A COMPARISON OF MODELING, INSTRUCTIONS AND FEEDBACK IN THE DEVELOPMENT OF THREE SOCIAL RESPONSES OF ADULT RETARDATES

by

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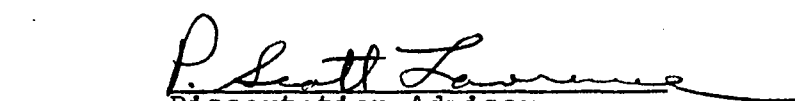
A Dissertation Submitted to
the Faculty of the Graduate School at
The University of North Carolina at Greensboro
in Partial Fulfillment
of the Requirements for the Degree
Doctor of Philosophy

Greensboro
1974

Approved by



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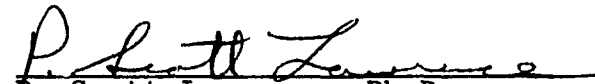
Dissertation Adviser 
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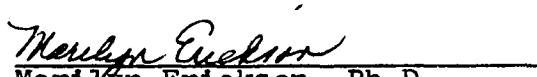
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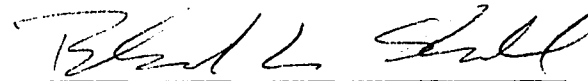
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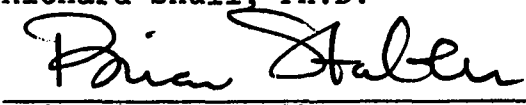
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GIBSON, FRANK WILSON, JR. A Comparison of Modeling, Instructions and Feedback in the Development of Three Social Responses of Adult Retardates. (1974)
Directed by: Dr. P. Scott Lawrence. Pp. 131.

Both modeling and feedback procedures have been found to be effective in the modification of a wide variety of behaviors. Comparisons of these procedures applied either singly or in combination have been few and the results of these studies have been inconsistent.

This investigation compared the relative efficacy of modeling and feedback procedures applied singly and in combination. Specifically, a modeling on video tape procedure and an instruction plus feedback procedure were compared. A combination procedure consisting of both modeling on video tape and instructions plus feedback was also compared to the procedures used separately. Comparisons were made of the effectiveness of these conditions in increasing the appropriate peer interaction of three retarded adults. Social interactions consisted of verbal, recreational, and cooperative responses.

A counterbalanced, multiple baseline, experimental design was utilized. This design enabled treatment comparisons to be made within each subject's performance on the three responses. The design also allowed for comparisons of collateral changes accompanying training on each of the three responses.

An evaluation of the effectiveness of each of the three training conditions revealed that each of the conditions was effective in significantly increasing each response over baseline levels. A comparison of the relative effectiveness of the three conditions found that the combination of modeling and instructions plus feedback was the strongest condition when compared with either the modeling condition or the instructions plus feedback condition applied singly.

Instructions plus feedback proved to be the second most powerful technique. Modeling was consequently found to be the weakest of the three training conditions.

Each of the three social responses was increased significantly over baseline levels. Comparisons among responses showed that recreational responding increased more than either verbal or cooperative responses. Verbalizations showed the second largest increase and were significantly greater than the frequency of cooperative responding. The interactions of trained responses with untrained responses were accounted for on the basis of the untrained responses being either trapped into or excluded from the reinforcing natural environment. Inappropriate responses were not found to significantly increase as a function of the training conditions.

ACKNOWLEDGMENTS

I wish to express my gratitude to Dr. P. Scott Lawrence, who, by serving as my dissertation chairman and doctoral program adviser made my graduate program both rewarding and challenging. To Dr. Rosemery O. Nelson, I express thanks for the terminal goals she set on my research and academic behaviors. To Drs. Marilyn Erickson, Richard Shull and Brian Stabler, I express thanks for their encouragement, support and patience as members of my doctoral committee. I would also like to thank Dr. Jacquelyn Gaebelein, of the graduate faculty, for her assistance. The treatment staff of the Henry Wiseman Kendall Center cooperated fully in the execution of this study. Finally, to my wife Norma and son Stefan, I say thanks for their total support, encouragement and patience without which I would not have reached this goal.

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CHAPTER I

INTRODUCTION

Recent research has demonstrated the effectiveness of various behavioral procedures in increasing socially desirable behaviors and decreasing socially undesirable behaviors in a variety of subject populations. Modeling processes and feedback processes have been two of the principal means for producing such behavioral alterations. Procedures which have developed from these two processes have been perceived as different both in their theoretical base as well as in their application.

The modeling process is seen by Bandura (1969) as fundamental to the acquisition and maintenance of novel behavior. He states that research within the guidelines of social learning theory "demonstrates that virtually all learning phenomena resulting from direct experiences can occur on a vicarious basis through observation of other persons' behavior and its consequences for them" (p. 118). Such exposure to modeling influences has three effects, with each being determined by separate variables (Bandura & Walters, 1963). First, an observer may learn novel response patterns which did not exist in his repertoire. Second, modeled actions and their consequences may

increase or decrease the observer's responses. Third, modeled actions often serve as discriminative stimuli for the observer and may facilitate the occurrence of responses already in his repertoire.

For any of these effects to result from the observation of a model, there are specific modeling components which influence the degree and nature of observational learning. Attention, the first modeling component, is influential in determining which modeling stimuli are observed. Variables of attention consist partly of physical stimuli in the modeling environment such as intensity, size and novelty (Miller & Dollard, 1941). Of greater importance for modeling research, however, are the specific variables of status (Lefkowitz, 1955), competence (Gelfand, 1962), and general expertise (Mausner, 1953) which act as prompts for attending behavior. The model's similarity and attractiveness to an observer may also augment attending behavior (Grusec & Mischel, 1966). Bandura (1969) states that these variables are "influential in determining which modeling stimuli will be observed and which will be ignored" (p. 136).

The second component of the modeling process is retention. Retentional skills are most strongly enhanced by covert practice or overt rehearsal of modeled response chains (Margolius & Sheffield, 1961). Bandura (1969) reports that practice with many repetitions of the modeled

responses over time also serves to identify for the observer those response elements that were not learned in earlier trials.

Motor reproduction skills make up the third component of observational learning. Rehearsal of modeled behavior for retention purposes is partially a function of an observer's ability to perform the required sequence of responses.

Incentive or motivational conditions are the final modeling component. Incentives can be arranged so that an observer receives direct reinforcement for imitating a model, or reinforcement can be programmed on a vicarious basis only. Regardless of how incentive conditions are arranged, Bandura (1965) indicates that they are the force which exerts selective control over the modeling stimuli to which a person might attend. In regard to the variables and components of the modeling process, Bandura writes:

> Observers do not function as passive video tape recorders which indiscriminately register and store all modeling stimuli encountered in everyday life. From a social learning perspective, observational learning constitutes a complex multi-process phenomenon in which absence of appropriate matching responses following exposure to modeling a stimuli may result from failures in sensory registration, inadequate transformation of modeled events to symbolic modes of representation, retention decrements, motor deficiencies, or unfavorable conditions of reinforcement (pp. 142-143).

The components and variables just reviewed are critical from a theoretical point of view to the effectiveness of the modeling process. A more detailed analysis of

modeling components is available in Bandura (1969). The next section will deal with the theoretical components of feedback processes.

The feedback process, in various procedural forms, has been developed and researched extensively. Schools, clinics and the back wards of mental institutions have been testing grounds for the principles of learning specific to these behavior change procedures.

The feedback process includes positive as well as punishing consequences. There are three components which are essential to the successful application of the feedback process. The first component, motivation, is crucial to behavior change. Theories of motivation and learning based on incentives indicate that behavior changes as a function of the consequences for that behavior. The utilization of response consequences has proven to be effective in achieving changes in selected responses in a wide variety of studies. However, other factors such as deprivation and the choice of consequences must also be considered. That is, one must select from a variety of consequences those which are durable and adequately powerful to maintain responding over extended training periods during which complex behavior chains are being established (Staats, 1965).

The second component of the feedback process concerns the arrangement of contingencies. Following the

selection of potentially effective reinforcers, the contingency between specific responses and the reinforcers must be determined. The immediacy of the reinforcer and the consistency of reinforcement are two variables which must be considered for minimal contingency management (Baer, Peterson, & Sherman, 1967). The purpose of these variables is to promote new positive forms of behavior; their misapplication can result in the development of inappropriate behavior.

The third feedback component concerns methods for eliciting responses chosen for strengthening. Powerful reinforcers and complex contingency systems are useless if the response to be strengthened does not occur. Various methods are available to counteract such behavioral deficits. The utilization of successive approximation procedures is one approach which, through incremental response steps and an initially low criterion for reinforcement, can shape complex forms of behavior previously absent from the organism's repertoire (Skinner, 1966). Another method for eliciting responses is through physical prompting. Using this method, individuals are physically assisted in making the correct response (Lovaas, 1967). The third method which can be utilized in eliciting responses previously absent from the individual's repertoire is verbal prompting or instructing. Individuals who are responsive to "social forms of response guidance" may be

instructed how and when to perform the appropriate behaviors (Baer & Wolf, 1967).

Theoretical interpretations of learning processes have focused, to a great extent, on outcomes specific to both modeling procedures and feedback procedures. In the previous discussion, the primary components of modeling and feedback were summarized. For modeling, the components were attention, retention, incentives, and motor reproduction. For feedback, the components were incentives, contingencies, and response elicitation.

Much of the research upon which the theoretical interpretations for both modeling and feedback processes are based consists of specific "component packages." That is, variables of each component have been investigated in various procedural combinations within both processes (O'Connor, 1969; Fechter, 1971; Bandura, 1968; Ayllon & Azrin, 1964; Hopkins, 1968; Altman, Talkington, & Cleland, 1972). Several investigators have attempted a comparison of such procedural combinations between the two processes of modeling and feedback (Masters & Branch, 1969; Staples, Wilson, & Walters, 1963). Only relatively recently have experimenters begun to evaluate the relative effectiveness of combinations of modeling and feedback procedures applied both singly and in combination (O'Connor, 1972).

In light of the numerous variables associated with the components of various modeling and feedback procedures, there is a need to focus attention on the research findings of such procedures examined separately and in combination.

This research review is categorized in terms of the three treatment conditions being compared in the present experiment. These conditions are: a modeling procedure presented on video tape, a feedback procedure utilizing instructions, and a combination modeling and feedback procedure utilizing instructions. The effects of these conditions on various social responses of retarded persons are additional variables which will be addressed in the following section.

Modeling

Experimental analyses of procedures which utilize modeling as the primary agent for behavior change demonstrate a close adherence to the basic components of the modeling process. The variables specific to the modeling components of attention, retention, motor reproduction, and incentive conditions have been investigated in a number of studies both with normal populations as well as with deviant ones.

Rosenthal, Zimmerman and Durning (1970) studied the effect of an adult model's use of abstract question formulation upon the question asking behavior of eleven-year-old children. The results showed an increase in the use of

interrogatives through modeling without any extrinsic incentive conditions programmed. All modeling conditions were performed within the physical presence of the observers.

Modeling procedures have also been found to be effective in the modification of interpersonal behavior. Bandura (1965) had normal nursery school children observe a filmed adult male model who exhibited novel verbal and physical aggressive responses. In one condition, the model was rewarded for such behavior; in a second, the model was punished while the third condition presented no consequences to the model. A postexposure test indicated that the response consequences to the model had differential effects on imitative behavior. That is, children in the model-punished condition emitted significantly fewer imitative responses than children in both the model-rewarded and the no-consequences groups. These differences were eliminated when children in all three groups were rewarded contingently for imitative aggressive behavior. This study demonstrated that not only can children learn from film-mediated models but also that their performance of the model's behavior can be increased in a novel environment once contingent rewards are introduced.

Of the experiments discussed, the models presented their imitative stimuli to normal populations. Current research in modeling processes with deviant populations as observers has been concentrated on behaviors compatible

with the repertoires of the population. Models used with such populations are usually similar to the observing population in regards to such physical variables as age, attractiveness, and attire (Berkowitz, 1968; Fechter, 1971; O'Connor, 1969).

Berkowitz (1968) used retarded models in a study designed to increase the imitative motor repertoires of profoundly retarded children. The models who presented the response sequences in the presence of the observers were effective in demonstrating that strong and stable imitative motor responses can be developed even in previously non-imitative, profoundly retarded children.

The utilization of models who are similar to observers with respect to physical variables has been supported strongly by Hicks (1965). Hicks also reports that using peers as models is also effective in film presentations of model behavior. In a study by Fechter (1971), the use of modeling on film was conducted with retarded subjects ranging in age from 8 to 38 years. The subjects were selected on the basis of their having a history of either aggressive or friendly behavior. Fechter found that the number of aggressive responses increased slightly for both aggressive and friendly subjects after they observed aggressive behavior on film. However, aggressive behavior decreased following the film showing friendly behavior. No extrinsic incentive conditions were

included in this investigation. Although this study had several procedural difficulties, it lends further support to the feasibility of using film for the presentation of modeling conditions to retarded persons.

Results of a study by O'Connor (1969) involving filmed modeling further supports the roles that symbolic modeling and model similarity share in the modification of social behavior. Twenty preschool children were chosen who showed extreme social withdrawal. Ten of these children were placed in a group shown a control film with no human interaction. The other ten children were shown a film of an isolate child watching positive social interaction between several children. The 11 film sequences were presented in 23 minutes. They portrayed a child initially observing the activities of the children at a distance but gradually joining in and obviously enjoying himself. A behavioral assessment following the film sequences showed the control group still withdrawn, whereas the children who received the symbolic modeling were interacting significantly over the previous baseline level.

The studies which were reviewed in this section represent only certain of the areas where modeling procedures have proven effective. However, these studies do bring to the foreground important variables of the modeling process.

Variations in the incentive component of the modeling process have also been reported. Numerous studies have used extrinsic forms of feedback or reinforcement with modeling procedures and have reported profound changes in a variety of social responses (Bandura, 1965; Berkowitz, 1968). Others have reported the success of modeling procedures with intrinsic feedback (models' interaction) utilized (Fechter, 1971; O'Connor, 1969). Therefore, there does not appear to be any pattern developing which would favor the use of extrinsic feedback to intrinsic feedback as the incentive component in modeling procedures.

In addition, the studies just reviewed indicate that modeling conditions can be presented on film with no apparent loss in the effectiveness of the procedure (Bandura, 1965; Hicks, 1965). Even populations such as institutionalized retardates have been found to respond to filmed models (Fechter, 1971; O'Connor, 1969). Filmed modeling also has a research advantage over modeling performed in the physical presence of an observer, since replication of modeling research would be more feasible if the modeling were performed on film.

Finally, social responses were seen modifiable via the various modeling procedures employed. Such responses as question-asking (Rosenthal, et al., 1970), aggression (Bandura, 1965; Fechter, 1971), and social withdrawal (O'Connor, 1969) were changed using modeling procedures.

Feedback Utilizing Instructions

The inclusion of instructional stimuli as part of the feedback process has been seen as critical by several investigators. Baer and Wolf (1967) view instructions as an important part of response elicitation, the third component of feedback processes. They indicate that complex response patterns can be elicited through the use of verbal prompts or instructions. Bandura (1968) sees instructional stimuli as critical to the proper functioning of various feedback procedures.

