brain damage. Most of the children, 4 to 7 years of age, were not amenable to formal testing. Their verbal repertoires were limited, consisting of isolated words and occasional phrases in some but unintelligible and apparently nonfunctional sounds in most. In addition, the majority of the children did not generally engage each other in social interac-

hours, 5 days a week. The classroom staff consisted of a teacher and a teacher's aide.

Program

The program was conducted by 10 undergraduate college students who spent from 3 to 6 hours per week working with the children for a period of 1 semester. Students were not assigned to individual children but worked with all children, although not every day. They spent approximately 20 minutes with each child per session.

After the students became familiar with the setting and behavior of the children, specific target behaviors were defined for each child and procedures to establish those behaviors were outlined. Children were initially categorized on the basis of their current repertoires, which were determined by a system consisting of an idealized progression of teaching steps as described by Sloane, Johnston, and Harris (1968). Since most of the children failed to emit any intelligible sounds with sufficient frequency and did not imitate speech sounds or motor behavior, they were placed at the beginning of the progression. The initial steps in the sequence were designed to establish eye contact and imitation of simple motor responses.

Procedures

The teaching procedures were adapted from those described in various reports (Baer, Peterson, & Sherman, 1967; Lovaas, Berberich, Perloff, & Schaeffer, 1966; Metz, 1965; Sloane, et al., 1968). Since all of the college students had completed at least one intensive course in behavior principles and were enrolled in a more advanced course, they were generally familiar with these procedures. Additional readings, discussions, and instruction in specific procedures were provided when necessary. The basic task structure consisted of three elements. First, the instructor provided a discriminative stimulus which was generally presented in the form of the verbal statement "do this" or "say this." Second, the instructor modeled the scheduled behavior. Finally, if the child imitated the modeled behavior or produced an acceptable approximation, reinforcement was immediately provided.

For the motor imitation task, it was first necessary to physically guide the child through

havior until eventually the entire response occurred without external support. Eye contact was established using the method of successive approximations with the child's name functioning as the discriminative stimulus. After successful completion of motor imitation, the children were taught to imitate movements of their vocal musculature, for example, opening and closing of the mouth. As suggested by Lovaas et al. (1966), speech imitation was first introduced by choosing specific sounds based on the frequency of that sound currently emitted by a child, selecting those sounds that had a prominent visual component which could be exaggerated, such as /a/, or including those sounds that lend themselves more readily to physical prompting. If this step was successfully accomplished, procedures for establishing sound chains and labeling objects were initiated. Children whose verbal repertoires were more advanced were introduced to the labeling tasks directly, although some motor imitation training was conducted for each child in order to provide instruction regarding the structure of the task.

A record of each child's trial by trial performance for each session was maintained. This record contained a considerable amount of information, including (a) the target behavior for that session, (b) the specifics of the teaching method employed (e.g., extent of physical guidance), (c) report of whether the child's response approximated or exactly matched the topography of the model, (d) the reinforcers used, (e) the schedule of reinforcement, (f) the type and extent of any inappropriate behavior, and (g) recommendations that might facilitate teaching for the next instructor who works with that child.

These daily record sheets provided the main vehicle for communicating information about a child from instructor to instructor. This was essential since each instructor worked with every child. The day to day organization and direction were carried out by the teacher and the teacher's aide who determined priorities, pointed out when a new target behavior or procedure had been recommended, and indicated any problems or other information that might affect the outcome of that day's teaching. In addition, comments by other professional staff were communicated via the teaching staff by providing written notes on a child's record

The results strongly suggest that college students can apply their technical skills as behavioral psychologists and make important contributions to the language development and general well being of severely handicapped children. Of the eight children involved in the project, five made important progress in that they moved at least to the next level in the Sloane et al. (1968) progression, whereas three children showed little or variable change.

