EFFECTS OF TRAINING ATTENDING BEHAVIOR PRIOR TO INSTRUCTIONAL SKILL TRAINING

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ABSTRACT

This study examined the effects of attending behavior as a prerequisite to skill training with the severely/profoundly handicapped. Three institutionalized children in a classroom setting were involved in this single-case experimental research. Utilizing precision teaching techniques, and contingent social reinforcement, a "respond to name" response component was trained and compared to two instructional skill training phases. Results failed to indicate empirical support for attending as a prerequisite, yet the study further implicates the role of attending as critical to the instructional process. Constraints of this applied research project are also presented.

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The efforts of many are evidenced in this Thesis.

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CHAPTER I

INTRODUCTION TO:

EFFECTS OF TRAINING ATTENDING BEHAVIOR

PRIOR TO INSTRUCTIONAL SKILL TRAINING

Free appropriate education for all children is a mandate of P. L. 94-142, the Education for All Handicapped Act (Federal Register, 1977). While early litigation and challenges to this legislation have involved the mandate to provide this education for all children, the issue of "appropriate" is beginning to be examined more closely by advocates for the severely/profoundly handicapped. This is evidenced most recently by Larue vs. County School Board of Fairfax, Virginia, 1981 (Education of the Handicapped, Vol. 7 #2, 1981); Armstrong vs. Cline, 1981 (Education of the Handicapped, Vol. 7 #2, 1981); and Rowley vs. Henrick Hudson Central School District, 1980, (Education of the Handicapped, Vol. 7 #2, 1980).

Relative to this population, today's knowledge and technology in learning offers precise, systematic teaching as the most effective procedure for enacting individual growth and developmental change (Snell, 1978; Williams, Brown, & Certo, 1975; Kent, 1974; Fredericks, Baldwin, Grove, Riggs, Furey, Moore, Jordan, Gage, Levak, Alrick, and Wadlow, 1977). Although teachers often choose from a variety of methods available to instruct students, there exists a need for a thorough examination of methods of instruction for severely/profoundly handicapped persons who display particular behaviors that are (a) socially inappropriate, (b) incompatible with instruction, (c) dangerous to self or others, and/or (d) of a nature that precludes the student

working toward "normalization".

This research addressed a basic method of instruction for students who have continually had difficulty with instruction as a result of the above mentioned behaviors by evaluating the treatment of attending skills in the instructional process. This evaluation of treatment effectiveness was an attempt to further refine the definition of appropriate education for the severely/profoundly handicapped learner.

Rationale

Classroom teachers often spend an enormous amount of energy in randomly dealing with problem behaviors while trying to train basic skills. Informal observations during a four year period produced a basis for the contention that teachers often would simply ignore less offensive behaviors, while more offensive or disruptive behaviors typically became "the child's problem". In some instances, teachers actually managed the problem in a way that maintained the identified problem behavior. Further observations indicate teachers usually explain the poor progress of severely/profoundly handicapped students by citing the problem behaviors of those students. It would seem more appropriate that an individual's problem area be better identified so s/he can benefit from a more precisely targeted instructional program.

Few professionals in the area of education and training of the handicapped argue that attending plays an important role in learning

experiences. Haring (1968) concurs with educators and psychologists of learning that attending is essential to learning. Problems with academic tasks may be the result of difficulty with attending in the instructional environment. Others (Dayan, Harper, Molloy & Whitt, 1977; Snell, 1978; Van Etten, Arkell & Van Etten, 1980) approach the role of attending more directly. Dayan et al. (1977) in speaking of communication learning, feel that essentially no learning will occur if one's attention is not obtained first. One critical problem imposed upon teachers of the severely/profoundly handicapped is that of designing and implementing instructional programs that seize and hold the student's attention. Therefore, a necessary prerequisite in the instructional process is the development of attending skills (Van Etten et al., 1980).

Attending

As evidenced in the literature, children who do not attend well during instruction often have problems with learning academic/prevocational seat work (Kazdin, 1977; Craig & Holland, 1970; Mithaug, 1978; Foxx & Azrin, 1973; Harris & Sherman, 1973). Further problems have been cited with discrimination tasks (Maloney & Charrette, 1970; Mathaug, 1978; Koegel & Covert, 1974), training eye-contact (Foxx, 1977), teaching appropriate toy play (Koegel, Firestone, Kramme & Dunlap, 1974; Twardosz & Sajwa, 1972), communication instruction (Sailor, Guess, Baer & Rutherford, 1968), and teaching self-help skills (Evans, 1979; Barton, Guess, Garcia & Baer, 1970). The

handicapped population is frequently observed exhibiting behaviors that inhibit attending and therefore interfere with the instructional process. The fact that teachers of the severely/profoundly handicapped are constantly faced with these problems provided further incentive for this study.

In order to investigate attending and its role with instruction and learning, it was necessary to establish the various parameters of attending and examine definitions of attending. Haring (1968) defined attending as the "...behavior of 'looking at' and noticing certain features which come to be discriminative for the person, thing, or conditions being attended to" (p.1). Attending was described as being on-task or as engaging in on-task behavior by Bricker & Dennison (1978). More specifically, they saw attending or on-task behavior as any behavior or set of behaviors that had the potential to facilitate new skill acquisition or to alter existing responses.

In allowance for continuity of information in the review of current literature as well as in this research project, the reciprocal to attending, i.e., non-attending, was presumed to be just as critical to the examination of learning. This assumed that one is either attending to relevant instructional or environmental stimuli or not attending, and that these two states relate directly to the learning process. Therefore, with regard to instructional settings, the contention is offered that students are either attend-

ing appropriately during the onset of instruction, or those students are not attending. For the purposes of this research, the concept of attending encompassed those behaviors observed immediately prior to the presentation of instructional discriminative stimuli. The concept of non-attending were those behaviors which disrupt or prevent the presentation of appropriate instructional discriminative stimuli.

As a reference for this research study, the definition of attending was: When presented with a pre-determined S^D, the subject will cease participation in identified interfering behaviors in which s/he is engaged, turn in the direction of the presentor of that S^D and maintain that focus for at least 1 second, and consequently for the ensuing instructional S^D to be presented to the subject.

The role inappropriate behaviors play appears to be an important one in the instructional process. The further gathering of classifications of inappropriate behaviors should prove beneficial in considering qualified answers to the proposed question.

Research Question

The question to be addressed by this research project was: Will the students who exhibit inappropriate behaviors not conducive to attending, acquire new skills at a more rapid rate if attending behavior is taught before the presentation of basic skill instruction, as compared to being taught instructional skills concurrently with management of those inappropriate behaviors?

It appears that attending behaviors are maintained in a functional relationship within the instructional process. However, the manner in which one deals with the notion of attending with the severely/profoundly handicapped learner is still the critical question. Current literature on the subject of attending in the instructional setting provided helpful insight into this dilemma.

CHAPTER II

REVIEW OF THE LITERATURE

An establishment of the existance in the literature of the concept of attending during the instructional process will be evidenced in the following review. The review will also examine the various studies in the literature that attempt to validate the role or relationship of attending to learning as one of a positive functional nature or as one of neutral consequence.