In spite of the importance of instructional stimuli, Steinman (1970) has suggested that of the various response elicitation variables available to the feedback process, instructional control has been least investigated. Much more emphasis has been placed on investigating the outcome of shaping and reinforcement components combined with each other. Nevertheless, several early studies investigated the effects of instructions and reinforcement components in the modification of social behavior. For example, Ayllon and Azrin (1964) found that instructions to patients diagnosed as schizophrenic were not effective in increasing appropriate social eating behavior unless those instructions were paired with reinforcement. A similar combination of component procedures was found to be effective in increasing the social greeting responses of a population of mental patients (Kale, Kaye, Whelan, & Hopkins, 1968).

The use of instructions and reinforcement in modifying the social responses of retarded populations has been investigated by Herman and Tramontana (1971), Hopkins (1968), and by Whitman, Zakaras and Chardos (1971). Herman and Tramontana found that explicit instructions in combination with reinforcement were more effective in modifying on task behavior in culturally deprived retarded children than either component taken separately.

B. L. Hopkins (1968), in two successive experiments, studied the effects of various conditions of instruction and reinforcement pairings. The first experiment involved a ten-year-old retarded male who had been observed to emit a low frequency of smiling responses. Using instructions and social reinforcement, the boy's smiling behavior increased over baseline responding. A second experiment involved an eight-year-old retarded boy with a similar deficit in smiling behavior. The procedure with this subject was simply walking with the boy and when another person was encountered, the subject was instructed to smile. Reinforcement for this behavior was not dispensed by the experimenter but rather by the person encountered. Social reinforcement was used and consisted of the person smiling and verbally responding to the boy. Next, instructions were faded out, and a candy reinforcement was used to maintain smiling behavior. Following this sequence, a reversal was programmed. This consisted of extinction

when smiling responses occurred and subsequently social interactions contingent on smiling responses. It was found that during the acquisition phase of the study that the instructional component was necessary to elicit smiling behavior. However, in the performance phase of the study, instructions could be faded as long as some reinforcement was provided. When both the instructional and reinforcement components were eliminated, smiling decreased to a near baseline level.

Whitman, Zakaras and Chardos (1970) found that neither reinforcement nor instructions alone are sufficient components for motor response acquisition. Two severely retarded children were instructed and reinforced for simple motor responses. When either component was removed during acquisition, the behavior approximated the previous baseline level.

The studies reviewed in this section account for a small percentage of the areas where feedback processes have been found effective. These studies do, though, point out the feasibility of implementing the less commonly found combination of instructions for response elicitation and reinforcement for response maintenance.

More specifically, this review attended to the research results which demonstrated the feasibility of using the instructional and reinforcement components with retarded populations. It was found that most of these

investigations utilized instructional control for fairly simple response sequences such as smiling (Hopkins, 1968), self help skills (Ayllon et al., 1964), and motor responses (Whitman et al., 1971). More important was the fact that retarded populations can and will respond to verbal forms of response elicitation. It was also reported that both instructions and reinforcement are necessary components during the acquisition phase of training (Whitman et al., 1971; Hopkins, 1968).

Modeling, Feedback and Instructions

There have been over the previous decade certain research trends which have developed as a function of the increased emphasis on the application of modeling procedures and feedback procedures. Initially, the trend was one in which procedures specific to the modeling process and the feedback process were researched separately. Recently, there has been research reported which has utilized components of the modeling process and the feedback process in combination. One of the most extensive examples of modeling and feedback procedural combinations is the speech program for autistic children conducted by Ivor Lovaas (1967). Lovaas taught the children verbal behavior through a discrimination training procedure entailing six steps. Initially, the child was reinforced for all vocalizations and for looking at the experimenter. Secondly,

the child's verbal approximation of the model's phonemic verbalization was reinforced. Next, only the child's exact verbal imitation of the model was reinforced. The last three steps followed the same basic procedure except that words and phrases were gradually introduced. Through the combination of modeling, physical prompting, and manipulations of response consequences, previously mute children were taught speech. Baer, Peterson and Sherman (1967) developed a similar program with profoundly retarded children. The success of these and other combination procedures has led investigators to research the relative efficacy of various modeling and instructions and feedback procedures applied both singly and/or in combination. The studies that follow have attempted to evaluate such efficacy with several populations and responses.

Whalen (1969) explored the effectiveness of multiple conditions of modeling on film and instructions in the modification of the verbal behavior of college students. The results indicated that when either of the procedures was used separately, there was no differential superiority of any one procedure over the others. However, a combination of the procedures showed a marked superiority over either taken separately.

Masters and Branch (1969) investigated the relative effectiveness of instructions, modeling and reinforcement procedures, taken separately, in the modification of word

associations of college students. The three procedures were evaluated on the basis of three criteria: the effectiveness of the procedure in producing immediate behavior change, the stability of the behavior change, and generalization to new stimuli. The results indicated that instructional procedures were more effective than either modeling or reinforcement procedures in effecting immediate and stable behavior change. Generalization tests, however, showed that the reinforcement procedure was more effective for transfer to unfamiliar stimuli than either modeling or instructional procedures. The fact that instructional procedures proved to be the strongest condition in relation to the first two criteria was explained on the basis of the rules given by each condition. The instruction group was given explicit rules for the experimental task while the other groups were expected to deduce the correct response set from a sample of behavior.

Bandura and Harris (1966) investigated the role of modeling cues, reinforcement and attention variables in the modification of children's syntactic style. The results showed differential responding to the various procedures. When modeling was combined with reinforcement procedures, there was a significant increase in passive construction over either procedure used separately. Whereas, with prepositional phrases, reinforcement combined with attentional set variables proved to be a significantly stronger procedure than modeling alone.

O'Connor (1972) conducted a comprehensive study on the relative efficacy of behavioral procedures. He compared the outcomes of a feedback procedure and a modeling procedure applied both singly and in combination. As in a previous study (O'Connor, 1969), he chose social isolates as the subject population. The isolates, aged 3-5 years, were selected from several nursery schools. All modeling conditions were programmed on video tape with eleven sequences running for 23 minute viewing times. The models were nursery school children demonstrating various scenes of social interaction. The feedback procedure made use of successive approximation techniques as the response elicitation component and social reinforcement as the incentive component.

There were four conditions in O'Connor's study: modeling and shaping, modeling only, shaping, and control. There were five dependent variables included to measure the effectiveness of the treatment conditions: proximity to, visual contact towards, verbal behavior with, interaction with and number of children in the group.

An immediate test following the presentation of the treatment conditions showed a significant increase in interactions for the subjects in all three experimental groups. Although the post tests yielded no differences between any of the experimental groups, significant differences were found between the groups during the

follow-up phases. Both the behavior of the modeling group and the modeling plus shaping group remained stable over a three-week period, while the group which received the shaping conditions alone exhibited a reduction of interaction responses in the follow-up phase.

In spite of the recent interest in comparing various combinations of behavioral procedures, such research is in only the initial stage of development. Nevertheless, several studies comparing various procedural combinations were reported (Whalen, 1969; Bandura et al., 1966; Masters et al., 1969; O'Connor, 1972). The evidence so far is contradictory on the benefits of various combination procedures over procedures taken singly (Masters et al., 1969; O'Connor, 1972).

Contradictory evidence was also presented as to whether some procedural combinations have differential effects on responding. Although differential effects were found in the Bandura and Harris (1966) study, no such effects were reported by O'Connor (1972).

Summary

Research utilizing modeling procedures, feedback procedures, and a combination of modeling and feedback procedures was reviewed with respect to the procedural component variables, the subject populations and the responses selected for modification.

In the review of procedures generated by the modeling process, it was found that first, both extrinsic and intrinsic forms of reinforcement were used. However, none of the studies demonstrated the success of one form over the other. Second, modeling conditions presented on film were found to be effective not only with normal populations but also with retarded ones. Third, simple social responses were found to be modifiable via the various modeling procedures employed.

In the review of procedures generated by the feedback process it was found that the use of instructions to elicit initial behavior was highly effective. The component combination of instructions and reinforcement procedurally was found to be effective in the modification of language responses, motor responses, and social responses with various populations. The use of this procedural combination was also seen to be feasible with persons who were retarded.

The last section surveyed the research where combinations of feedback and modeling procedures were implemented. The review of studies utilizing combinations of modeling, instructions and reinforcement were found to be effective in modifying the language behavior of both autistic and retarded populations.

The relative efficacy of these procedures applied both singly and in combination was also reviewed with

contradictory evidence reported. No single combination of procedures was found to be most effective in all studies. Contradictory evidence was also reported on the differential effects of these procedures on various responses.

Research Questions

The outcome of research using modeling procedures as well as research using feedback procedures has been quite favorable. Although research aimed at comparing these procedures applied both singly and in combination (Masters & Branch, 1969; O'Connor, 1972) has both theoretical and applied significance, such comparisons have been few and the results contradictory.

Probably, the single most important research question is whether or not a combination of these procedures is more effective than either taken separately. In addition, there are other variables that must be considered in investigating the use of procedural combinations such as the selection of the subject population and the response classes investigated. Past procedural comparisons have selected subjects from normal populations (Bandura, et al., 1966; Whalen, 1969; Masters et al., 1969) as opposed to retarded subjects. Since much of the initial human research on basic feedback and modeling processes utilized retarded subjects, it would seem that they are an appropriate group to use for procedural comparison studies (Fechter, 1971; Berkowitz, 1968; Lovaas, 1966; Hopkins, 1968).

There is little evidence on the differential effects that certain procedural combinations have on behavior. Bandura and Harris (1966) have noted such effects in the modification of the syntactic style of children. However, O'Connor (1969) reported no immediate differential effects of such procedures on children's isolate behavior. Therefore, a greater emphasis needs to be placed on measuring multiple responses in studies of procedural comparisons before any differential patterns will be known.

In order to collect information relevant to these research questions, the present investigation assessed the relative efficacy of two procedures applied both singly as well as in combination. More specifically, a modeling on video tape procedure and an instruction plus feedback procedure were compared. These two separate procedures were also compared to a combination of modeling and instructions plus feedback procedure.

Three social responses were trained via the three treatment conditions. The verbalization responses, recreational responses and cooperative responses of retarded adults were treated independently but observed and measured concurrently, immediately following training. Since previous studies have rarely measured multiple responses, it was not known if the treatment conditions would have differential effects on the various responses. The extent to which training on one response affects responding on alternative responses was also unknown.

CHAPTER II

METHOD

Subjects

Three persons admitted to the adult cottage at the Henry Wiseman Kendall Center, Greensboro, North Carolina, served as subjects for this investigation. Each subject had received a diagnosis of mental retardation at an early age while residing in other institutions.

Included are one male and two females with ages of twenty-seven, twenty and twenty, respectively. Their full-scale I.Q. scores were fifty-two, eighty-three, and seventy-five, respectively, as measured by the Wechsler Adult Intelligence Scale (WAIS). None of the subjects had obvious physical disabilities and medical examinations revealed no physical abnormalities. Each subject had a sufficient receptive and expressive speech repertoire to allow them to engage in casual conversation. In addition, their attention to and comprehension of behavior on television, as well as their attention to the behavior of their peers and the cottage staff was judged sufficient for the subjects' participation in a modeling study. All the subjects included in the study exhibited deficiencies in the area of social skills, especially in peer interactions. Each subject had a long history of custodial

institutional care prior to being admitted to Kendall Center. Their lack of appropriate peer social behavior was verbally supported by intake information supplied by their previous institutions.

Subject D. A., a twenty-year-old Caucasian woman, had been admitted to Murdoch Center, North Carolina, in 1962. Her mother had deserted her and two other siblings in 1954. At that point, the father was imprisoned and Social Services took custody. Prior to entering Murdoch Center the subject had several unsuccessful placements in foster homes. While at Murdoch, her work assignments consisted mostly of kitchen duties. It was reported that she performed her work well after training and cooperated with the kitchen staff. However, when on the ward, there was reported to be little social interaction with her peers.

Treatment goals at Kendall Center for this subject were to improve her appropriate independent work behavior, as well as to establish positive social interaction.

Testing on the Wechsler Adult Intelligence Scale revealed a full-scale score of 83; a verbal I.Q. score of 76; and a performance I.Q. score of 95. This testing was completed just prior to the subject's entry into Kendall Center.

Subject J. H. is a twenty-year-old Caucasian woman with a six-year history of institutionalization. After her

mother died and her father was jailed, she was admitted to Murdoch Center in 1967. She worked in the cafeteria at Murdoch with no problems associated with this placement. She applied for admittance to a local halfway house but was rejected. It was decided that placement in Kendall Center for short-term treatment of her withdrawn behavior might facilitate a future community placement.

Results of the Wechsler Adult Intelligence Scale give this subject a full-scale I.Q. score of 75; a verbal I.Q. score of 75; and a performance I.Q. score of 78. Testing was completed as part of the assessment for admittance to Kendall Center.

Subject B. T. is a twenty-seven-year-old Caucasian male who had been placed in the Ralph Scott Group Home in Burlington, North Carolina, prior to entering Kendall Center. He has a long history of institutionalization, having been admitted to Caswell Training School in 1956, and Murdoch Center in 1961. He had deficits in on task job behavior and appropriate social interaction. Temper tantrums and crying to avoid going to work were behaviors reported as occurring frequently, and these are now the focus of this subject's treatment program. Additional treatment goals were to increase appropriate social interaction both in a work situation and in cottage life.

He was given the Wechsler Adult Intelligence Scale, and the results are a full-scale I.Q. score of 52,

a performance I.Q. score of 47 and a verbal I.Q. score of 66.

Experimental Design

This study utilized a multiple baseline design with three treatment conditions and three target responses. The presentation of all treatment conditions was counterbalanced for training of responses both at the intra-subject level and the inter-subject level. The presentation of responses was also counterbalanced between subjects.

Following a baseline period, each subject received the three treatment conditions specific to each of the three target responses. The treatment conditions were as follows:

Baseline--Responses 1 (Verbalization), 2 (Recreation), 3 (Cooperation)

Treatment--

A Modeling on video tape

Probe

B Instructions and Feedback

Probe

C Modeling-video, Instructions and Feedback

Probe

The above treatments were the same for each of the responses and subjects except for the fact that they were counterbalanced to control for possible order effects. The order of presentation of response conditions and

treatment conditions for each subject is presented in Table 1.

TABLE 1

Order of Presentation of Response Conditions and Treatment Conditions

Subject	Responses	Treatment Order
D. A.	1	ABC
	2	BCA
	3	CAB
J. H.	3	BCA
	1	CAB
	2	ABC
B. T.	2	CAB
	3	ABC
	1	BCA

Responses

Each of the three response classes selected were derived empirically by an analysis of responses assessed daily through the token program operative in the subjects' cottage. The subjects, through the token program, had the opportunity to earn signatures, recorded on a card carried by them, for a variety of different activities. These signatures were cashed in for back-up reinforcers in

the canteen, such as candy, popcorn, toilet articles, or drinks, or they could be cashed in for special events such as movies, television rental, staying up late, or off-campus events.