Two children especially showed dramatic changes. One child, Paul, who had been variously diagnosed over the years as suffering from brain damage, autism, and cultural-familial retardation, had not progressed at all in class before the program was initiated. Generally, he presented a picture of social isolation and depression, and in addition, no imitative behavior nor intelligible sounds of any sort were observed. With various foods and candies as reinforcers, Paul moved through the teaching progression, beginning with the imitation of simple motor behaviors. He then progressed to imitative movements of the vocal musculature and finally to various sounds. Presently, Paul attempts to imitate any sound or word modeled for him, and his performance can be adequately maintained on a lean variable ratio schedule of reinforcement. In addition, he appears to be considerably more content and alert in class and participates more readily in social activities.

A second child, Robert, a 7 year old autistic boy, was extremely hyperactive, rarely engaging in any form of social or communicative behavior. A program designed to establish eye contact with Robert was devised. It was felt that a successful program for this behavior would be a considerable accomplishment since previous programs to bring any of Robert's behavior under stimulus control were unsuccessful. In previous programs a variety of possible reinforcing stimuli, including numerous foods and candies, even when given after deprivation, did not effectively change his behavior. Observations by project members indicated that tactual stimulation and access to physical activity might function as effective reinforcers for Robert. With his name serving as a discriminative stimulus for eye contact, this behavior was successfully shaped. It appeared that these reinforcers were extremely effective. In addition, adults in general seemed to acquire secondary reinforcing value for him, probably due to the

playing behavior that suggests anticipation of reinforcement, such as extending his arms (usually associated with being raised into the air) and sustaining eye contact.

The failure to establish effective programs for three of the children was the result of many factors, the most significant of which was probably the difficulty in eliminating the extensive repertoires of inappropriate and disruptive behaviors manifested by these children. An appreciation of this can be gained from the following comments written on the record forms by one of the students about a particularly difficult child:

> Today was a test. Barbara went through her entire repertoire of attention getting behaviors, beginning with arm waving and gyrating to dropping things, belching, throwing saliva, self-induced vomiting, taking off shoes, banging head, banging the metal funnel, finally smiling.

He continues further on:

> It is also interesting to note that she appeared to know exactly what she was doing and did not seem anxious about the situation—it was more of a contest.

The techniques used to eliminate or decelerate behaviors consisted of a combination of ignoring inappropriate behaviors and reinforcing behaviors that were both appropriate and incompatible with the inappropriate ones. Occasionally, strong verbal reprimands were employed. Some success was reported in using these techniques, as indicated in the following comments by the same student working with Barbara at a later time:

> Getting very consistent response with motor imitation. Attempted to mix in verbal but she became very anxious. Otherwise she was very quiet, relaxed, and engaged in very little disruptive behavior—a marked change from earlier sessions.

Nevertheless, the changes in her behavior were not consistent and further progress did not occur. It is interesting to note that the students in the Thorne and Shinedling (1970) project were unable to eliminate target behaviors, although attempts to establish behaviors were successful.

Related to this was the idiosyncratic nature of the reinforcers. Reinforcers such as though edibles were effective for many of the children. Considerable effort was expended in identifying these various reinforcers for each child. Observing the varying nature and changing strength of the reinforcers for each child was one of the most instructive aspects of the program.

As expected, many of the students showed an initial lack of confidence in their contacts with the children. This dissipated soon after additional sessions, especially as the children's emotional responses habituated to the presence of the students and the requirements of the learning task. Generally, the students found this experience to be an "important" one. Additionally, the analysis of each child's performance, as recorded in the trial by trial data sheets, provided them with an opportunity to view the step by step development of these forms of verbal behavior. In doing so, the students were able to observe and experience problems found only in actual clinical situations, thereby further developing their own competence in dealing with these types of problems.

Implications

The substantial increase in behaviorally based courses at the undergraduate level has produced a growing and relatively untapped resource. Judging from results here and those of other programs, these students are able to directly apply their basic knowledge and technical skills in behavioral psychology to areas in need of their services. The application to one important area which initially requires an intensive one to one relationship between child and instructor, i.e., the development of language repertoires in severely handicapped children, has been described here. The success of this project suggests that an expanded use of this resource may ultimately contribute toward alleviating the shortage of technical personnel, especially in institutions and treatment centers serving severely handicapped children.

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