Stereotypic Interference

Kent (1974) contended that children who exhibit stereotypic behavior such as head weaving, rocking, gazing or filtering with the hands, have created obstacles for their learning. The elimination of such behaviors that interfere with the learning process is a critical task toward facilitating learning.

Foxx & Azrin (1973) observed three students' whose appropriate work and play behavior replaced inappropriate self-stimulation as a result of an overcorrection procedure implemented in an experimental setting. The three autistic children had exhibited a high rate of self-stimulatory behavior in the form of mouthing, persistent clapping, and head-weaving.

A similar study (Mithaug, 1978) also found that as a result of treatment of self-stimulation, a 20 year old severely retarded male showed a significant increase in productive work. Interference consisted of high rate hysterical laughing and ritualistic hand and

arm movements. Previous efforts at concurrent behavior/skill training had failed. Treatment, targeted specifically on the inappropriate behaviors, utilized extinction for laughing and time-out for off-task activities.

A critical question raised in the literature was whether self-stimulation distracts one from the task or whether there is a physical limitation on responding when the same body part involved in self-stimulation is needed for task response (Klier & Harris, 1977). In an effort to address this question, Klier & Harris conducted a study with four very active autistic children who exhibited a high rate of self-stimulation behavior. The four were engaged in two discrimination learning tasks where one task would interfere with the self-stimulation behavior and the other would not. Results showed that three of the four children learned both tasks without suppression of self-stimulation. This study suggests to the contrary that self-stimulation elimination was not a necessary prerequisite to skill acquisition in these children. Given that prolonged instruction on tasks designed at each student's level usually leads to some level of skill acquisition, the question remains as to whether each student was learning at an optimal rate.

Three profoundly retarded adolescent boys were involved in an experiment by Evans (1979) to reduce hyperactivity and self-stimulation. The behaviors had previously shown resistance to treatment and resulted in interference with toilet training. The boys displayed

frequent and varying types of self-stimulation in all settings, yet the experimental setting was in the bathroom. The experimenters utilized colorful posters, music, and lights to create a more stimulating environment. The results imply that an enriched environment decreased time spent in self-stimulation and increased each student's receptiveness to training. Supporting this implication were the results of the study showing a significant decrease in toileting accidents with the increased environmental stimulation even when toilet successes were not differentially reinforced.

Autistic children were subjects of a study of self-stimulation and its effects on learning, where acquisition of discrimination behavior was trained and self-stimulation was suppressed (Koegel & Covert, 1974). Three children exhibiting high frequency self-stimulatory behaviors were taught to discriminate utilizing primary reinforcers and avoidance of "white noise" in the experimental room. The results of this study show that during self-stimulation, the children did not acquire the discrimination skills. However, successful discrimination learning was always associated with the reduction in self-stimulatory behaviors. This occurred even when aversive stimuli were not used for suppression.

In a similar study, Koegel et al. (1974) studied appropriate toy play with two autistic children who exhibited high rates of self-stimulation. During baseline periods, low levels of toy play were observed along with high levels of self-stimulation. During the

period of suppression of self-stimulation the percent of unreinforced, spontaneous toy play showed an increase. As the suppression procedure was withdrawn, all behaviors were observed to have returned to pre-suppression rates. The implications from this study are that a set of conditions has been identified under which spontaneous appropriate behavior might be increased in autistic children. This implication also supports the premise that non-attending i.e., self-stimulation, significantly interferes with learning.

On/Off Task Behavior Interference

The relationship between work attention and work production rate was examined with a moderately retarded 28 year old female (Shipp, Baker & Cuvo, 1980). The subject was described as highly distractible, lazy, and unmotivated while working on a packaging task. Using positive reinforcement for orientation to the work task, the measures showed no increase in the production rate. The authors suggested that "...programs that modify attention to task merely create the impression that people are more productive. In designing training programs for clients, we must be certain the behavior we choose to modify is one that is functionally related to performance and not merely correlated with it" (p.243). This study attempted to alleviate a task problem by increasing appropriate attending behavior. A closer look at the study indicated that the selected behavior (orientation to task) was more of an instructional nature rather than being a behavioral inadequacy that truly interfered with performance at any rate. Further, the lack

of motivation may have been the greater problem rather than poor attending.

Studying reinforcement contingencies with responses from mentally retarded children, Kazdin (1977) found that behaviors preceding a targeted response may influence the reinforcing effect on that response. Under experimental conditions, evidence showed greater increases in attentive behavior when attentive rather than inattentive behavior preceded the reinforced response. One implication from the study suggests that when implementing a program with reinforcement contingencies, reinforcement of appropriate behavior may be necessary whenever it occurs. However, the strength of the reinforcer will be increased when the behavior preceding the reinforced behavior is observed as being appropriate attending behavior.

According to Craig and Holland (1970), visual attention plays a critical role in the deaf child's classroom education in that if the deaf child does not focus on the instructor or teaching apparatus during instruction, s/he is prevented from acquiring input from the teaching source. Their study involved an experiment with young deaf children. Experimental conditions consisted of three groups of 6 to 10 year old deaf children in a residential school. During language, composition and copy-work periods of each day, inappropriate attending was observed. Attending behaviors were later reinforced for 16 sessions. Results showed very substantial increases in attending behavior, an indication of the effects of the reinforcement. In summary, the

authors inferred that the chances for learning are lessened when children frequently exhibited behavior inappropriate to the learning task.

Research conducted by Foxx (1977) examined a method for the training of eye-contact with two severely retarded children and one autistic child. The purpose was to examine overcorrection avoidance in order to gain eye-contact and attending. The study found the procedure to be effective in all three subjects and the results emphasized Foxx's contention that the development of eye-contact is a crucial step in the instruction of the retarded and autistic.

Mild Disruptive Behavior

A concern of classroom teachers and school administrators has always been the apparent incompatibility of disruptive and/or inattentive behavior within the schools. No clear understanding has been contrived as yet with regard to the relationship between attending and achievement. In an experiment to examine this relationship, Ferritor, Buckholdt, Hamblin & Smith (1972) measured work accomplished as well as attending behaviors of fourteen members from 2 third grade classrooms. Token reinforcemt was contingent upon attending to work and those who were not attending were ignored.

Results of this investigation displayed an increase in attending behaviors and a decrease in disruptive classroom behavior. However, it was observed that attending behavior increased concurrently with improved performances only when contingencies were simultaneously

placed on attending and correct work.

Harris & Sherman (1973) conducted a similar study with 50 children in two Math and English classes. Employing the guide of a "Good Behavior Game", disruptive behavior was the primary target. The results of this intervention showed a higher accuracy in school work as disruptive behavior was reduced. However, any improvement in accuracy resulted in a decrease in the rate of problems answered incorrectly. Consequently, the results did indicate a consistent relationship between performance on academics and attention study and disruptive behaviors.