The responses for which they were reinforced included such self-help behaviors as bathing, shaving and brushing teeth; work behaviors, such as bed-making, washing dishes, mopping, and vacuuming.

They could also receive signatures for being "friendly" at the cottage; that is, signatures were given to a subject for appropriate social interaction such as talking with a peer or cottage parent, playing a game with a peer or cottage parent, or helping a peer or cottage parent to perform some task.

Since there was an equal opportunity to earn signatures in the three general areas of self-help, social interaction, and work at the Center, one third of each subject's signatures could have been earned in each of the three general response areas. An analysis of the cumulative total of signatures given to each subject over a seven-day period showed that from 90 to 95% of all signatures earned were for individual work or self-help related activities. Only 5-10% of the signatures earned were for appropriate social interaction with peers.

After this preliminary assessment on the basis of signatures earned, the following responses were

chosen as important social behaviors in their cottage life.

These five categories were recorded using a time sampling procedure.

Response 1--Non-specific verbal interaction responses

Subjects engaged in this response class could be either sitting or standing. They had to be within a proximity of six feet of one or more peers and had to emit direct verbalizations to that peer. Verbalizations were of a general information nature. Responses included were greeting responses, verbalizations about the Center, a job, the weather, home visits, the staff, the residents, music, the food, etc.

Response 2--Activity specific interaction responses

Subjects engaged in this response class could be either sitting or standing. They had to be within a proximity of twelve feet of their peers. Responses, either verbal or motor, had to be activity specific and peer directed. The activities included were of a recreational nature only, such as playing games, cards, checkers, pool, listening to records or playing with puzzles.

Response 3--Cooperation specific interaction responses

Subjects engaged in this response class could be either sitting or standing. Responses here, both verbal and motor, were of a cooperative or helping nature. Such responses could be cooperating in getting the food trays,

in washing dishes, sweeping and mopping the floors, setting the table and washing clothes.

Response 4--Inappropriate verbal interaction responses

Subjects engaged in this response class could be either sitting or standing. They had to direct verbalizations to their peer or peers. Responses here were of an uncooperative or antisocial nature. Such responses could be yelling at a peer, telling a peer to get out of his way, telling a peer to leave him alone, physical aggression, telling a peer that he didn't like him or her.

Response 5--Absence of social interaction

Subjects engaged in this response class could be either sitting or standing. They could not direct any verbalizations to any peer.

Observers

Four naive undergraduate psychology students served as observers. They were instructed in using specific conventions for observing and recording social interaction using the response coding system prior to the initiation of the study. The conventions included the following:

1. Any number of the five response categories could be coded in any one interval.
2. The onset and termination of any response category could be noted by the absence of the coded response in the preceding interval.
3. Responses were to be indicated on labeled and coded

data sheets. (A sample data sheet is provided in Appendix A.)

4. Observations were to be recorded continuously for fifteen-second intervals totaling five minutes. There were to be six five-minute periods per session. Each five-minute observation session was to be followed by a one-minute rest period before the next five-minute session began.

Reliability

To determine the reliability coefficients of each response category, video tapes of peer interactions including the three subjects were coded by four independent observers and the experimenter. Reliability coefficients, expressed as a percentage of agreement between the experimenter and the four independent observers were obtained over twelve practice sessions prior to the collection of baseline data. Percentage of agreement was defined as number of agreements divided by the number of disagreements plus the number of agreements multiplied by 100. Reliability measures were also taken for each subject during each of the baseline sessions and in each of the probe sessions by the observers.

Procedures

Baseline Periods

The first condition consisted of baseline observations. All baseline observations were completed in the

living room of the cottage where the subjects lived. Observations were made during periods of time when the majority of the cottage residents were present. In addition, time periods were selected on the basis of the subjects having the opportunity to engage in all of the target response classes. These times were the late afternoon and the evening hours when the subjects all remained in the living area.

TABLE 2

Inter-Rater Reliability Coefficients for the Twelve Practice Sessions

Session	Observer 1	Observer 2	Observer 3	Observer 4
	%	%	%	%
1	78	86	93	90
2	96	90	96	94
3	92	88	92	88
4	96	94	86	94
5	88	84	81	92
6	93	92	100	88
7	94	91	92	92
8	91	88	100	97
9	86	96	92	91
10	93	90	90	89
11	90	92	88	93
12	100	93	94	90
$\bar{X}$	91.4	90.3	92.0	91.5

Two observers were placed in inconspicuous areas within the cottage living area. Their presence would not normally be questioned, due to the fact that visitors

and other observers frequently entered and remained unattended in the cottage for extended periods of time.

Each observer coded each baseline session for one subject at a time using the five response classes. Each five-minute observation session consisted of fifteen continuous twenty-second intervals. Every five-minute observation session was followed by a one-minute rest period. The baseline period consisted of twenty-four observation sessions per subject, taken over several days.

During the baseline period and other observation sessions, the subjects were not instructed as to the purpose of the observers. This was due partially to the fact that observers had visited the cottage area on previous occasions, and their presence had not elicited inquisitive behavior directed to the observers. Also, the cottage life staff was not informed as to the purpose of the observers. They too were accustomed to persons not on staff being in the building on a regular basis. There were no prompts or instructions given to the subjects by the staff, the experimenter or the observers at any time in the living quarters.

Probe and Treatment Periods

Probe observations were conducted at the termination of each of the treatment conditions. The experimenter administered each treatment condition in a separate area

near the living room, where the subjects spent the majority of their time outside of their rooms.

At the termination of every treatment condition, the subject received the following prompt from the experimenter: "(Name), I would like you to practice what you have learned here today. You can go back into the living room now. Thank you for your time."

When the subject entered the living area, the observers were positioned as they had been in the baseline condition. Upon the subject's entry, the thirty-minute probe period began as in the baseline period. There was a probe conducted for each of the three responses after treatment by each of the three treatment conditions.

On the day following each training condition, a return to baseline probe was conducted with the purpose of assessing the long term effect of the previous day's training. Since no reinforcement was programmed to maintain a high rate of responding, the post training response rate was expected to decrease gradually until the baseline rate was reached. Consistent with the multiple baseline design, training could not continue until the rate of the trained response approximated its pre-training rate. The criterion for continuing training was set at two standard deviations above the original baseline mean for whichever response had been treated the day before. There were a total of twenty-one probe and baseline sessions

per subject which included four baseline periods, nine treatment probe periods and eight return to baseline probe periods.

The probe observations were governed by the same rules which applied to the baseline observations. An observation session consisted of fifteen continuous twenty-second intervals. Each time interval was measured independently by the two observers. Every five-minute observation session was followed by a one-minute rest period. There were six five-minute observation sessions included in each probe. Only one subject was observed during a probe period.

The observers were never informed as to the treatment condition which preceded each probe. Neither were they informed about the response class being trained. All precautions were taken to insure and maintain the observers' ignorance as to the sequence of the experimental treatments.

Explanation of Training Conditions

There was one experimenter for all treatment conditions. Each of the three subjects were trained individually in three social interaction response classes. One response class was trained at a time. Each subject received the three fifteen-minute training conditions on one response class before another response class was introduced. There was only one response class trained by one fifteen-minute treatment condition on any one day.

Following the training session for a subject, a thirty-minute probe was conducted in the subjects' living area. After the probe was conducted, the next subject's training was initiated and then probed until all three subjects had been trained on one response class by one of the three treatment conditions.

The day following treatment for all subjects consisted of a return to baseline probe for each subject. Each of these probes was conducted in the same time block as that in which the subject was trained the day before. For each subject, training could not be initiated again until the criterion for return to baseline had been met. In order to meet the criterion, responding on the trained response the day before had to be below two standard deviations above the original baseline mean for that particular response during the return to baseline probe. If this criterion was not met, return to baseline probes would be conducted each successive day until responding reached that level. Once the criterion was reached, training was initiated again on the following day. Consequently, there was always at least one day in between training conditions for each subject. This sequence was continued until each subject was exposed to three treatment conditions for each response class.

The three training conditions of (A) modeling, (B) instructions and feedback, and (C) modeling, instructions

and feedback were the same for all three response classes. The setting and duration of each training condition were identical. The content of each training condition was specific to the response class and varied as a function of a different response class being introduced.

Condition A--Modeling on Video Tape

Under the modeling condition, the three responses were programmed on video tape. These tapes entailed one modeling session for each of the three response classes trained. All modeling sessions were taped in the subjects' living area and utilized the same two models.

Each response class attended to in the modeling condition consisted of a series of taped interactions between the male and female models. Scripts were provided the models prior to taping. The scripts consisted of response class specific interactions. For each response class, three interactions were programmed and they followed each other consecutively. Each interaction lasted approximately five minutes, making a total training period of fifteen minutes for each response class in the video-modeling condition.

Response 1 was defined as non-specific verbal interactions. The series of three interactions taped specific to this response class concerned topics of a general information, conversational nature. These interactions, listed in the order presented on tape, demonstrated talking about the

following: (1) earning signatures for special events, such as going to the movies, shopping or a basketball game, (2) participating in outdoor activities such as taking walks outside, playing various games and having picnics. Response 2 was defined as activity specific interaction responses. The series of three interactions taped specific to this response class concerned peer interaction in recreational activities. These interactions, listed in the order presented on tape pertained to the following: putting a puzzle together, playing checkers, and playing Monopoly.

Response 3 was defined as cooperation specific interaction responses. The series of three interactions specific to this response class concerned peers cooperating in a work related activity. These interactions listed in the order presented on tape pertained to the following: helping each other in sweeping the floor, straightening the living area, and picking up a game that was knocked on the floor.

When in the modeling treatment conditions, the subject was asked by the experimenter to enter the room where the training occurred. In this condition the subject was required to look at and listen to the training monitor. The monitor was played for the fifteen-minute training period with no instructions during the playing of the monitor. The experimenter was present during the condition. One of

three series of taped interactions, specific to the response class, was played during this time.

Before the monitor was turned on, the following prompts were given to the subject depending on the response class being trained:

Response 1--Non-specific Verbal Interaction Responses

"(Name), I am going to turn on the television. You will see two persons talking with each other. I want you to watch and listen closely to what they talk about and how much they enjoy talking with each other. Please don't ask me any questions while the television is playing."

Response 2--Activity Specific Interaction Responses

"(Name), I am going to turn on the television. You will see two persons having fun together. I want you to watch what they are doing and listen to what they say. Please don't ask me any questions while the television is playing."

Response 3--Cooperation Specific Interaction Responses

"(Name), I am going to turn on the television. You will see two persons helping each other do some work. I want you to watch what they are doing and listen to what they say. Please don't ask me any questions while the television is playing."

Condition B--Instructions and Feedback

In this training condition, the video tape monitor was not used and no modeling was programmed.

Training during this condition consisted of the experimenter instructing the subject and giving the subject feedback on his responding. General instructions in this condition consisted of having the subject maintain eye contact with the person he was talking with, having him speak at a moderate intensity, having him smile appropriately, and having him speak when someone spoke to him.

Each of the three response classes trained in this condition consisted of a series of peer interactions, the same as those used in the modeling condition.

Response 1 was defined as non-specific verbal interaction. The series of three examples used to demonstrate this response class were instructed by the experimenter in succession. They were: talking about special events, springtime, and what the residents did during the day.

Response 2 was defined as activity specific interaction responses. The series of three examples used to demonstrate this response class were instructed by the experimenter in succession. They were: putting a puzzle together, playing checkers, and playing Monopoly.

Response 3 was defined as cooperation specific interaction responses. The series of three examples used to demonstrate this response class were instructed by the

experimenter in succession. They were: sweeping the floor, straightening the living area, picking up a game.

For all instruction and feedback conditions, the subject was asked by the experimenter to enter the room where the training occurred. In this condition, the subject was required to follow the instructions of the experimenter.

Before training began, the following prompts were given the subject contingent on the response class being trained:

"(Name), I am going to want you to talk to me as if I were one of the residents in the cottage. I'll give you an example of something that might happen in the cottage. You are to talk to me about the example I give you."

The following are some of the responses trained during this condition and how they were trained:

Response 1--Non-specific Verbal Interaction Responses

"(Name), pretend I am a resident like yourself. Talk to me about what you did today." The subject begins. "(Name), that was good, but you forgot to say hello. You also were yelling across the room to me. Why don't you try it again but say hello and sit down first." Subject responds appropriately. "(Name), that was very good, why don't you continue."

The other examples were handled in the same manner as were the other response classes during this condition. For example:

Response 2--Activity Specific Interaction Responses

"(Name), pretend I am a resident like yourself. You want to play checkers. Show me what you would do." Subject begins. "(Name), you should ask the person to play, not interrupt him while he is talking with someone else." Subject responds appropriately by saying hello and asking the experimenter to play checkers. "(Name), you are doing better now, but you shouldn't throw the checkers on the floor when you make a mistake."

Response 3--Cooperation Specific Interaction Responses

"(Name), pretend I am a resident like yourself. I am picking up a game that someone knocked on the floor. Show me what you would do." Subject begins. "(Name), that's very good. It was nice of you to ask if you could help."

Condition C--Modeling-Video, and Instructions and Feedback

This condition implemented the procedures of conditions A and B. The monitor was present for playing the modeling sequences. The experimenter gave instructions and feedback for the subject's responses. The exact same examples from each response class were used.

The major difference between this condition and the previous two conditions was that modeling on video tape was combined with instructions and feedback for each response class, whereas these conditions were presented separately before.

Here, instead of the experimenter giving the subject an example of a response as in Condition B, the examples were taken from the modeling sequence on the monitor as in Condition A. The subject observed the models' interaction and at various points the experimenter stopped the tape of the models.

He then asked the subject to do what the models had done. The experimenter then gave instructions and feedback contingent on the appropriateness of the subject's response. General instructions as to the intensity of verbalizations, facial expression and the latency of responding was given to the subject.

Before training began, the following prompts were given the subject:

"(Name), I am going to turn on the television. You will see two persons (talking with each other), (having fun together) or (helping each other). I want you to watch and listen closely to what they say and do. I am going to stop the television and ask you to practice what the persons on television have done."

The following are examples of the three response classes using this treatment condition:

Response 1--Non-specific Verbal Interaction Responses

The television is stopped. "(Name), did you hear how the person said hello? I want you to try it now." Subject responds. "(Name), that was very good." Television

begins again. "(Name), what were they talking about?" Subject responds. "(Name), you try talking to me the same way they were talking to each other."

Response 2--Activity Specific Interaction Responses

The television is stopped. "(Name), did you hear how the person asked the other to play checkers? You try asking in the same way." Subject responds. "(Name), you did a very good job."

Response 3--Cooperation Specific Interaction Responses

The television is stopped. "(Name), what was the person doing?" Subject responds. "Did the person need help?" Subject responds. "Show me what you would do if I were picking the game up from the floor." Subject responds. "(Name), no, that isn't right. Try it again."

The following is the training sequence that occurred during this experiment. It is a listing of events, not the order of events. As noted earlier, all treatments and responses were counterbalanced during the treatment sessions.

Response 1--Non-specific Verbal Interaction Responses

_____ Probe Period--Treatment A (Modeling on Video Tape)

_____ Baseline Period

_____ Probe Period--Treatment B (Instructions and Feedback)

_____ Baseline Period

_____ Probe Period--Treatment C (Modeling, Instructions and Feedback)

_____ Baseline Period

Response 2--Activity Specific Interaction Responses

_____ Probe Period--Treatment A (Modeling on Video Tape)

_____ Baseline Period

_____ Probe Period--Treatment B (Instructions and Feedback)

_____ Baseline Period

_____ Probe Period--Treatment C (Modeling, Instructions and Feedback)

_____ Baseline Period

Response 3--Cooperation Specific Interaction Responses

_____ Probe Period--Treatment A (Modeling on Video Tape)

_____ Baseline Period

_____ Probe Period--Treatment B (Instructions and Feedback)

_____ Baseline Period

_____ Probe Period--Treatment C (Modeling, Instructions and Feedback)

_____ Baseline Period

Models

Modeling conditions, which were all performed on video tape, utilized two undergraduate students enrolled in a psychology course at the University of North Carolina at Greensboro. One male student and one female student, each twenty years old, were chosen as models. These models possessed physical attributes which were similar to those of the subjects. That is, they were of average height, weight and attractiveness. Their dress was modest but in keeping with current styles. As Bandura (1969)

reported, attention controlling variables may be related to various modeling stimuli. Since it was the intention of this study to emphasize the behaviors of the models, not their physical attributes, the physical cues of the models were kept to a minimum.

Both models were provided with a script, which they followed during taping. Modeling scripts changed, depending upon the response class being attended to by the experimenter.

The models were the same for all of the modeling conditions. There was no interaction between the models and the subjects during any segment of the research.

Equipment

Television video tape recordings were produced and played back on a portable, half-inch video tape recorder (Panasonic, FKJFF168). The monitor and recorder were located in a 15 X 20-foot area adjoining one of the living areas in the residential cottage.

Two stopwatches were used to measure the duration of observation intervals.

CHAPTER III

RESULTS

Reliability

Four observers, in consistent pairs, coded the five responses throughout all observation sessions allowing reliability to be measured during each session. Only one pair of observers coded the five responses during an observation session. The two pairs of observers were randomly assigned to observation periods. Table 3 presents the reliability across all responses for each training and baseline session for individual subjects. Reliability between observers was calculated by dividing the number of intervals in which both observers agreed that the target behavior occurred (agreements), by the number of intervals in which either but not both coded that the target behavior occurred (disagreements) plus the number of agreements. For Subject A, the mean of baseline reliability = .92; the mean reliability during training observations = .89; the overall reliability = .91. For Subject B, the mean of baseline reliability during training = .91; the mean reliability during training = .89; the overall reliability = .90. For Subject C, the mean of baseline reliability = .92; the mean reliability during training = .89; the overall reliability = .91.

TABLE 3

Reliability Measures Between Two Observers for All Observations

Session	D.A.[a]	Session	J.H.[a]	Session	B.T.[a]
Baseline	.95	Baseline	.96	Baseline	.90
Baseline	.90	Baseline	.89	Baseline	.94
Baseline	.89	Baseline	.90	Baseline	.89
Baseline	.88	Baseline	.88	Baseline	.95
T_A R_1	.93	T_B R_3	.89	T_C R_2	.87
Baseline	.96	Baseline	.85	Baseline	.87
T_B R_1	.89	T_C R_3	.91	T_A R_2	.94
Baseline	.85	Baseline	.97	Baseline	.91
T_C R_1	.82	T_A R_3	.86	T_B R_2	.78
Baseline	.90	Baseline	.91	Baseline	.93
T_B R_2	.82	T_C R_1	.90	T_A R_3	.90
Baseline	.92	Baseline	.88	Baseline	.93
T_C R_2	.86	T_A R_1	.91	T_B R_3	.83
Baseline	.95	Baseline	.94	Baseline	.92
T_A R_2	.91	T_B R_1	.85	T_T R_3	.88
Baseline	.93	Baseline	.92	Baseline	.95
T_C R_3	.92	T_A R_2	.88	T_B R_1	.91
Baseline	.95	Baseline	.92	Baseline	.96
T_A R_3	.91	T_B R_2	.91	T_C R_1	.91
Baseline	.97	Baseline	.93	Baseline	.91
T_B R_3	.92	T_C R_2	.88	T_A R_1	.95
Mean Baseline=.92		Mean Baseline=.91		Mean Baseline=.92	
Mean Training=.89		Mean Training=.89		Mean Training=.89	
Mean Total =.91		Mean Total =.90		Mean Total =.91	

TABLE 3 (continued)

Mean of Total Baseline Reliability	= .92
Mean of Total Training Reliability	= .89
Mean of Total Reliability	= .91
Mean of Reliability R_1	= .90
Mean of Reliability R_2	= .88
Mean of Reliability R_3	= .89

a = Mean of Six Sessions

T_A = Modeling

T_B = Instructions and Feedback

T_C = Modeling, Instructions and Feedback

R_1 = Non-specific Verbal Interaction

R_2 = Activity Specific Interaction

R_3 = Cooperative Specific Interaction

Collapsing over subjects and treatments, the reliability for Response 1, non-specific verbal interaction, = .90; for Response 2, activity specific interaction, reliability = .88; for Response 3, cooperation specific interaction, reliability = .89.

Thus, the observation procedure was considered to be adequately reliable for the purposes of the study.

Differences in Treatment Conditions and Response Conditions

Figures 1, 2 and 3 present the number of intervals of positive peer interaction for subjects D. A., J. H., and B. T., respectively, across all baseline and treatment conditions. Modeling always produced the least change in responding regardless of the response class being attended to, whereas the combination treatment of modeling, instructions and feedback, produced the greatest change in all response classes. The next most effective treatment was the condition of instructions and feedback. These variations in responding as a function of each treatment were consistent between subjects as well as within subjects.

The effects resulting from variations in the treated response classes were also consistent across the three subjects as can be seen in Figures 1, 2 and 3. Graphically, recreational responses or activity specific interactions showed the greatest change irrespective of the treatment condition imposed. Verbalizations or non-specific verbal

interactions were the next most frequently occurring response class. The response class showing the least graphic change was the cooperation specific interaction class, irrespective of the treatment condition imposed.

The statistical tests performed on these data proved highly supportive of the graphic representations. The raw data used in these analyses is presented in Appendix 2. Table 4 presents a summary of the three factor analysis of variance of the treatment conditions and response conditions based on baseline and probe period observations. Factor A, treatments, showed a highly significant main effect, thus supporting an overall difference between treatment conditions. Factor B was also highly significant which confirms the graphic differences between responses represented in Figures 1, 2, and 3. As suspected, the analysis yielded an extremely large difference in factor C, baseline periods versus probe periods.

The statistical analysis also yielded an overall significant ABC interaction, indicating that the baseline probe differences varied as a function of combinations of treatment conditions and response modes trained. The Omega square (W^2) analysis on each factor yielded an overall strength of association of 97.5%. This indicates that 97.5% of the variance in this experiment was accounted for by the independent variables manipulated. Since this interaction was significant, a comparison of mean differences for each level of each factor was made.

FIGURE 1

Number of Intervals of Three Treated Social Responses as a Function of Three Treatment Conditions for Subject D. A.

(Each trial represents responding for six successive five-minute observation periods.)

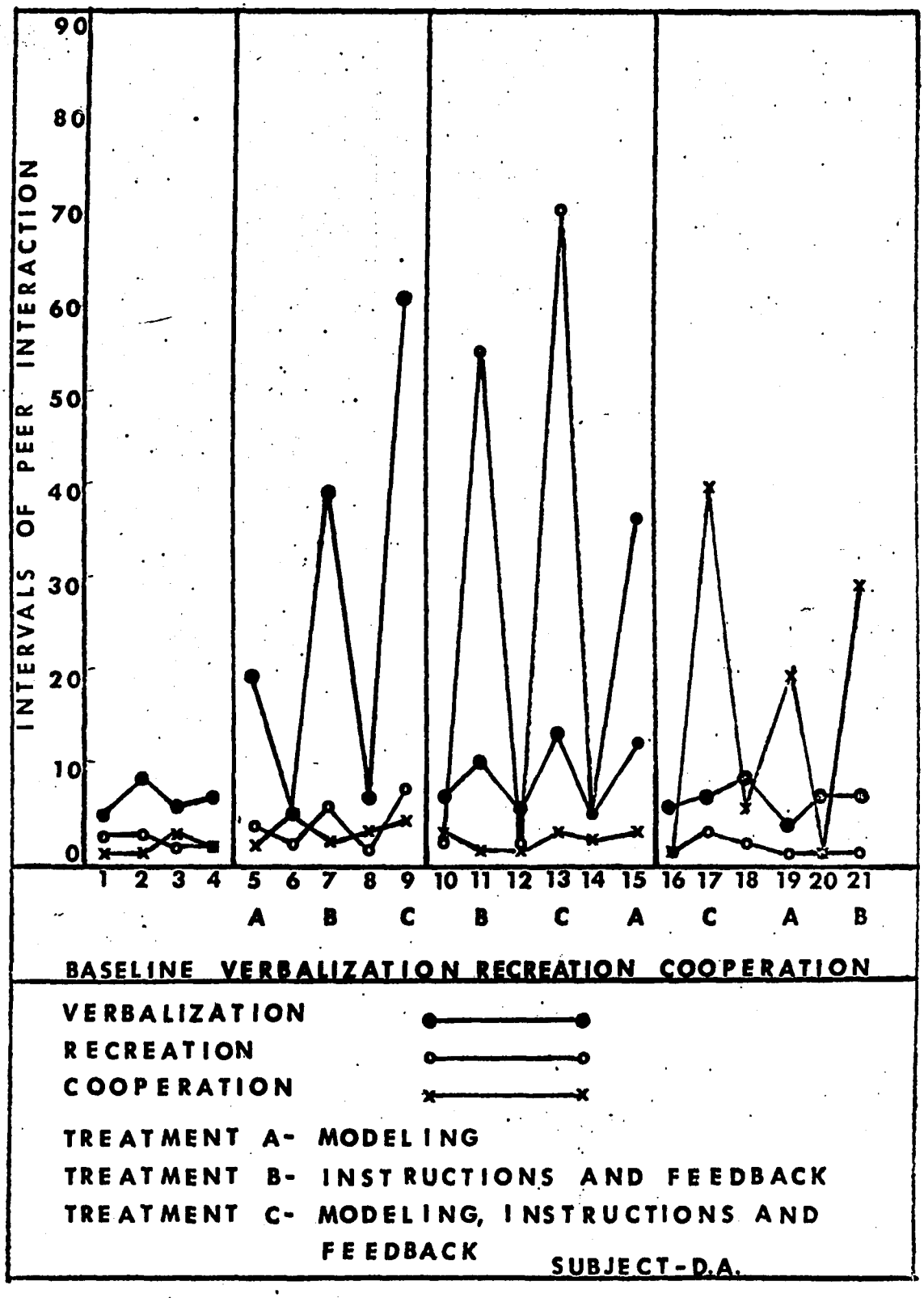

INTERVALS OF PEER INTERACTION
90
80
70
60
50
40
30
20
10
0
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21
A B C B C A C A B
BASELINE VERBALIZATION RECREATION COOPERATION
VERBALIZATION
RECREATION
COOPERATION
TREATMENT A- MODELING
TREATMENT B- INSTRUCTIONS AND FEEDBACK
TREATMENT C- MODELING, INSTRUCTIONS AND FEEDBACK
SUBJECT-D.A.

FIGURE 2

Number of Intervals of Three Treated Social Responses as a Function of Three Treatment Conditions for Subject J. H.

(Each trial represents responding for six successive five-minute observation periods.)