Utilizing contingent token reinforcement for sitting at an activity table, Twardosz & Sajwa (1972) obtained multiple positive results in behavior. The results of the study displayed an inverse relationship as increased sitting led to increased appropriate toy play and social interaction. The 4 year old preschooler being examined previously exhibited incompatible behaviors such as persistent walking, lying around and running.

Time-out from meals (Barton et al., 1970) was described as an effective measure for a group of severely/profoundly retarded residents in the reduction of inappropriate and disruptive behaviors during meal training. As inappropriate behaviors decreased through intervention, incompatible appropriate table and eating behaviors showed steady increases. Another result of the study was the increase in the amount of time spent eating during the later stages of the experiment which was a direct result of less disruptive mealtime

behavior and neat utensil usage.

Severe Disruptive Behavior

A recurrent issue emerged within research relative to language modification and acquisition techniques. Sailor et al., (1968) recognized that the treatment of undesirable competing behaviors during experiments warranted an appraisal. They approached this dilemma in a study involving a 9 year old female whose limited verbal repertoire had been selectively terminated. Along with her selective muteness, tantruming had increased and usually occurred in order to interrupt contact with others.

During treatment phases of the experiment where speech development was being taught, tantrums were made to be functional. A tantrum would, in two phases, increase stimulus difficulty that was presented to her, and in two other phases a tantrum would decrease difficulty of stimulus presentation. As stimulus difficulty was functionally increased, the result was a decrease in tantrums. As tantrum behavior continued to decrease, it was found that far more words could be presented and reinforced. Essentially, a procedure for dealing with inappropriate behavior without the sacrifice of training time was successful in altering non-attending and task opportunities simultaneously.

Mithaug (1978) in another case study, examined a severely retarded 16 year old female's behavior during a sorting task. Inappropriate behaviors exhibited were described as severely disruptive, aggressive

and sometimes self-injurious. Numerous unsuccessful attempts were made to alter these patterns using positive reinforcement of appropriate responses and ignoring inappropriate behaviors.

A negative reinforcement procedure was initiated using thumb and finger pressure to the back of the neck, with removal contingent upon the subject's beginning work. The pressure was applied for ceasing work. Rate of sorting increased to 18 sorts per minute from a previous 1.7 sorts per minute. In the summary, it is suggested that the elimination of disruptive behaviors was a function of greater positive response to the instructional tasks on the part of the client.

Mithaug (1978) conducted two further investigations involving inappropriate attending skills. With a 16 year old male displaying persistent out-of-seat behavior, the success of teaching in-seat behavior as a necessary prerequisite to doing seat work was evident in the subject's subsequent progress over a two year period. Quality of work steadily improved as in-seat behavior increased in time to as much as 2 hours of uninterrupted task work.

In the second study, Mithaug examined the treatment of inappropriate vocalizations of a 14 year old female. Persistent inappropriate behavior created severe disruptions in learning simple tasks. By increasing task progress with primary reinforcement contingencies, an inverse relationship between task response and decreased vocalizations was evident.

Summary

Of these eighteen studies the results in sixteen support a definite functional relationship between attending behaviors and instruction (see Appendix A). These sixteen studies also illustrated the significance in student performance when appropriate attending behavior was attained. The relationship of attending to learning is evidenced in this review. Its place as a prerequisite to instruction has often been referenced in the review as well.

Although the literature strongly supports a positive functional relationship between attending and skill acquisition, experientially it is seldom observed to be a clearly identified prerequisite to learning in classrooms for the severely/profoundly handicapped. The purpose of this research was to investigate the notion of prerequisite behavior for instruction by the examination of three students who exhibit inappropriate attending behaviors during instruction.

CHAPTER III

METHODOLOGY

Current literature suggests that attending skills are prerequisite for learning to occur with the severely/profoundly handicapped student. This investigation addressed the manner in which attending skills are taught, with the intent of demonstrating the conditions under which skill acquisition will occur more rapidly.

The research objective was addressed utilizing a single-subject research experimental design (Hersen & Barlow, 1976). Unlike conventional research where group comparisons are commonplace, single-subject designs concentrate on the individual. Any generality of findings comes through systematic replication of individual cases, which is the strength behind single-case experimental research. As evidenced through the review of current literature, this type of research can be executed by examining one individual or a small group.

The following will present an explanation of general procedures, subject descriptions, and the selected experimental design.

Subject Description

Subjects for this research were three severely/profoundly handicapped students being served in a classroom setting at Western Carolina Center, a regional institution for the handicapped in Morganton, North Carolina. The students were 9, 11, and 13 years old. Considerations for selection included (a) a current IEP (Individualized Education Plan), (b) no physical impairment that would inhibit free response, i.e. touching, inserting, etc., (c) non-restrictive visual acuity, (d) the existence of behavioral interference that was easily identifiable.

A characterization of each subject is presented to assist in replication across similar single-subject studies. The order of presentation bears no significance.

Subject #1

Subject number one (S^1) was an 11 year 4 month old male, whose functioning level was estimated on a Vineland Social Maturity Scale at 1.4 years. Further traits of functioning estimates were: expressively, non-verbal; receptively, responds to three to four simple commands; physically, he exhibited left hemiplegic involvement yet had use of both hands/arms, he scooted on the floor as well as in and out of chairs, and was taking steps with assistance; visual and auditory acuity were untestable by conventional methods yet appeared adequate for an instructional setting; behaviorally, he exhibited general non-compliance while there were occasional observations of aggression to self and others.

Programming for this student prior to this study consisted of physical and occupational therapy training on balance and functional object manipulations, the establishment of a consistent communication method, and increasing appropriate social skills. Others were basic self-help training and the improvement of attending to task, as well as increased manipulation of task items.

For instructional purposes, this student responded inconsistently to his name during informal classroom observations. Most responses were observed rarely, and only as a cessation of activity. Major

interfering behaviors during instructional activities were, (a) failure to focus on trainer and/or activity upon request, (b) pushing away from the setting, (c) throwing toys, (d) ruminating, and (e) "cat-and-mouse" play on the way to instruction.

Subject #2

Subject number two (S^2) was a 13 year 7 month old female. Functional levels were estimated at 10.5 months on a Vineland Social Maturity Scale. She was 12 years old at the time of this testing. A further evaluation estimated her to be functioning at 7.1 months on the Bayley Scales of Infant Development. She again was 12 years old at this testing. Receptively she exhibited a few responses, most of which were paired with a generalized physical prompt, such as a touch cue to the velcro strap in her chair when asked to take her strap off. Other levels would signify her as non-verbal, non-ambulatory, having good sitting balance and hand/arm usage, and being very lethargic in movement. Visual and auditory acuity were untestable yet she appeared to respond adequately with both sensory channels. Behaviorally, activities such as gazing, hand play, and inconsistent toy play were evidenced. Whenever presented with a new toy, she most often would move it to one side and release it.

Programming for S^2 prior to this research was basically centered on self-care and physical and occupational therapy items. Outside of therapy items, object manipulation tasks and attending training were considered instructional items. Previous classroom placement con-

siderations were on self-initiated toy play and increased self-help skills.

Although characterized by lethargic, unresponsive movement and interaction, it was also considered that the lack of responsiveness during an instructional situation was a true hindrance to further development. Other observable actions during instruction were pushing items away, dropping work items to floor, cooing sounds, and slumping forward and back.

Subject #3

Subject number three (S^3) was a 9 year 4 month old female who, on the Bayley Scales of Infant Development, functioned at an estimated 7 to 8 months. Age at the time of testing was 8.10 years. Other relative functioning traits were: expressively, she was non-verbal; receptively, she followed very few requests; motorically, she very awkwardly would roll and/or scoot to desired objects (usually familiar persons). She often exhibited uncoordinated hand/arm movement; visual and auditory acuity were identified to be within normal ranges and were considered definite strengths. Behaviorally, S^3 exhibited an awareness of adult figures, laughing and playfulness, and responsiveness to the termination of work situations. Other notations were of a mouthing schema, high distractibility, non-compliant behavior and a resistance to setting change.

Ongoing programming for S^3 was also on basic skills development in self-help and motor areas. Additional training emphasized appropriate social interaction, attending to and manipulation of toys and/

or objects, and language stimulation.

In an instructional setting, this student exhibited avoidance behavior, which was generally characteristic of her in a demand situation. Slumping, thumb sucking, whining, toy pushing, and legs-on-desk were a few behaviors of many that were observed. Each was later considered as S^3's attempts to further manipulate the setting to avoid instructional demands. Another characteristic in the instructional setting was failure to respond when her name was called (although observed in a play setting).

Selection Rationale

Prior to the introduction of experimental conditions, observations were conducted of the students in instructional situations. Further discussions with classroom staff provided the necessary information to decide on the selection of a response to one's name as the targeted behavior to modify. The rationale being that each student failed when his/her name was called to cease participation in his/her ongoing activity and turn toward the direction of instructional stimuli. These two behaviors make up a response component amiable to shaping as an isolated response to the antecedent, the calling of one's name. Continued discussions and IEP provisions led to the selection of an "identifying by touch" response for training. Each student exhibited all of the necessary prerequisites for the needed training.

Response Definition

The instructional and behavioral skills to be trained were the

same for each student, since the functioning levels were similar, as were their behavioral repertoires. The instructional response to be trained was: When presented with "subject's name, touch toy", the subject would touch the toy with his/her hand. For behavior training, the subject would, when presented with his/her name, cease the activity in which engaged and turn in the direction of the trainer. It was only necessary that the subject turn and face the trainer, and not that s/he establish eye-contact. The underlying purpose in this was to have the subject locate the direction from which verbal stimuli, physical stimuli, and reinforcement systems would be coming.

Teaching Technique

Both instructional activities and behavioral training were taught using a precise "discriminative stimulus (S^D)---response---reinforcement/correction" model. During instruction, the model for each student was as follows: Present the toy to the subject, call the subject's name, wait 1 second and say "touch toy." Social praise and other reinforcement in the form of patting, rubbing, verbalizations, and quick hand play would follow a correct response of touching the toy. The time allowed for responding correctly for the receipt of contingent reinforcement was 2 seconds. The 2 second response time was maintained for the duration of the treatment phases B^1 and B^2. In the event of an incorrect response (no response) the subject's name would be repeated, with the direction "touch toy" following, as the trainer physically put the subject through the appropriate response.

Reinforcement strategies would be delivered at this time, but of a much lesser intensity.

When condition "C" (behavior training) of the experimental design was instituted all toys and the desk were eliminated. A lighted plastic fish was positioned, by way of a suspension device on the back of the trainer's chair, just behind the trainer's head as he sat in the chair for training. The subject was positioned in his/her chair just to the side of the trainer's chair so that head turning response could be easily identified, as well as be grossly shaped, i.e., a movement large enough to be determined as behavior that was both observable and measurable.

The behavior training sequence consisted of the following: When the subject was observed attending to or engaged in something of interest away from the trainer, the subject's name was called. If within 2 seconds an appropriate response did not occur, a correction procedure was initiated. The correction was a repeating of the subject's name and a simultaneous turning of the head in the direction of the trainer with the trainer's free hand. The other hand would turn on the lighted fish for approximately 2 seconds as a signal of an appropriate response. Contingent social praise and quick playfulness would be paired with appropriate and inappropriate responses in the same manner in the instructional sequence described above.

Setting and Routine

The experimental setting was a space, approximately 4' X 8'

in a bedroom adjacent to the ward's classroom. A child's-size desk was used for the presentation of instructional materials. Materials consisted of toys from the classroom, data collection material, and a lighted plastic fish with a rolling switch. The fish was used during the behavior training phase as a response signal to be switched on and off upon occurrence of the appropriate attending behavior being trained.

Training sessions were conducted in 15 minute time segments daily. The accomplishment of all phases of this research training was through the direct involvement of this experimenter, with the only exception being the use of trained independent observers for the collection of reliability data. Instructional probes were conducted daily after all behavior training sessions were completed. Prior to each experimental session, three minutes were used for talking and relaxing each subject in the classroom. In addition, consistent "work cues" were provided the student preceding and at the termination of each daily session. The purpose was to assist in receptive language development. S^1 was allowed to scoot to the setting while S^2 and S^3 were carried.

Procedures

Baseline

Baseline assessment monitored performance on the selected skills with frequency of correct responses recorded during daily instructional sessions. Responses were recorded in terms of a plus (+) and a minus (-) for respective correct and incorrect responding behavior. Pro-

cedurally, each baseline trial would consist of recording two observances. The first record would be of the subject turning or not turning when his/her name was called. Subsequently, a response of touching or not touching the toy when requested would be recorded.

Reliability

Reliability data were randomly collected by staff persons on the ward, using identical recording techniques and materials. Data were collected during the baseline period (A), treatment periods B^1 and B^2, and treatment period (C). Percentage reliability was calculated on the basis of the number of occurrences of a particular behavior during an observation. The number of agreements divided by the sum of the agreements and disagreements, multiplied by 100 was the formula used.

Experimental Design

A multi-element A-B-C-B experimental design was utilized for this research (Hersen & Barlow, 1976). This design allowed for a true baseline recording on the multiple behaviors being monitored in condition A, and the introduction and withdrawal of treatment in conditions B and C. Conditions B^1 and B^2 are replicated with regard to treatment.

The A-B-A withdrawal design, of which this A-B-C-B is a variation, is often scrutinized for returning to pre-treatment behavioral conditions for ethical and/or moral reasons. In this research study, this was not the case. Treatment of attending behavior to criterion would allow for generalization of appropriate attending behavior within the classroom. Presumably, it would then be differentially maintained by

increased reinforcement opportunities in further skill acquisition training and/or by increased spontaneous social interaction.

For the purpose of this study, Condition A monitored each subject's percentage of correct responses on a selected skill simultaneously with each subject's frequency of inappropriate attending behaviors. This phase was instituted without reinforcement contingencies for task or behavioral responding. Its purpose was to evaluate and control for increased correct responding to a favorite toy, change of setting, or the trainer.