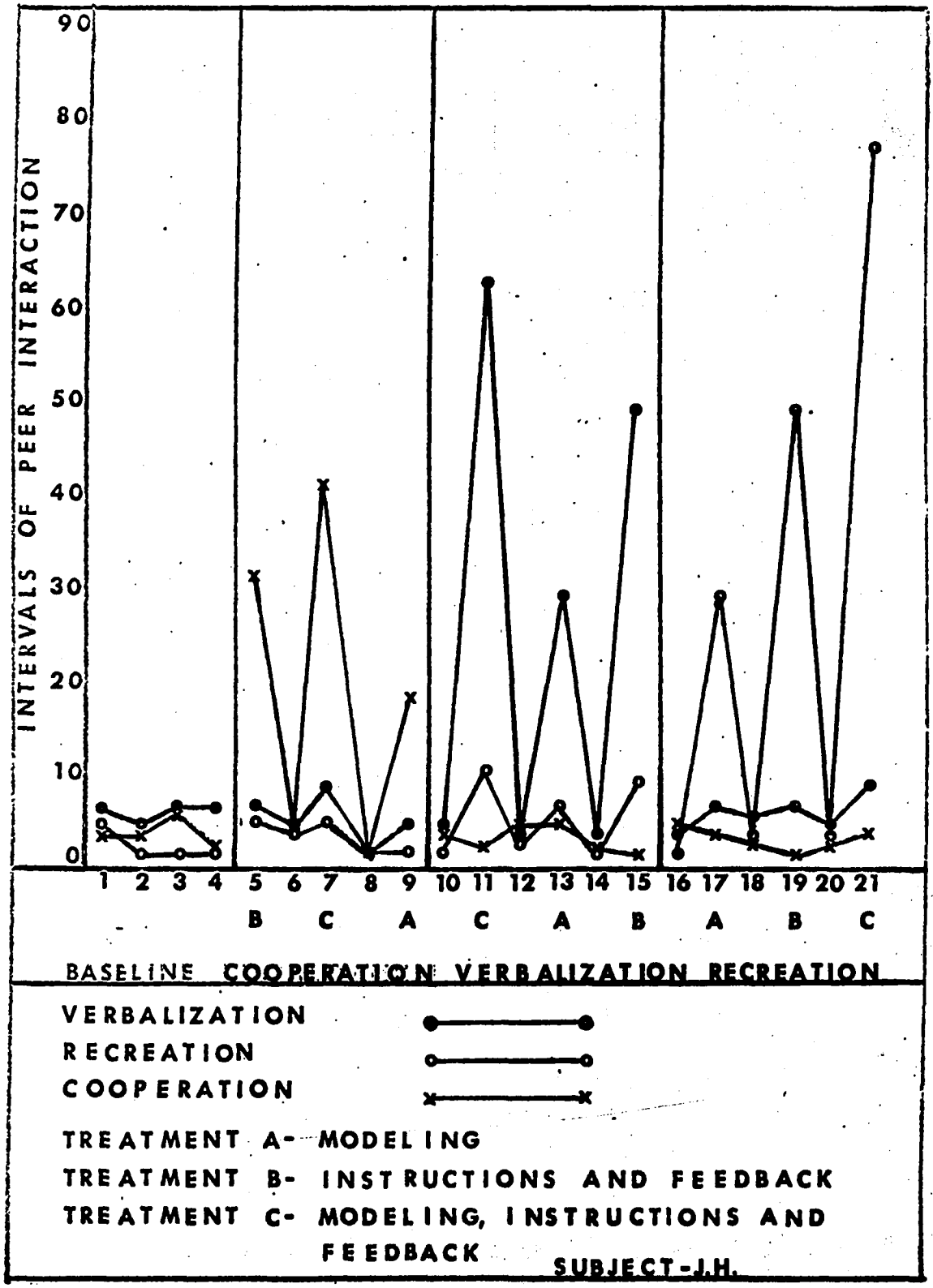
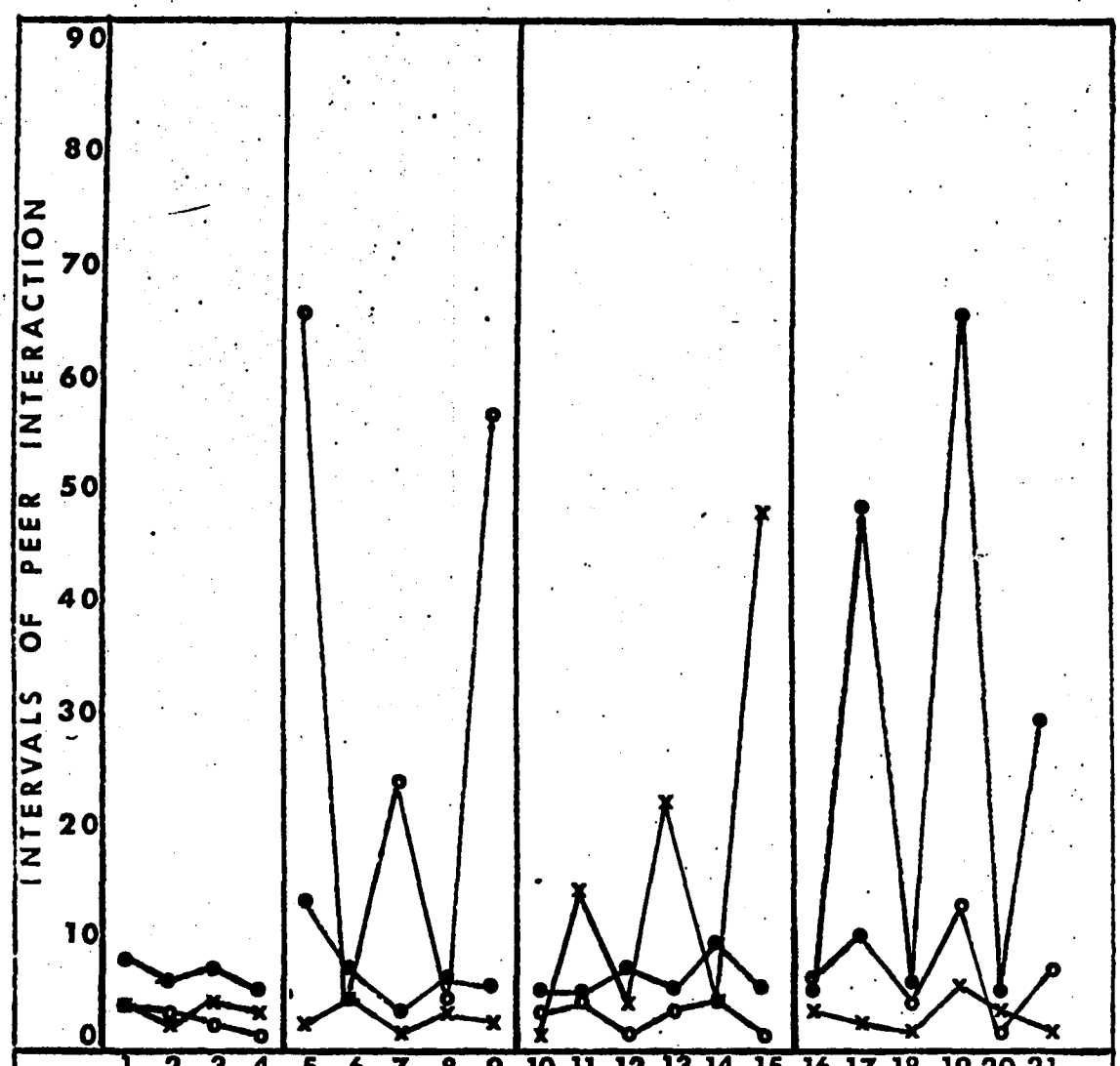

INTERVALS OF PEER INTERACTION
90
80
70
60
50
40
30
20
10
0
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21
B C A C A B A B C
BASELINE COOPERATION VERBALIZATION RECREATION
VERBALIZATION
RECREATION
COOPERATION
TREATMENT A- MODELING
TREATMENT B- INSTRUCTIONS AND FEEDBACK
TREATMENT C- MODELING, INSTRUCTIONS AND FEEDBACK
SUBJECT-J.H.

FIGURE 3

Number of Intervals of Three Treated Social Responses as a Function of Three Treatment Conditions for Subject B. T.

(Each trial represents responding for six successive five-minute observation periods.)



VERBALIZATION

RECREATION

COOPERATION

TREATMENT A- MODELING

TREATMENT B- INSTRUCTIONS AND FEEDBACK

TREATMENT C- MODELING, INSTRUCTIONS AND FEEDBACK

SUBJECT-B.T.

TABLE 4

Analysis of Variance of Treatment and Response Conditions Based on Baseline and Probe Periods

Source of Variation	Sum of Squares	Degrees of Freedom	Mean Squares	F	W^2
Blocks	.54	2	.27		
Treatments	28032.41	17			
Treatments (A)	2859.60	2	1429.80	164.91*	.10
Responses (B)	1158.65	2	579.33	66.82*	.04
Base-Probe (C)	20128.74	1	20128.74	2321.65*	.71
AB	93.73	4	23.43	2.70	.002
AC	2709.00	2	1354.50	156.23*	.09
BC	955.84	2	477.92	55.12*	.03
ABC	126.85	4	31.71	3.66**	.003
Residual	303.59	35	8.67		
Total	28336.54	54			.975

*$p < .01$

**$p < .05$

Table 5 presents the summary of three Newman Keuls tests between means of each treatment condition at baseline periods and probe periods collapsing over Factor B, responses. These analyses confirm the preceding results. It is readily apparent that regardless of which response is being trained, each treatment condition produced a significant increase over baseline responding.

Newman Keuls tests of mean differences between responses B at baseline and responses at the probe period collapsing over factor A, treatments, are presented in Table 6. Verbalizations, recreational responses and cooperative responses each showed a significant increase in the probe period over the baseline period.

Tables 7, 8 and 9 summarize Newman Keuls test of mean differences between each level of treatments and each level of responses at the baseline period and each corresponding level of treatments and responses at the probe period. Table 5 presents three tests of mean differences which indicate that modeling was effective in increasing each response class significantly above baseline responding. Table 6 presents three tests of mean differences which indicate that instructions and reinforcement were effective in increasing each response class significantly above baseline responding. Table 7 shows a similar increase in probe responding over baseline responding when the combination of treatment conditions, modeling, instructions and

TABLE 5

Newman Keuls Test of Mean Differences Between Treatments at Baseline and Treatments at Probe Collapsing over Responses

	MEAN	MOD BASE	MOD PROBE
MODELING BASELINE	2.08	-	20.80*
MODELING PROBE	22.88		-

*p < .01

	MEAN	INST-FEED BASE	MOD-INST PROBE
INSTRUCT, FEED BASELINE	2.32	-	39.56*
INSTRUCT, FEED PROBE	41.88		-

*p < .01

	MEAN	MOD-INST-FEED BASE	MOD-INST-FEED PROBE
MOD,INSTRUCT,FEED BASELINE	2.6	-	52.06*
MOD,INSTRUCT,FEED PROBE	54.66		-

*p < .01

TABLE 6

Newman Keuls Test of Mean Differences Between Responses at Baseline and Responses at Probe Collapsing over Treatments

	MEAN	VERB BASE	VERB PROBE
VERBALIZATION BASELINE	3.86	-	36.25*
VERBALIZATION PROBE	40.11		-

*p < .01

	MEAN	REC BASE	REC PROBE
RECREATION BASELINE	1.70	-	48.60*
RECREATION PROBE	50.30		-

*p < .01

	MEAN	COOP BASE	COOP PROBE
COOPERATION BASELINE	1.43	-	27.56*
COOPERATION PROBE	28.99		-

*p < .01

TABLE 7

Newman Keuls Test of Mean Differences Between Baseline and Probe for Treatment and Response Combinations

	MEAN	MOD,VERB,BASE	MOD,VERB,PROBE
MODELING VERBALIZATION BASELINE	4.0	-	19.00
MODELING VERBALIZATION PROBE	23.0		-

*p < .01

	MEAN	MOD,REC,BASE	MOD,REC,PROBE
MODELING RECREATION BASELINE	1.6	-	27.4*
MODELING RECREATION PROBE	29.0		-

*p < .01

	MEAN	MOD,COOP,BASE	MOD,COOP,PROBE
MODELING COOPERATION BASELINE	.66	-	16.00
MODELING COOPERATION PROBE	16.66		-

*p < .01

TABLE 8

Newman Keuls Test of Mean Differences Between Baseline and Probe for Treatment and Response Combinations

	MEAN	INST-FEED VERB,BASE	INST-FEED VERB,PROBE
INSTRUCT,FEEDBACK VERBALIZATION BASELINE	3.3	-	41.7*
INSTRUCT,FEEDBACK VERBALIZATION PROBE	45.0		-

*p < .01

	MEAN	INST-FEED REC,BASE	INST-FEED REC,PROBE
INSTRUCT,FEEDBACK RECREATION BASELINE	2.0	-	51.0*
INSTRUCT,FEEDBACK RECREATION PROBE	53.0		-

*p < .01

	MEAN	INST-FEED COOP,BASE	INST-FEED COOP,PROBE
INSTRUCT,FEEDBACK COOPERATION BASELINE	1.65	-	26.01*
INSTRUCT,FEEDBACK COOPERATION PROBE	27.66		-

*p < .01

TABLE 9

Newman Keuls Test of Mean Differences Between Baseline and Probe for Treatment and Response Combinations

	MEAN	MOD-INST-FEED VERB,BASE	MOD-INST-FEED VERB,PROBE
MOD,INSTRUCT,FEED VERBALIZATION BASELINE	4.3	-	48.03*
MOD,INSTRUCT,FEED VERBALIZATION PROBE	52.33		-

*p < .01

	MEAN	MOD-INST-FEED REC,BASE	MOD-INST-FEED REC,PROBE
MOD,INSTRUCT,FEED RECREATION BASELINE	1.5	-	67.5*
MOD,INSTRUCT,FEED RECREATION PROBE	69.0		-

*p < .01

	MEAN	MOD-INST-Feed COOP,BASE	MOD-INST-FEED COOP,PROBE
MOD,INSTRUCT,FEED COOPERATION BASELINE	2.0	-	40.66*
MOD,INSTRUCT,FEED COOPERATION PROBE	42.66		-

*p < .01

feedback was implemented. Tables 7, 8, and 9 also show changes in Factor B, responses, where at each level of treatment consistent increases are noted over baseline responding.

Tables 10 and 11 present Newman Keuls tests of mean differences for baseline period responding and probe period responding respectively. At each level of C mean differences between responses were analyzed specific to each treatment condition. No differences were found between responses during the baseline period as noted in Table 5. Table 6 however shows that responses differ at each level of the treatment conditions during probe periods. Recreational responses occurred in significantly more intervals than either verbalizations or cooperative responses. Although this difference was quite consistent across all treatment conditions, the frequency of all response classes varied as a function of which treatment condition was imposed. That is, more responding occurred in all responses when modeling, instructions and feedback were used in combination than when the conditions were administered separately.

Tables 12 and 13 present Newman Keuls tests of mean differences for baseline period responding and probe period responding respectively. At each level of C, mean differences between treatments were assessed specific to each response condition. Here again, at baseline,

TABLE 10

Newman Keuls Test of Mean Differences Between Levels of Response and Treatments at Baseline

MODELING

	MEAN	VERB	REC	COOP
VERBALIZATION	4.00	-	2.4	3.34
RECREATION	1.60		-	.94
COOPERATION	.66			-

$p > .05$

INSTRUCTIONS AND FEEDBACK

	MEAN	VERB	REC	COOP
VERBALIZATION	3.30	-	1.3	1.65
RECREATION	2.00		-	.35
COOPERATION	1.65			-

$p > .05$

MODELING, INSTRUCTIONS AND FEEDBACK

	MEAN	VERB	REC	COOP
VERBALIZATION	4.30	-	2.80	2.30
RECREATION	1.50		-	.50
COOPERATION	2.00			-

$p > .05$

TABLE 11

Newman Keuls Test of Mean Differences Between Levels of Responses and Treatments at Probe

MODELING (A_1)				
	MEAN	VERB	REC	COOP
VERBALIZATION	23.00	-	6.00*	6.34*
RECREATION	29.00		-	12.34*
COOPERATION	16.66			-

*p < .01

INSTRUCTIONS AND FEEDBACK (A_2)				
	MEAN	VERB	REC	COOP
VERBALIZATION	45.00	-	8.00*	17.34*
RECREATION	53.00		-	25.34*
COOPERATION	27.66			-

*p < .01

MODELING, INSTRUCTIONS AND FEEDBACK (A_3)				
	MEAN	VERB	REC	COOP
VERBALIZATION	52.33	-	16.67*	9.67*
RECREATION	69.00		-	26.34*
COOPERATION	42.66			-

*p < .01

TABLE 12

Newman Keuls Test of Mean Differences Between Levels of Treatments and Responses at Baseline

VERBALIZATION

	MEAN	MOD	INST,FEED	MOD,INST,FEED
MODELING	4.0	-	.7	.3
INSTRUCT FEEDBACK	3.3		-	1.0
MODELING INSTRUCT FEEDBACK	4.3			-

p > .05

RECREATION

	MEAN	MOD	INST,FEED	MOD,INST,FEED
MODELING	1.6	-	.4	.3
INSTRUCT FEEDBACK	2.0		-	.5
MODELING INSTRUCT FEEDBACK	1.5			-

p > .05

COOPERATION

	MEAN	MOD	INST,FEED	MOD,INST,FEED
MODELING	.66	-	.99	1.34
INSTRUCT FEEDBACK	1.65		-	.35
MODELING INSTRUCT FEEDBACK	2.00			-

p > .05

TABLE 13

Newman Keuls Test of Mean Differences Between Levels of Treatments and Responses at Probe

VERBALIZATION

	MEAN	MOD	INST,FEED	MOD,INST,FEED
MODELING	23.00	-	22.00*	29.33*
INSTRUCT FEEDBACK	45.00		-	7.33*
MODELING INSTRUCT FEEDBACK	52.33			-

*p < .01

RECREATION

	MEAN	MOD	INST,FEED	MOD,INST,FEED
MODELING	29.00		24.00*	40.00*
INSTRUCT FEEDBACK	53.00		-	16.00*
MODELING INSTRUCT FEEDBACK	69.00			-

*p < .01

COOPERATION

	MEAN	MOD	INST,FEED	MOD,INST,FEED
MODELING	16.66	-	11.00*	26.00*
INSTRUCT FEEDBACK	27.66		-	15.00*
MODELING INSTRUCT FEEDBACK	42.66			-

*p < .01

treatment conditions did not differ. During the probe period however the treatment conditions differed significantly at each level of the response condition. Modeling, instructions and feedback consistently produced more responding in each response class than either modeling or instructions and feedback. The instructions and feedback condition was consistently second in the level of responding associated with it, while modeling alone produced the least change in responding.

During probe periods, as indicated in Tables 11 and 13, treatment conditions differed significantly in how they affected each response class. There was a corresponding hierarchy resulting from the response condition tests of mean differences. Recreational responses occurred significantly more often than either verbalizations or cooperative responses in each treatment condition. Verbalization responses were consistently second in the level of responding associated with each treatment condition while cooperative responses showed the least change in each treatment condition.

Tables 14 and 15 complete the mean comparisons specific to the ABC interaction noted in Table 4. The two comparisons here attend specifically to the mean differences between responses during the probe period. Table 14 presents data which indicate that regardless of which response class being trained, the combination treatment of modeling,

TABLE 14

Newman Keuls Test of Mean Differences Between Levels of Treatments at Probe Collapsing over Responses

	MEAN	MOD	INST.FEED	MOD,INST,FEED
MODELING	22.88	-	19.01*	31.78*
INSTRUCT FEEDBACK	41.89		-	12.77*
MODELING INSTRUCT FEEDBACK	54.66			-

*p < .01

TABLE 15

Newman Keuls Test of Mean Differences Between Levels of Responses at Probe Collapsing over Treatments

	MEAN	VERB	REC	COOP
VERBALIZATION	40.11	-	10.22*	11.12*
RECREATION	50.33		-	21.34*
COOPERATION	28.99			-

*p < .01

instructions and feedback proved superior to the other two conditions. The second hypothesis was also supported in that instructions and feedback was the next most effective treatment condition.

Table 15 presents mean comparisons of probe period responding which indicate that recreational responses occurred in significantly more intervals than the other two response classes. Verbalizations in turn occurred in a significantly greater number of intervals than cooperative responses in probe periods as well.

Treatment Order

The design used in this experiment counterbalanced the presentation of treatment conditions for each subject. To further demonstrate that the order of presentation was an irrelevant variable, three one-way analyses of variance were performed, one per subject, based on the order of the treatment conditions presented the subject collapsing over responses. The analyses performed were not significant ($F = .037$, $p > .05$; $F = .143$, $p > .05$; $F = .032$, $p > .05$ respectively for subjects 1, 2 and 3). Thus confirming the fact that the counterbalance for order was effective.

Three additional one-way analyses were performed, one per response class, based on the order of presentation of the block of treatment conditions collapsing over subjects. That is, did it matter whether a response was trained with one counterbalanced order of treatments versus another?

The results of these analyses were not significant ($F = .170$, $p > .05$; $F = .085$, $p > .05$; $F = .015$, $p > .05$ respectively for responses 1, 2 and 3), thus confirming that order was not a significant variable in this experiment.

Effects on Untreated Responses

In Figures 1, 2 and 3, there is a trend which suggests that when certain responses were trained there were, in certain cases, effects on the untreated responses. This section deals with the statistical analyses performed on the untreated responses.

Table 16 presents the summary of the analysis of variance for responses 2 and 3 when response 1 is treated; response 1 is verbal responding; response 2 is recreational responding; response 3 is cooperative responding. The results here show that the interaction between Factor A, treatments, and Factor C, baseline and probe periods, was significant indicating that baseline and probe periods were affected differentially by the treatment conditions. Additionally there was a significant interaction between Factor B, responses, and Factor C, baseline-probe, indicating that treatment on verbalizations had differential effects on the baseline and probe responding of recreational responses and cooperative responses.

Newman Keuls tests of mean differences based on the interactions summarized in Table 16 are presented in Tables 17, 18, 19 and 20.

TABLE 16

Analysis of Variance of Untreated Recreation and Cooperation Responses When Verbalization Responses Are Treated

Source of Variation	Sum of Squares	Degrees of Freedom	Mean Squares	F	W^2
Blocks	8.57	2	4.28		
Treatments	264.72	11	6.46		
Treatments (A)	12.92	2	57.50	2.64	.02
Responses (B)	57.50	1	70.84	23.47*	.17
Base-Probe (C)	70.84	1	4.71	28.91*	.21
AB	9.43	2	10.88	1.92	.01
AC	21.77	2	88.04	4.44**	.05
BC	88.04	1	2.11	35.93*	.26
ABC	4.22	2	2.45	.86	.002
Residual	53.93	22			
Total	327.22	35			.722

*$p < .01$

**$p < .05$

Table 17 presents mean comparisons between each treatment condition at the baseline period versus the probe period. Clearly, the combination of modeling, instructions and feedback was the only condition which produced significant increases over baseline responding. Thus, the strength of this condition was sufficient to bring about changes in responding on untreated responses.

Table 18 presents mean comparisons between each response at the baseline period versus the probe period. As an untreated response, recreational responses increased significantly over baseline levels, while cooperative responses did not change significantly from baseline.

Table 19 presents mean comparison between levels of treatments collapsing over responses. No differences were found during the baseline condition; however, the analysis at the probe period revealed that modeling, instructions and feedback was superior to the other conditions in effecting change in the untreated responses.

Table 20 presents mean comparisons between responses at baseline and then at the probe period while collapsing over treatments. At baseline the two untreated responses did not differ; however, testing at the probe period revealed that recreational responses occurred in a significantly higher number of intervals than cooperative responses.

In summary, when verbalizations are trained, there is a significant increase in recreational responses over

baseline responding; however, no such change is evident in regard to cooperative responses.

Table 21 presents the summary table for the analysis of variance performed when response 2, recreation, was the treated response and responses 1 and 3, verbalization and cooperation respectively, were untreated. This analysis showed that Factor B, responses, was significant thus indicating an overall difference between untreated responding. The tests of mean differences between the two levels of this factor indicate that verbalizations occurred at a higher rate than cooperative responses. This resulted when collapsing over treatments (A) and the baseline-probe periods (C). Consequently, when recreational responses were trained, there was a significant increase in verbalizations but no increase over baseline in cooperative responses.

Table 23 presents the summary table for the analysis of variance performed when response 3, cooperation, was the treated response and responses 1 and 2, verbalization and recreation respectively, were untreated. This analysis showed that Factor B, responses, was significant, thus indicating an overall difference between untreated responding. The tests of mean differences between the two levels of this factor indicate that verbalizations occurred at a higher rate than recreational responses. This resulted when collapsing over treatments (A) and the baseline probe periods (C). Consequently, when cooperative responses were

TABLE 17

Newman Keuls Test of Mean Differences Between Baseline and Probe for the Treatments Collapsing over Responses

	MEAN	MOD,BASE	MOD,PROBE
MODELING BASELINE	1.42	-	1.58
MODELING PROBE	3.00		-

$p > .05$

	MEAN	INST-FEED BASE	INST-FEED PROBE
INSTRUCT,FEEDBACK BASELINE	2.17	-	1.83
INSTRUCT,FEEDBACK PROBE	4.00		-

$p > .05$

	MEAN	MOD-INST-FEED BASE	MOD-INST-FEED PROBE
MOD,INSTRUCT,FEED BASELINE	1.17	-	5.00*
MOD,INSTRUCT,FEED PROBE	6.17		-

*$p < .01$

TABLE 18

Newman Keuls Test of Mean Differences Between Baseline and Probe at Responses Collapsing over Treatments

	MEAN	REC,BASE	REC,PROBE
RECREATION BASELINE	3.75	-	17.85*
RECREATION PROBE	21.60		-

*p < .01

	MEAN	COOP,BASE	COOP,PROBE
COOPERATION BASELINE	5.66	-	.99
COOPERATION PROBE	4.67		-

p > .05

TABLE 19

Newman Keuls Test of Mean Differences Between Levels of Treatments at Baseline and Probe Collapsing over Responses

BASELINE

	MEAN	MOD	INST-FEED	MOD-INST-FEED
MODELING	1.42	-	.75	.25
INSTRUCT FEEDBACK	2.17		-	1.00
MODELING INSTRUCT FEEDBACK	1.17			-

$p > .05$

PROBE

	MEAN	MOD	INST-FEED	MOD-INST-FEED
MODELING	3.00	-	1.00	3.17*
INSTRUCT FEEDBACK	4.00		-	2.17
MODELING INSTRUCT FEEDBACK	6.17			-

*$p < .01$

TABLE 20

Newman Keuls Test of Mean Differences Between Levels of Responses at Baseline and Probe Collapsing over Treatments

BASELINE

	MEAN	REC	COOP
RECREATION	3.75	-	1.91
COOPERATION	5.66		-

$p > .05$

PROBE

	MEAN	REC	COOP
RECREATION	21.60	-	16.93*
COOPERATION	4.67		-

*$p < .01$

TABLE 21

Analysis of Variance of Untreated Verbalization and Cooperation Responses when Recreation Responses Are Treated

Source of Variation	Sum of Squares	Degrees of Freedom	Mean Squares	F	W^2
Blocks	21.4	2			
Treatments	171.29	11			
Treatments (A)	0	2	0	0	.00
Responses (B)	157.09	1	157.09	34.75*	.49
Base-Probe (C)	5.60	1	5.60	1.24	.003
AB	4.16	2	2.08	.46	.00
AC	1.74	2	.87	.19	.00
BC	1.30	1	1.30	.29	.00
ABC	1.40	2	.70	.15	.00
Residual	99.43	22	4.52		
Total	292.12	35			.493

*$p < .01$

TABLE 22

Newman Keuls Test of Mean Differences Between Levels of Responses Collapsing over Treatments and Base-Probe

	MEAN	VERB	COOP
VERBALIZATION	33.50	-	25.07*
COOPERATION	8.43		-

*p < .01

TABLE 23

Analysis of Variance of Untreated Verbalization and Recreation Responses when Cooperation Responses Are Treated

Source of Variation	Sum of Squares	Degrees of Freedom	Mean Squares	F	W^2
Blocks	3.31	2	1.7		
Treatments	134.65	11			
Treatments (A)	9.56	2	4.78	1.45	.01
Responses (B)	116.46	1	116.46	35.29*	.53
Base-Probe (C)	.31	1	.13	.04	.00
AB	4.21	2	2.10	.64	.00
AC	.94	2	.47	.14	.00
BC	1.22	1	1.22	.37	.00
ABC	1.95	2	.98	.30	.00
Residual	72.56	22	3.30		
Total	210.52	35			.54

*$p < .01$

TABLE 24

Newman Keuls Test of Mean Differences Between Levels of Responses Collapsing over Treatments and Base-Probe

	MEAN	VERB	REC
VERBALIZATION	28.80	-	21.55*
RECREATION	7.25		-

*p < .01

trained, there was a significant increase in verbalizations but no increase over baseline in recreational responses.

Three t-tests were performed to determine which response when treated produced the largest effect in a given untreated response. These analyses were performed by collapsing over subjects and treatments. The first t-test compared the differences in untreated verbalization responses when recreational responses were trained as opposed to training on cooperative responses. The results indicated no difference in the increase in verbalization responses as a function of training on these two responses ($t = 1.63$; $df = 8$; $p > .05$). Thus, for an increase in untreated verbalization responses, it did not matter whether recreational or cooperative responses were trained. Similar results were obtained when cooperative responses were untreated. That is, when verbalization responses and recreational responses were treated, there was no significant difference between their effect on untreated cooperative responses ($t < 1.00$; $df = 8.00$; $p > .05$).

The final t-test demonstrated a significant difference in untreated recreational responding depending on which response was treated ($t = 3.87$; $df = 8$; $p < .01$). It was found that a larger number of recreational responses occurred when verbalization responses were treated than when cooperative responses were treated.

Inappropriate Responses

An analysis of variance of differences from baseline of inappropriate responses as a function of the treatment conditions is presented in Table 25. Both treatment condition and response condition main effects were significant. Therefore, there were independent increases in inappropriate responding as a function of both the treatment and response conditions imposed. However, planned comparisons presented in Table 26 showed no significant differences for conditions within either factor. The means of inappropriate responses do, however, show some trends. The two maximal conditions of modeling, instructions and feedback with recreational responses have the highest rates of inappropriate behavior associated with them, although the differences here were not significant. Figures 4, 5 and 6 depict these trends for each subject. The raw data for inappropriate responses is presented in Appendix C.

Probe Period Observations for Three Response Conditions and Three Treatment Conditions

Figures 7, 8, and 9 depict each subject's response level at successive intervals of time following the treatment session for the three treatment conditions and the three response conditions.

Each response is represented as a function of the three treatment conditions. All subjects show a decline in responding over the thirty-minute probe period.

FIGURE 4

Number of Intervals of Inappropriate and No Peer Interaction for Subject D. A.

(Each trial represents responding for six successive five-minute observation periods.)

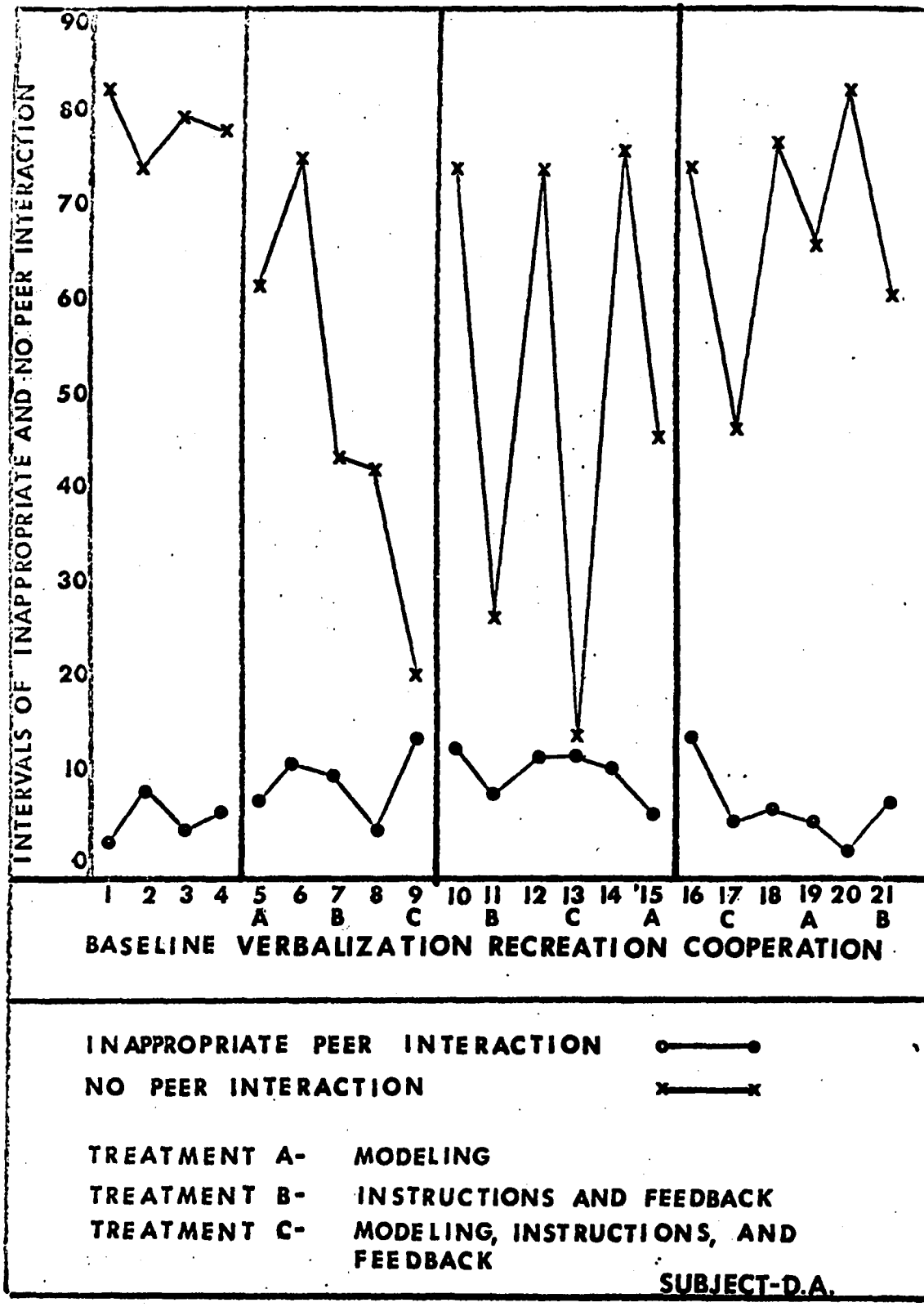

INTERVALS OF INAPPROPRIATE AND NO PEER INTERACTION
90
80
70
60
50
40
30
20
10
0
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21
A B C B C A C A B
BASELINE VERBALIZATION RECREATION COOPERATION
INAPPROPRIATE PEER INTERACTION
NO PEER INTERACTION
TREATMENT A- MODELING
TREATMENT B- INSTRUCTIONS AND FEEDBACK
TREATMENT C- MODELING, INSTRUCTIONS, AND FEEDBACK
SUBJECT-D.A.