Conditions B^1 and B^2 involved the systematic training of the selected instructional skill for each subject. Simultaneous with each skill training response was the recording of the subject's response to his/her name (appropriate attending behavior). Conditions B^1 and B^2 (skill training) continued for five days per treatment condition, with at least two sessions conducted each day.

During Condition C (behavior training) systematic training of appropriate attending behavior was conducted daily. Correct and incorrect responses were recorded, with a percentage of incorrect responses being of graphic concern. This treatment condition was to continue until inappropriate attending, i.e., not responding to one's name, was modified to a frequency of at lease 40 percent for a training session, for at least two consecutive training sessions.

Probes of instructional skill maintenance were conducted daily during Condition C. Probes consisted of one training session utili-

zing those strategies outlined in Condition B^1, including the absence of contingent reinforcement for task responding.

CHAPTER IV

ANALYSIS OF DATA

The purpose of this investigation was to analyze the effects of teaching appropriate attending behavior prior to the presentation of basic skills training with the severely/profoundly handicapped. As current literature has suggested, the role of attending behavior in the instructional process is a critical one. Systematic procedures for the training of this group of subjects were implemented in order to approach viable and replicable results.

This chapter will present the data gathered during the twenty-five days of actual training. The selected format for presenting the data is a by-subject segmentation.

Results

An A-B-C-B experimental design was utilized for this research. Each subject's individual case will be presented relative to the conditional phases in this design.

Subject #1

Baseline phase A was conducted over a three day period. Opportunities for responding to skill instruction yielded no appropriate responses. During this same recording period, inappropriate attending (as defined by not responding to name) was recorded at 100, 97, and 100 percent for the each respective day (See Figure 1.). Reliability data were calculated at 100 percent agreement for the baseline period.

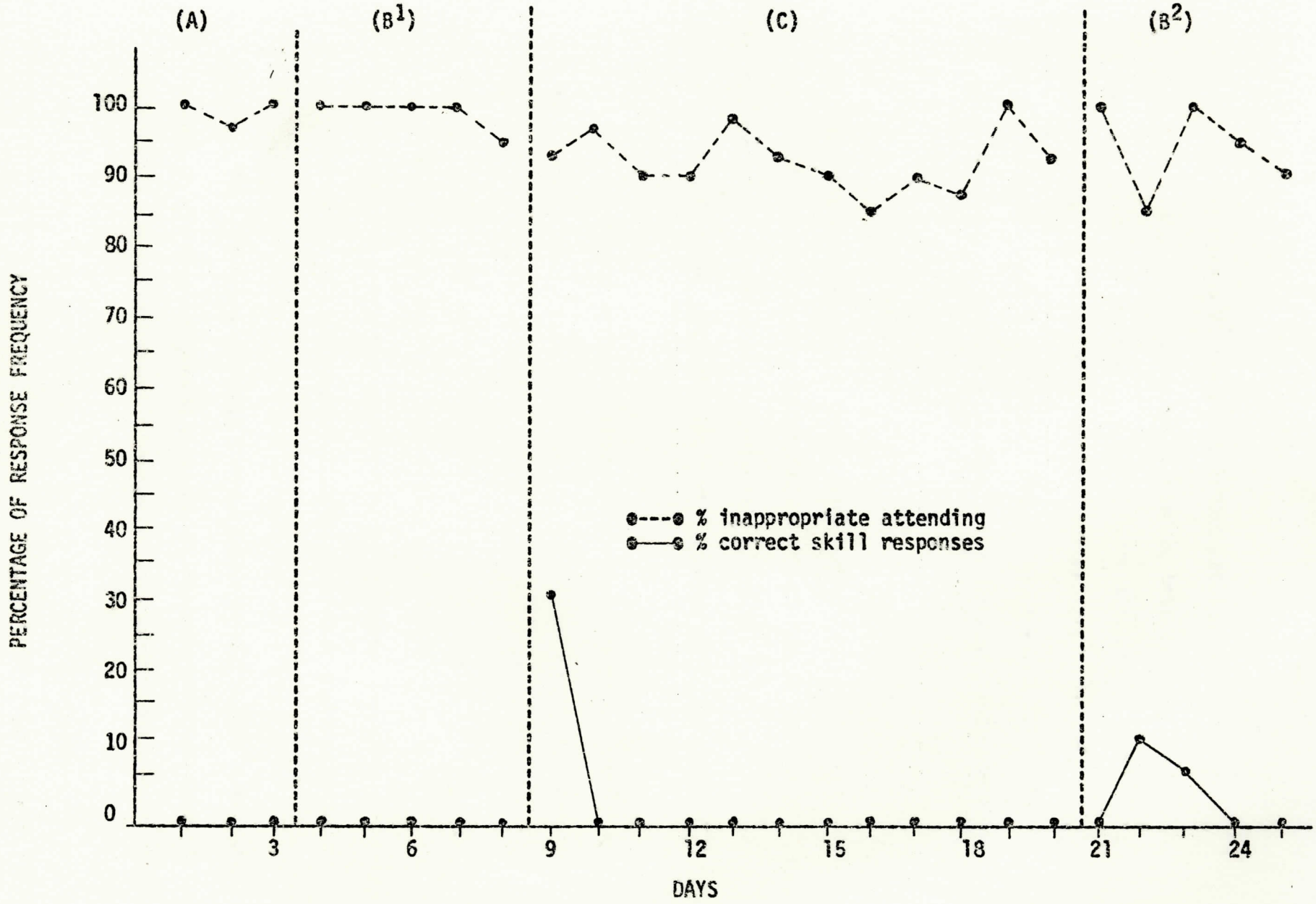

Figure 1. Record of Subject 1's responses to baseline (A), skill training (B^1), behavior training (C), and a return to skill training (B^2).

Treatment phase B^1 (skill training) was conducted for five consecutive days. S^1 failed to respond to instruction during all sessions for skill training. Inappropriate attending was also maintained at 100 percent for the first four days. Day five showed a decrease in inappropriate attending to 95 percent. Calculated reliability was 90 percent agreement for instruction and attending responses.

The introduction of behavior training occurred in Condition C, as skill training was withdrawn. Phase C was implemented for twelve consecutive days. During this phase, S^1 responded inconsistently to treatment. Percentage of inappropriate attending ranged from a low of 85 to a high of 100, with the mean inappropriate responding at 92 percent.

Probes conducted during phase C showed S^1 to respond at 30 percent correct touching on cue on day one. No further correct responding to skill probes was observed until day seven and eight, each at 10 percent, as were days ten, eleven and twelve. Day nine observed no appropriate responses during probes. Reliability for phase C was 100 percent agreement for responses across behavior training probe data.

The return to skill training (B^2) occurred on day twenty-one of the experiment. Attending behavior was monitored again through this phase. The first day of phase C showed no response to skill training or attending. Day two showed response to instruction at 10 percent and inappropriate attending at 85 percent. The final three days showed

a decrease in skill responding to 5 percent, zero, and zero respectively. Attending responses were observed at 100, 95, and 90 percent inappropriate for these same three days. A 100 percent reliability agreement was calculated for phase C responses also.

Subject #II

Experimental phase A (baseline) spanned three days for S^2. Of the instructional skill opportunities, she responded at 10 percent correct on day one and three of the baseline, and at 7 percent on the second day. Incorrect attending to name was observed in all trials as the percentage recorded equaled 100 percent reliable for all three days (See Figure 2.). Observer agreement was computed at 100 percent reliable for all responses.

Treatment B^1 for this subject was only four days due to an illness. On days one, two, and three of this phase, no correct responses were recorded for skill training. Day four shows a 5 percent increase over previous days. Corresponding attending behavior over the four days was observed at 100 percent inappropriate (no response to name) for all trials. Reliability data recorded showed 100 percent agreement for the period.

On day nine of the study, Condition C (behavior training) was implemented. Condition C was conducted for twelve days as attending behavior was trained and skill probes were conducted. Behavior training showed a range of 100 percent to 68 percent incorrect responding to her name. Mean inappropriate attending was measured at 87 percent. Only day six shows total inappropriate attending. As seen in Figure 2,

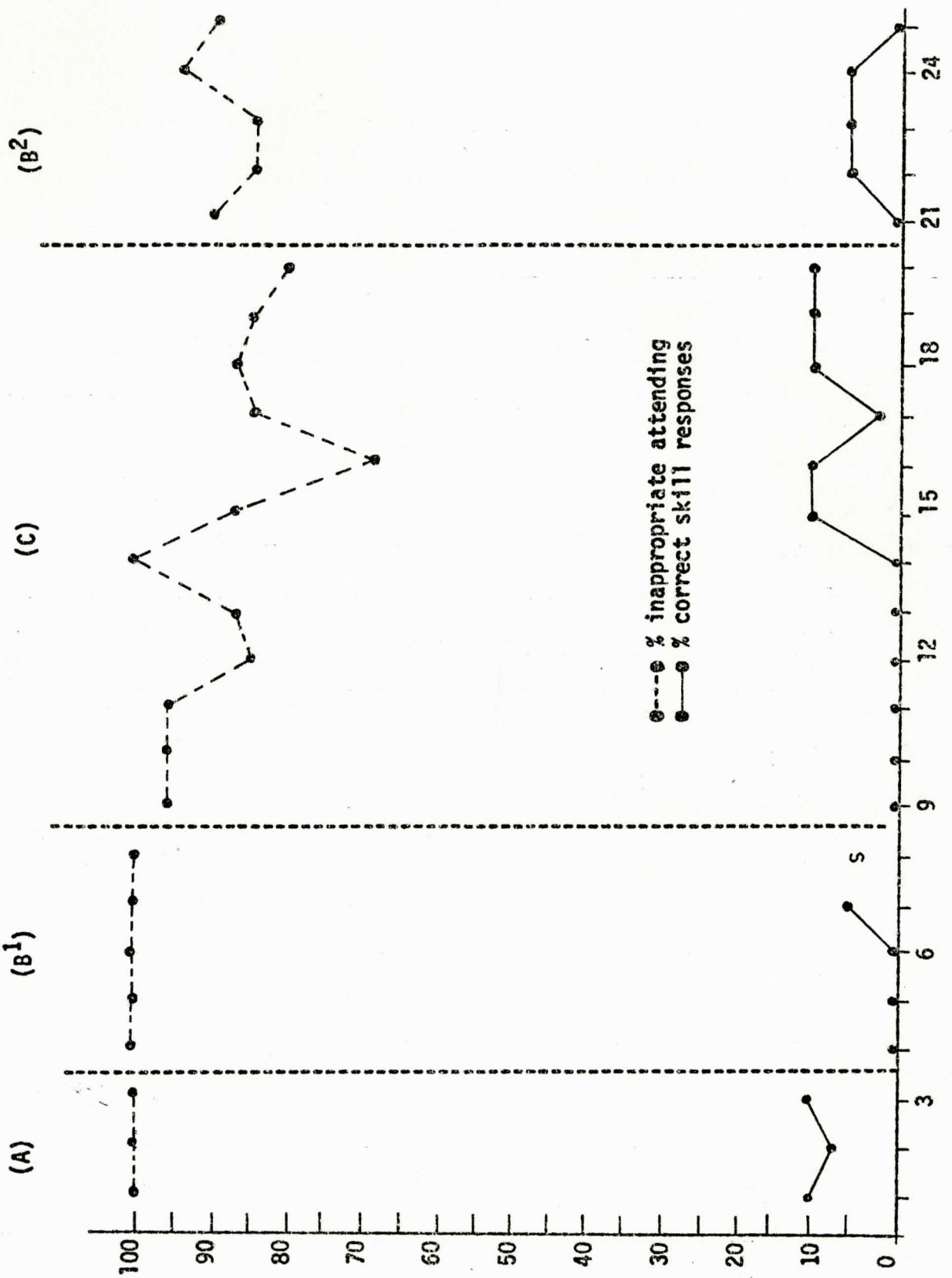

Figure 2. Record of Subject 2's responses to baseline (A), skill training (B^1), behavior training (C), and a return to skill training (B^2).

day seven and eight indicate the sharpest decline in inappropriate attending, where respective percentages of 87 and 68 are recorded. Concurrent skill probes in this phase showed the first six days with zero response to touching the toy, as did day nine. Day seven, eight, ten, eleven, and twelve all indicate a 10 percent correct response observation. Observer reliability agreement was calculated to be 95 percent for this phase of the experiment.

Treatment phase B^2 indicates the return to skill training on days twenty-one through twenty-five. On the first and last days of this phase, no correct responses to skill training were observed. The remaining three days each showed 5 percent correct responding for all trials. Attending behavior was continually monitored also. Again, identical percentages were recorded on days one and five of 90 percent incorrect attending behavior. Day two and three of this phase each indicate 85 percent inappropriate attending to name. Day four shows the highest percentage for this phase at 95 percent. Reliability agreement was 90 percent for this phase.

Subject #III

During baseline S^3 responded to instruction at 5 percent for day one and two, with day three at zero responses to touching the toy on cue (See Figure 3). Inappropriate attending to name occurred at rates of 100 percent for days one and three. Day two showed a decrease to 95 percent non-attending behavior. Percentage reliability was calculated at 90 percent.