FIGURE 5

Number of Intervals of Inappropriate and No Peer Interaction for Subject J. H.

(Each trial represents responding for six successive five-minute observation periods.)

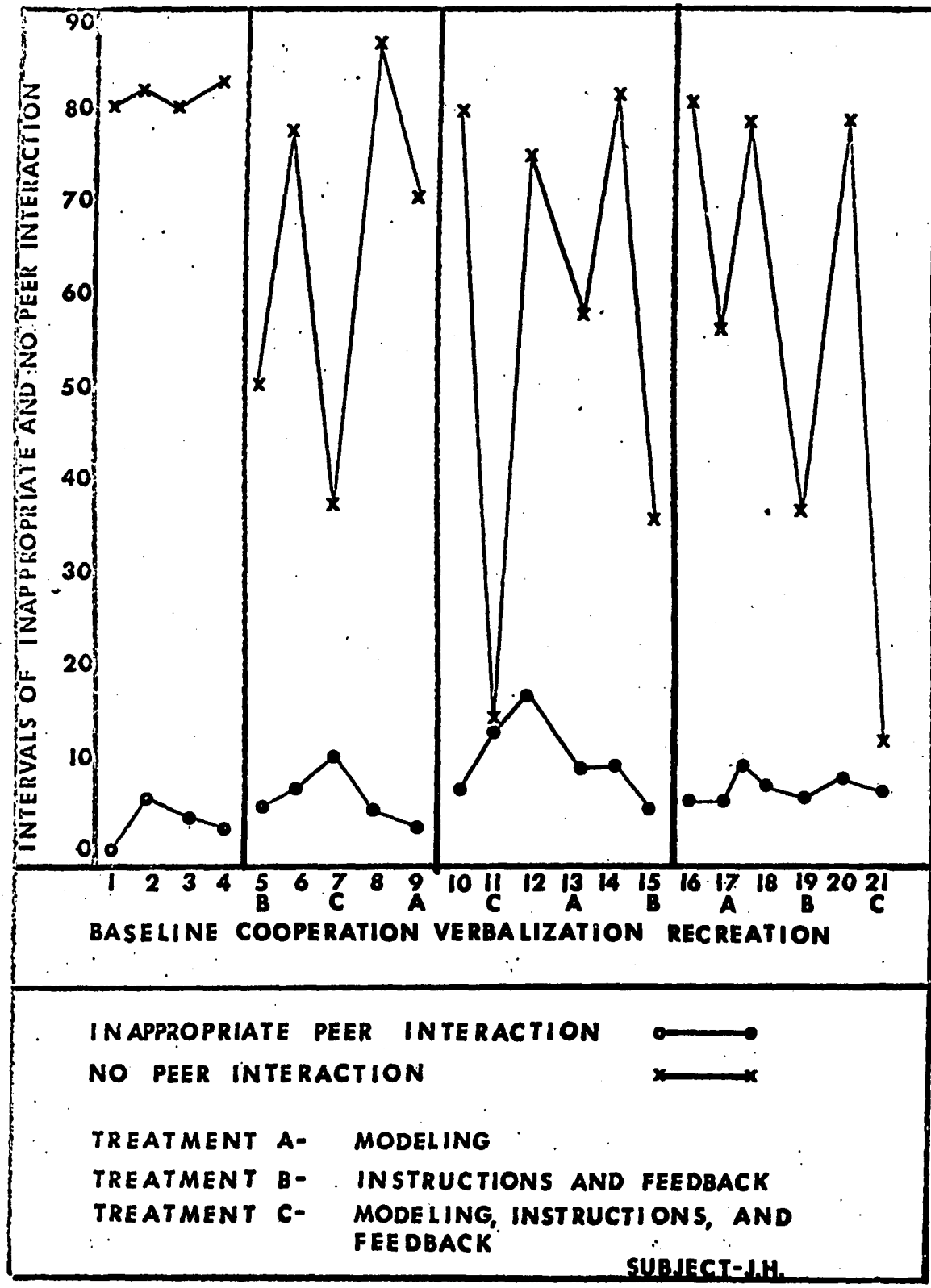

INTERVALS OF INAPPROPRIATE AND NO PEER INTERACTION
90
80
70
60
50
40
30
20
10
0
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21
B C A C A B A B C
BASELINE COOPERATION VERBALIZATION RECREATION
INAPPROPRIATE PEER INTERACTION
NO PEER INTERACTION
TREATMENT A- MODELING
TREATMENT B- INSTRUCTIONS AND FEEDBACK
TREATMENT C- MODELING, INSTRUCTIONS, AND FEEDBACK
SUBJECT-J.H.

FIGURE 6

Number of Intervals of Inappropriate and No Peer Interaction for Subject B. T.

(Each trial represents responding for six successive five-minute observation periods.)

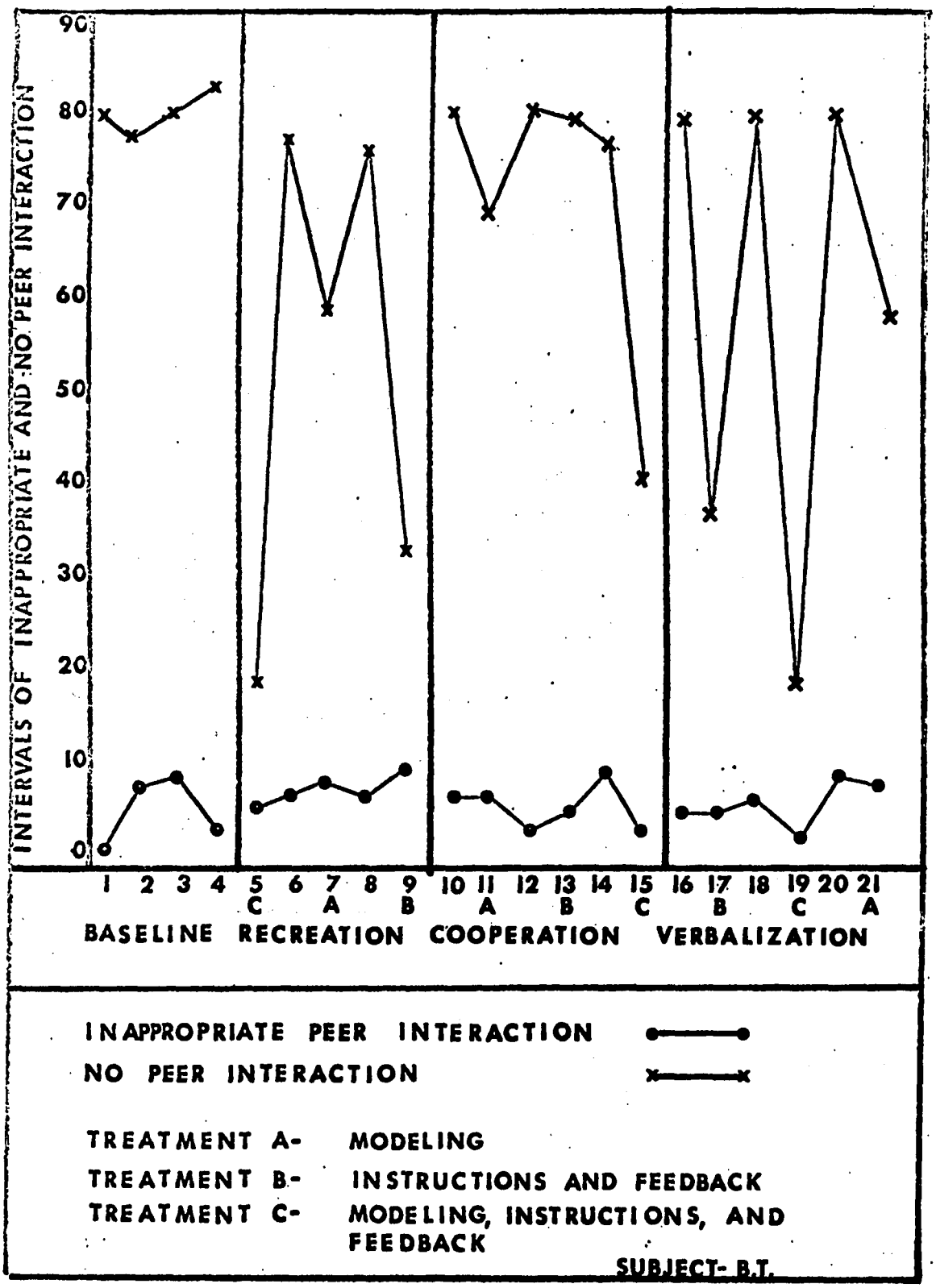

INTERVALS OF INAPPROPRIATE AND NO PEER INTERACTION
90
80
70
60
50
40
30
20
10
0
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21
C A B A B C B C A
BASELINE RECREATION COOPERATION VERBALIZATION
INAPPROPRIATE PEER INTERACTION
NO PEER INTERACTION
TREATMENT A- MODELING
TREATMENT B- INSTRUCTIONS AND FEEDBACK
TREATMENT C- MODELING, INSTRUCTIONS, AND FEEDBACK
SUBJECT- B.T.

TABLE 25

Analysis of Variance of Inappropriate Responding Based on Baseline and Probe Periods

Source of Variation	Sum of Squares	Degrees of Freedom	Mean Squares	F	W^2
Blocks	21.4	2			
Treatments	171.29	11			
Treatments (A)	0	2	0	0	.00
Responses (B)	157.09	1	157.09	34.75*	.49
Base-Probe (C)	5.60	1	5.60	1.24	.003
AB	4.16	2	2.08	.46	.00
AC	1.74	2	.87	.19	.00
BC	1.30	1	1.30	.29	.00
ABC	1.40	2	.70	.15	.00
Residual	99.43	22	4.52		
Total	292.12	35			.493

*p <.01

TABLE 26

Newman Keuls Test of Mean Differences Between Levels of Treatments and Between Levels of Responses Collapsing over Baseline and Probe

	MEAN	MOD	INST-FEED	MOD-INST-FEED
MODELING	6.22	-	.59	.56
INSTRUCT FEEDBACK	5.63		-	1.15
MODELING INSTRUCT FEEDBACK	6.78			-

$p > .05$

	MEAN	VERB	REC	COOP
VERBALIZATION	6.77	-	.17	1.87
RECREATION	6.94		-	2.04
COOPERATION	4.90			-

$p > .05$

Consistent across most subjects is the fact that at the termination of the thirty-minute probe, condition C is maintaining all responses at a higher level than the other two conditions. Condition B maintains responding at the next highest level followed by condition A. There also appears to be a trend for recreational responses to be maintained at a higher level than either of the other two responses.

FIGURE 7

Number of Intervals of Treated Social Response as a Function of Three Treatment Conditions for Subject D. A.

(Each trial represents responding for one five-minute observation period.)

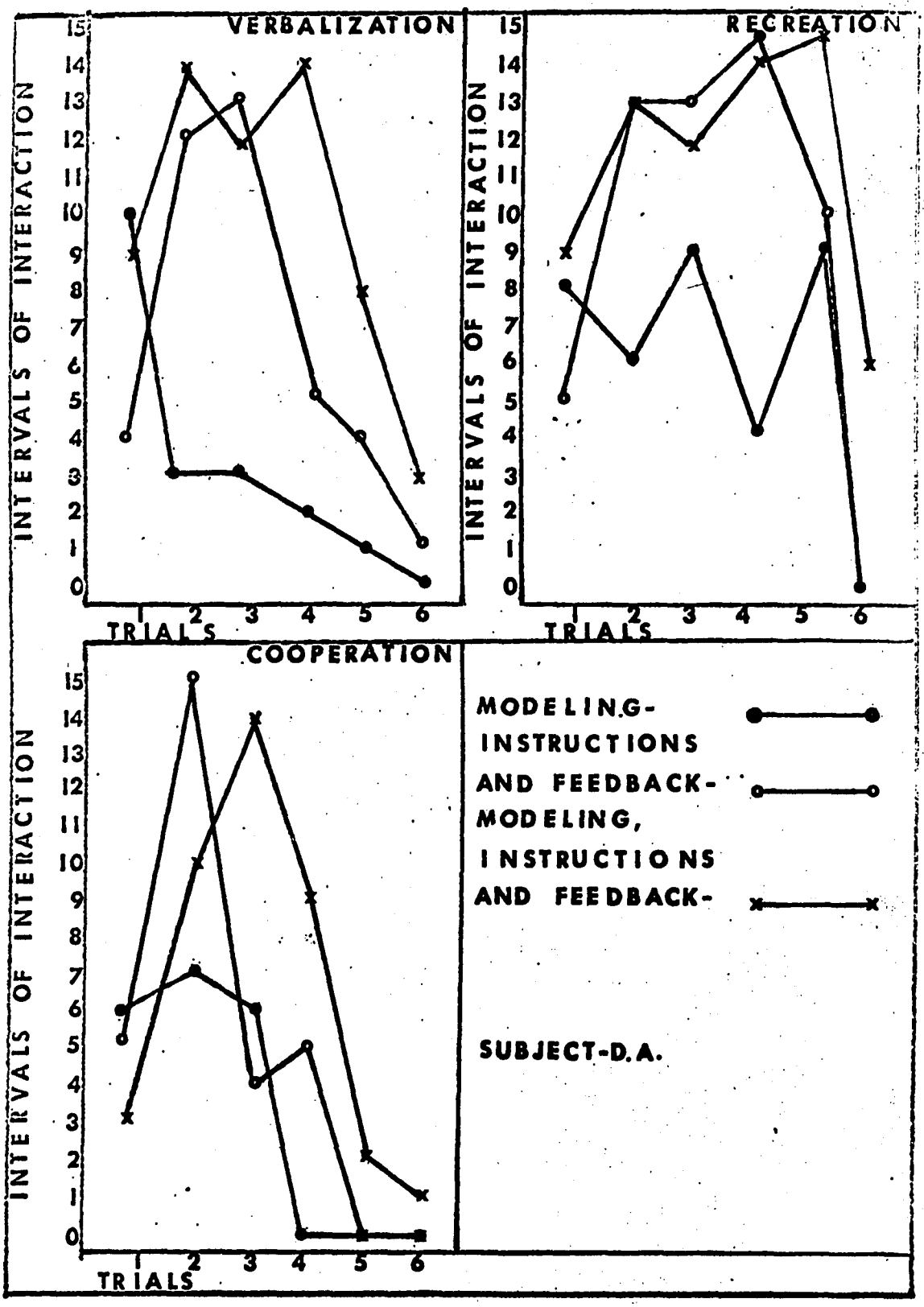

VERBALIZATION
RECREATION
COOPERATION
INTERVALS OF INTERACTION
TRIALS
MODELING-
INSTRUCTIONS
AND FEEDBACK-
MODELING,
INSTRUCTIONS
AND FEEDBACK-
SUBJECT-D.A.