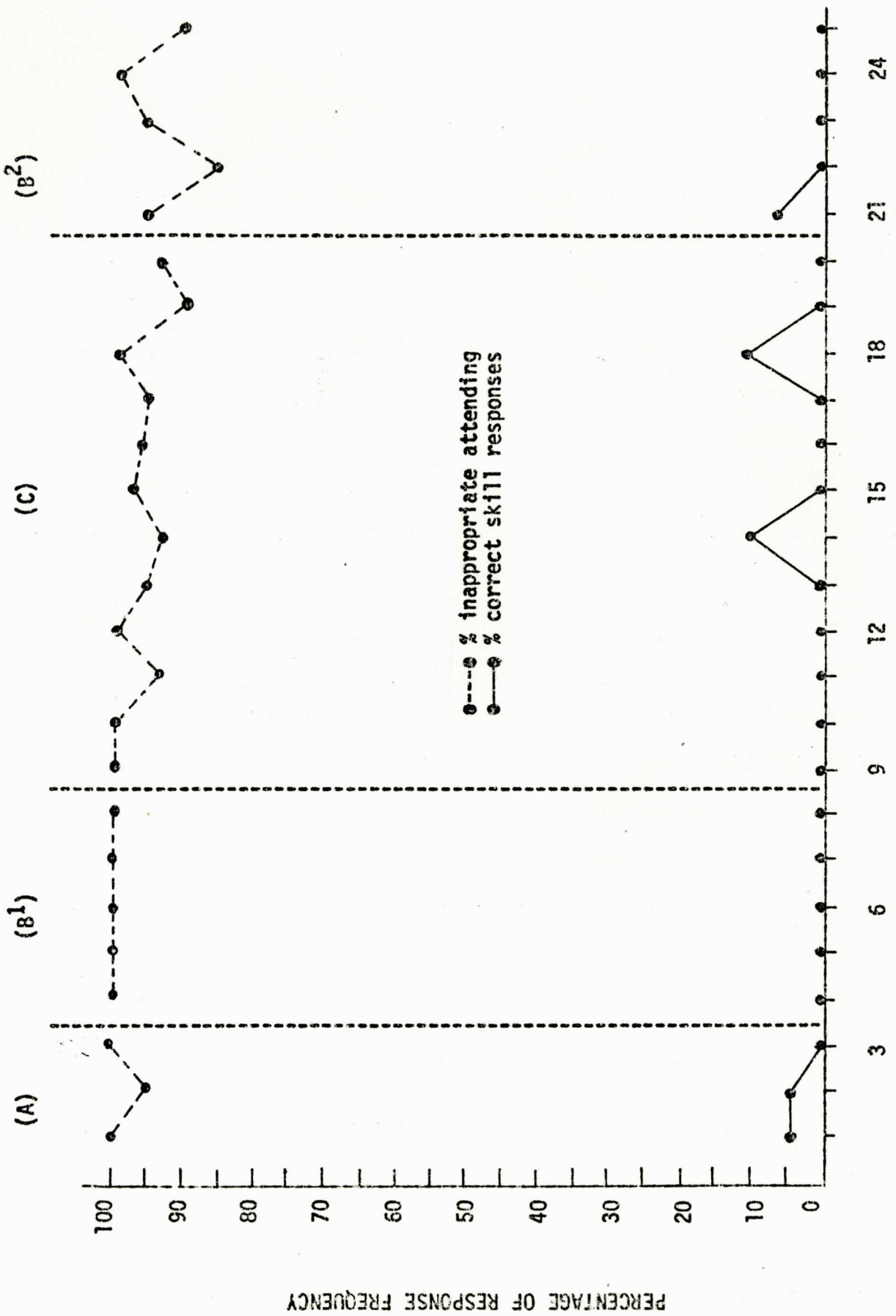

Figure 3. Record of Subject 3's responses to baseline (A), skill training (B^1), behavior training (C), and a return to skill training (B^2).

Phase B^1 of the experiment presented no responses to skill training over five days. Inappropriate attending (response to name) was observed at 100 percent for each day as well. Reliability percentages for this phase equaled 100 percent agreement.

Treatment of attending behavior for S^3 covered twelve consecutive days. Inappropriate attending behavior was recorded with a mean percent of 96 and a range from 93 to 100 percent. Four days during behavior training show no appropriate responses. Skill probes were conducted during this phase as well. During the twelve days, only days six and ten show responses to skill probes with each recorded at 10 percent correct responses. Reliability was calculated at 95 percent observer agreement.

Condition B^2, return to skill training, was instituted on day twenty-one, and lasted through day twenty-five. Skill responses were at 5 percent correct for the first day of this phase and returned to zero correct for the remaining four days. The monitoring of inappropriate attending behavior showed S^3 to respond at 95 percent on day one and three. She responded at 85 percent on day two, the least amount of inappropriate attending for her in the study. The final two days show responses at 100 percent and 90 percent incorrect. Reliability was observed to be 100 percent agreement for Condition B^2.

CHAPTER V

DISCUSSION AND SUMMARY

The purpose of this research was to examine the effects of training appropriate attending behavior prior to the presentation of instructional skills training. Three severely/profoundly handicapped students were selected as participants for this study based on their problems during instruction. Their difficulty was observed to be inherent in a lack of appropriate attending behaviors, or as it were, other behavior observed to interfere with skill instruction.

A single-subject experimental research design was utilized in this study. The design, an A-B-C-B, examined attending and skill instruction through a baseline period (A), two skill training phases B^1 and B^2, and a behavior training phase (C) which included concurrent skill probes.

The results of intervention over a twenty-five day period were presented in Chapter IV. This chapter will present a summary and discussion of those results. In addition, recommendations for further research will be offered.

Summary of Results

As was its purpose, the baseline period (A) examined the effects of introducing new toys, a new setting, or a new trainer to each subject. As evidenced there were no observed Hawthorne effects relative to the selection of toys, the training setting or the trainer. A steady baseline pattern was observed and the data help to support introducing experimental Condition B^1.

The hypothesis of this research, that behavior significantly interferes with instruction, apparently is supported graphically by those data in B^1. Each subject failed almost entirely to respond to skill instruction and contingent reinforcement during this phase. During one training session, a single correct response was recorded from one subject. Perceived problems with this and following conditions will be discussed further in this chapter.

In Condition C of this design, there were notable changes in attending behavior as each subject was being trained to respond by turning when their name was called. Informal observations and data in previous phases are evidence of a near zero response during similar situations, to several responses contingent upon reinforcement. Also evidenced in Condition C are data showing responses to daily skill training probes. There was no substantial pattern of responses for behavior training or skill training probes during this condition. However, S^2 did show several days of numerous responses. Subject one and three responded as well, yet less frequently throughout the phase.

The final phase, Condition B^2, involved a return to skill training with contingent reinforcement. Each subject responded correctly a number of times, yet no subject recorded over two correct responses for a training session. These results were identical to those in previous instructional training sessions in this project. S^1 and S^2 recorded the majority of the responses for this phase, as S^3 recorded only one correct response in five days of training.

Simultaneous recordings of inappropriate attending behaviors also occurred in Condition B^2. As the Figures 1, 2, and 3 indicate, each subject continued to respond to their name during the skill training phase, yet the effect was considered negligible.

Reliability Data Summary

Some variations in reliability were found for each phase across subjects. However, the median scores for reliability across phases were consistent and well within the acceptable range. Interobserver agreement for Subject 1 for phases A, B^1, C, and B^2 were 100, 90, 100, and 100 respectively with a mean percent of 97.5. Interobserver agreement for Subject 2 was 100, 100, 95, and 90 with a mean percent of 96.5. For Subject 3, the reliability indices were recorded at 90, 100, 95, and 100 with a mean percent at 96.5.

Discussion

As the data analysis and summary stated, no substantial support of the research question can be offered. Through the training of appropriate attending behavior these data do not show any increase in skill responding or learning quality. Underlying the emperical evidence of data are several pertinent observations gathered from this research.

Critical to applied research is the selection of experimental designs. The design utilized for this investigation was quite adequate. Its usefulness was not clearly evidenced with this study, except for the manner in which data were represented and monitored.

However, it is presumed that effective intervention systems and further training would best represent the treatment effects offered in this study by utilizing this design.

A portion of this experiment was based on precise systematic instructional techniques. Resulting from the consistent daily practice of systematic "work cues", it was observed that S^1 and S^3 responded consistently to the cues to begin travel to "work" as well as those cues that were spoken to signal termination. This was clearly evidenced with S^1, who was allowed to travel to and from "work" independently. His responses changed from initially having to be prompted fully to the training setting, to where he most often would make the round trip when asked to with minimal prompting.

S^1 and S^2 each showed evidence of interaction and responsiveness well above that of previous observations. All three subjects were informally taught behaviors more conducive to learning. Some of these behaviors were upright sitting, legs on floor, and pushing the desk away when requested only. Each of these were conditioned by daily consistency of trainer intervention and repetitious cues.

Although these behaviors were positively conditioned into an appropriate format, they were problematic as well. Many inappropriate behaviors were exhibited by the participants. By selecting the chosen response component, it was hoped that the response definition would control several of these. However, within this time frame those other behaviors exhibited created further disruption within the instructional setting. Having to control for a variety

of behaviors not conducive to the receipt of instruction or reinforcers would need either an extended time frame with the approach of this study, or possibly a re-targeting of behaviors to modify, each on a priority basis.

Another problem area with this research may be inherent in applied research of this nature. This population requires consistency and follow-up throughout each waking hour if learning is to occur optimally (Iacino & Bricker, 1978). The present research, although classroom oriented, allowed for the occurrence of the response modes as defined for a fraction of the subjects' school day. Without question, lack of daily consistency reinforced behavior other than those conducive to learning for this study.

Probably, the most critical constraint in working with this population is adequate reinforcement systems. The severely/profoundly handicapped are often a difficult group to reinforce effectively (Williams & York, 1978). Considerations such as satiation, expedience of delivery, and appropriateness often delimit the type and number of reinforcers used for teaching.

Relative to this research project, those reinforcers that were seemingly most effective with the selected participants were person-specific as well. That is, generalized social play games with the staff were reinforcing only with regard to each staff person's respective game/method. An informal survey surfaced no adequate reinforcers for these subjects. Primaries (edibles) were considered, yet rejected due to oral motor difficulties, finicky subjects, and

efficient delivery. It was noted however, that this trainer became a generalized reinforcing agent for S^1 and S^2. It was not felt that the reinforcing value was effective for instructional purposes, yet with time it potentially could have been.

Conclusions and Recommendations

This research was to examine the effects of training attending behavior prior to the presentation of basic skill instruction. The data gathered do not empirically verify the role of attending as a prerequisite to instruction. However, this research does imply that inappropriate attending behaviors do play a critical role in the delivery of instructional and reinforcement systems.

Inclusively, the method of delivery and effectiveness of reinforcers also demand considerable attention. The present study would offer substantially different data were there effective reinforcers for these subjects. As for a method of delivery, precision teaching is supported with this study, although most significant findings were through informal observations.

Future research such as this can be implemented with many of these problematic items in mind. It is hoped that through studies of this nature, methods of instruction for the severely/profoundly handicapped would draw more attention to the classroom setting and more efficient methods of service delivery within it. More importantly, valid findings relative to what skills are true prerequisites may afford this population a more accurately targeted plan of action for the compensation of remediation of handicapping conditions.

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APPENDIX

APPENDIX A

APPENDIX A

RELATIONSHIPS: BEHAVIORAL DESCRIPTORS/TASK ORIENTATION/RESULTS

Task Orientation	Behavioral Descriptors	Intervention Results	Reference
Packaging	Off-task/Attending to work	↑ Attending--Production rate	Shipp, Baker & Cuvo, 1980
Response Training	Avoidance of eye-contact	↑ Eye-contact ↑ Learning opportunities	Foxx, 1977
Discrimination Tasks	Self-stimulation	Tasks learned without suppressed self-stimulation	Klier & Harris, 1977
Academic Seat Work	Disruptive behavior	↓ Disruption ↑ Academic accuracy	Harris & Sherman, 1973
Toy Play	Self-stimulation	↓ Self-stimulation ↑ Toy play	Koegel, Firestone, Kramme & Dunlap, 1974
Academic Seat Work	Off-task/Attending to work	↑ Attending ↑ Seat work	Kazdin, 1977
Seat work/Play	Mouthing/Clapping/Head Weaving	Ø Self-stimulation ↑ Work	Foxx & Azrin, 1973
Toy Play	Out-of-seat/Disruptive behavior	↑ Sitting ↑ Toy play/ Social play	Twardosz & Sajwa, 1972

Intervention Symbol Key:

Increased (↑)
Decrease (↓)
Elimination (Ø)
Leads to (=)
Neutral Effect (--)
Did not lead to (≠)

APPENDIX A (cont.)
RELATIONSHIPS: BEHAVIORAL DESCRIPTORS/TASK ORIENTATION/RESULTS

Task Orientation	Behavioral Descriptors	Intervention Results	Reference
Seat Work	Disruptive behavior	↑ Attending ↓ Disruption ≠ correct work	Ferritor, Buckholdt, Hamblin & Smith, 1972
Seat Work	Out-of-seat behavior	↑ Sitting = Skill training	Mithaug, 1978
Sorting/Matching	Inappropriate vocalizations	↓ Vocalizations ↑ Task progress	Mithaug, 1978
Seat Work	Self-stimulation	↓ Self-stimulation ↑ Work	Mithaug, 1978
Sorting	Tantrums/Self-injurious behavior	↑ Sorting ↓ Tantrums & ↓ Self-injurious behavior	Mithaug, 1978
Toileting	Hyperactive/Self-stimulation	↑ Environmental stimulation = ↓ Accidents/Self-stimulation & Hyperactivity	Evans, 1979
Eating/Self-feeding	Finger use/Pigging/ Vocalizations	↑ Appropriate meal behavior	Barton, Guess, Garcia & Baer, 1970
Speech Development	Tantrums/Selective mute	↓ Tantrums ↑ Reinforcement opportunities	Sailor, Guess, Rutherford & Baer, 1968
Seat Work	Visual attending	↑ Attending ↑ Learning opportunities	Craig & Holland, 1970
Visual Discrimination	Self-stimulation	↓ Self-stimulation ↑ Skill training	Koegel & Covert, 1974

Intervention Symbol Key:

Increased (↑)
Elimination (Ø)
Neutral Effect (--)
Decrease (↓)
Leads to (=)
Did not lead to (≠)