FIGURE 8

Number of Intervals of Treated Social Response as a Function of Three Treatment Conditions for Subject J. H.

(Each trial represents responding for one five-minute observation period.)

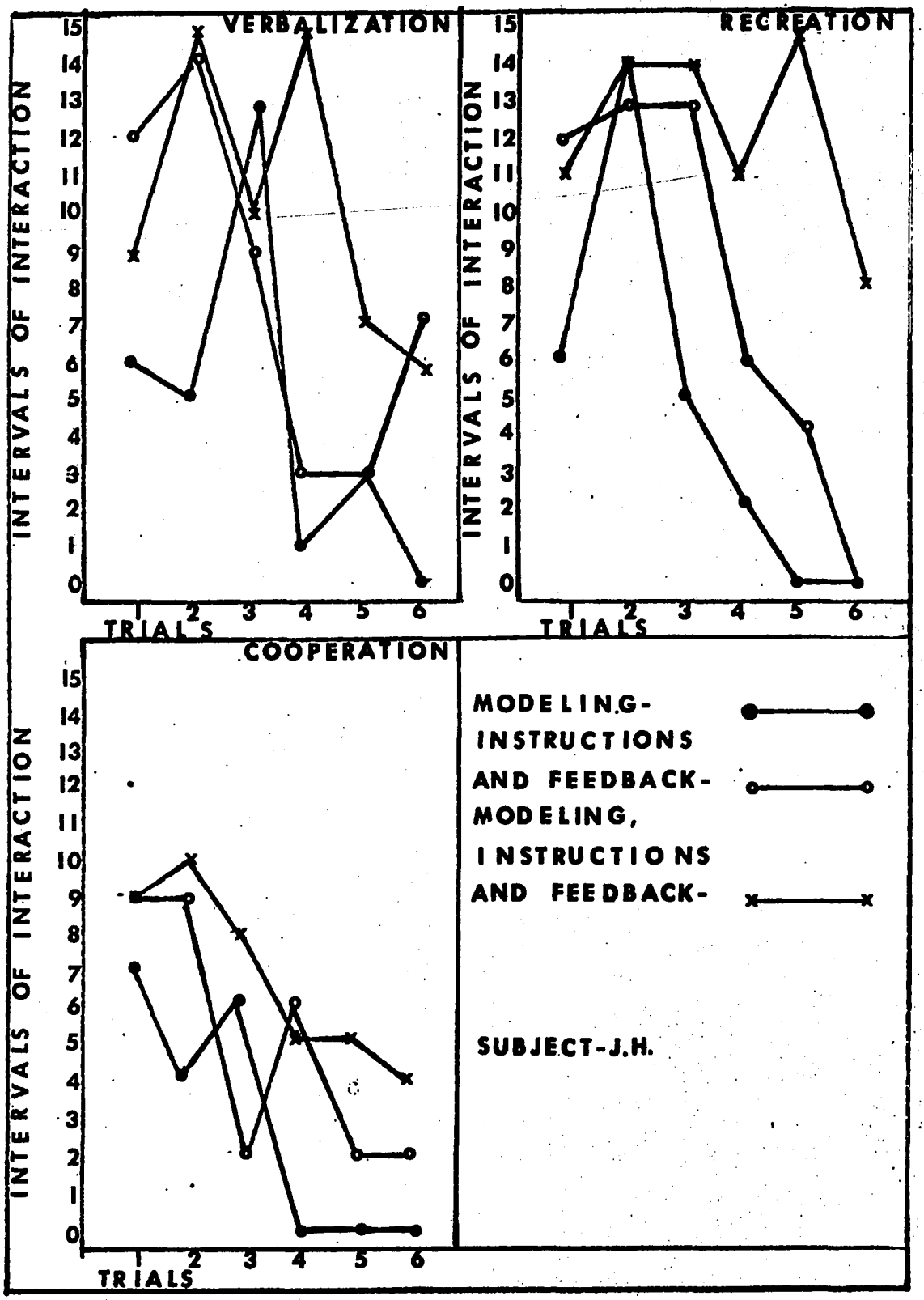
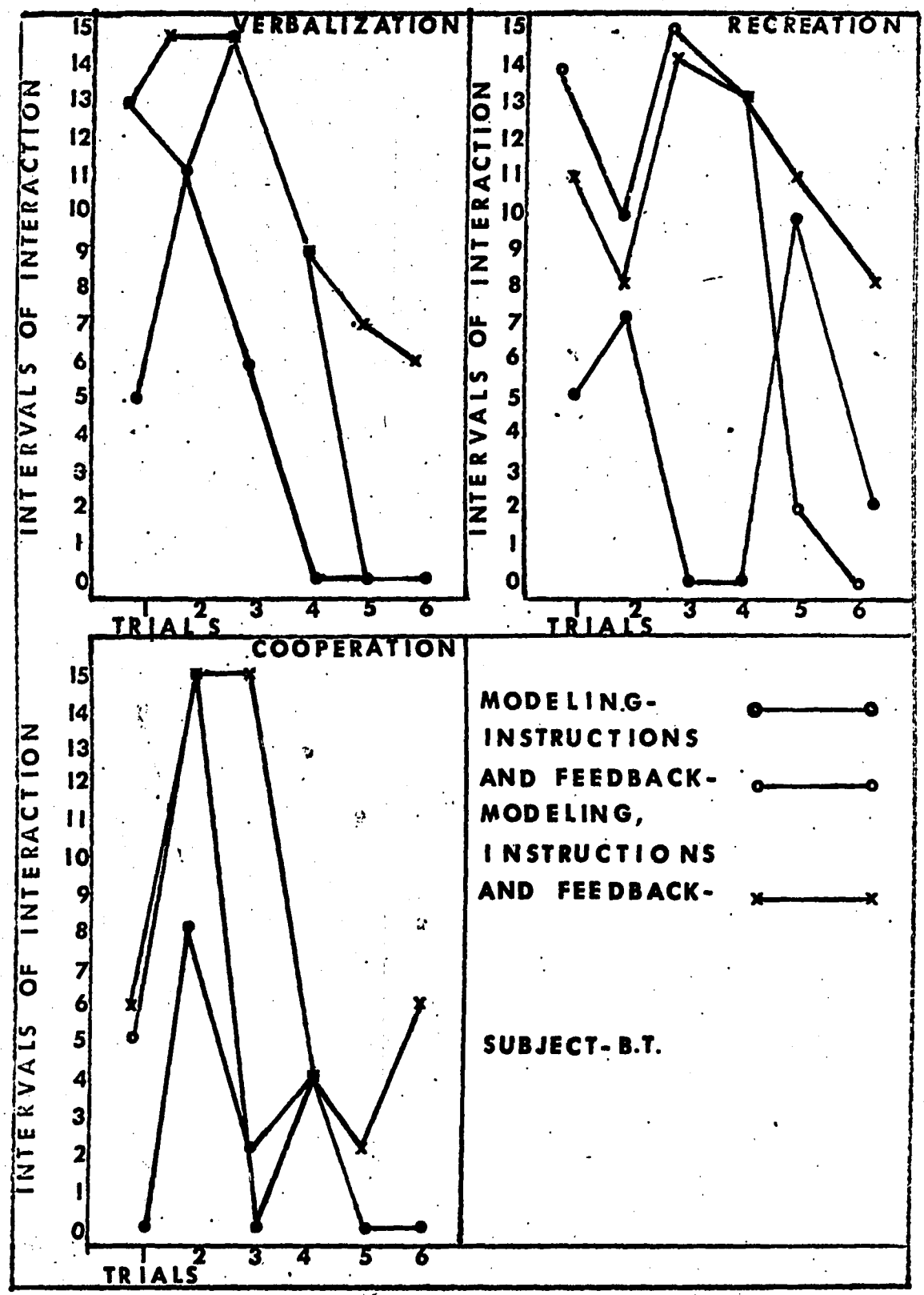

VERBALIZATION
RECREATION
COOPERATION
INTERVALS OF INTERACTION
TRIALS
MODELING-
INSTRUCTIONS
AND FEEDBACK-
MODELING,
INSTRUCTIONS
AND FEEDBACK-
SUBJECT-J.H.

FIGURE 9

Number of Intervals of Treated Social Response as a Function of Three Treatment Conditions for Subject B. T.

(Each trial represents responding for one five-minute observation period.)


VERBALIZATION
RECREATION
COOPERATION
INTERVALS OF INTERACTION
TRIALS
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
MODELING-
INSTRUCTIONS
AND FEEDBACK-
MODELING,
INSTRUCTIONS
AND FEEDBACK-
SUBJECT- B.T.

CHAPTER IV

DISCUSSION

Previous research has demonstrated the effectiveness of various behavioral procedures in altering modes of responding. Modeling procedures in particular have been shown in a number of instances to be potent in their ability to modify a variety of behaviors (Rosenthal, Zimmerman, & Durning, 1970; Hicks, 1965; Bandura, 1965). Feedback procedures often including instructions have also been found effective in the modification of various behaviors (Hopkins, 1969; Ayllon & Azrin, 1964; Whitman, Zakaras, & Chardos, 1971). One of the main research questions explored in this investigation was how these procedures, separately and in combination, affect behavior. The second major question explored in this investigation was how the three social responses were differentially affected by the various treatment conditions.

Training Conditions

Modeling

This investigation revealed that modeling on video tape in conjunction with intrinsic feedback was effective in increasing complex social responding. Verbal, recreational

and cooperative interaction responses were each increased over previous baseline levels as a function of this condition. These results are not surprising in light of the relatively frequent success rate of various modeling procedures (Rosenthal et al., 1970; Berkowitz, 1968; Bandura, 1965). The data of the present investigation show that all three complex interaction responses were modifiable using this condition. These data also show the effectiveness of the use of video tape modeling procedures for training social responses in mildly retarded adults.

Instructions and Feedback

The instructions and feedback condition presented singly was also successful in producing complex social responding. Once again, each of the three responses trained using this condition rose significantly over previous baseline frequencies.

Although instructions have been traditionally the least used of the various response elicitation techniques with retarded individuals, several psychologists view instructional stimuli as critical to the proper functioning of various feedback procedures. Baer and Wolf (1967) indicate that complex responses are amenable to instructional control. Bandura (1968), in supporting this view, states that "some devoted partisans of the operant approach . . .

often rely exclusively upon reinforcement practices to develop response patterns that can be readily produced by the use of simple instructions . . ." (p. 240). The enduring effects of instructions, however, are short if they are not combined with an incentive component (O'Leary, 1968; Philips, 1968).

The results of the combination of feedback and instructions used in this investigation lend support for Bandura's view. These data also support the inclusion of interaction responses with retarded persons in the increasing repertoire of responses that can be altered through the components of instructions and feedback (Whitman et al., 1971; Hopkins, 1968; Ayllon et al., 1964).

Modeling, Instructions plus Feedback

The combination condition of modeling, instructions plus feedback produced overall changes in each of the three interaction responses. Compared with baseline levels of responding, there was a significant increase in verbal, recreational and cooperation interactions as a function of this treatment condition. Previous research utilizing similar combination procedures reports results consistent with those found here. Lovaas (1967) found similar component combinations effective in increasing the verbal behavior of autistic children. Baer, Peterson and Sherman (1967) developed similar speech patterns in retarded children using

such procedures. The results extend the use of combination procedures to include the three social interaction responses modified here.

Comparison of the Training Conditions

The modeling and instructions plus feedback condition showed the greatest overall change in each response when compared with either the modeling condition or the instructions plus feedback condition. The instruction plus feedback condition was second in terms of the most significant overall change produced in the interaction responses. Modeling was last when compared to the other two conditions in spite of the fact that the modeling condition produced significant increases in each of the responses.

The degree to which the results of these conditions differed from each other may be compared with the findings of several other investigations. Whalen (1969) studied multiple conditions of modeling on film and instructions in the modification of college students' verbal behavior. She found no differences between the procedures when they were used singly. That is, the instruction procedure produced no greater results than the modeling procedure. However, when the two conditions were combined, there was a marked increase in responding as compared with results of the conditions taken singly. These findings are quite consistent with the results of the current study.

A component combination procedure, more comparable with the present investigation, was implemented by O'Connor (1972). Procedural comparisons, in O'Connor's study, involved modeling and shaping conditions applied singly as well as in combination. As in a previous study (O'Connor, 1969) social isolates were selected as subjects. The subjects were found to interact significantly more with peers as a function of each of the three treatment conditions. The effectiveness of the modeling plus shaping condition was not found to be stronger than the modeling or shaping condition taken singly.

The treatment differences which were found in the present study are not consistent with the results reported by O'Connor. A speculative explanation for these discrepant findings may lie with the shaping procedures employed in the O'Connor study. O'Connor engaged four persons to act as trainers in the shaping condition, thus setting up the possibility for trainer specific responding. The introduction of novel trainers at different stages of training may have enhanced the overall effect of the condition. Perhaps a more plausible explanation for the lack of differences found between O'Connor's conditions may be that modeling cues were present in the shaping condition. That is, the trainers may have inadvertently modeled the desired behavior thus diminishing procedural difference. However, further research is necessary to answer these discrepancies.

Further speculation is necessary to explain the large differences which resulted between the three conditions in the present study. That is, since the three conditions differed procedurally, variance in their effects on the three responses trained was expected. Thus, the significant differences between the conditions may be attributed to the relative independence of these conditions in modifying the specific responses of verbal, recreational and cooperative peer interactions. This assertion gains some support from a study by McFall and Marston (1970). They report results on a procedural comparison similar to the instruction and feedback condition used here. They found that behavioral rehearsal alone was an effective condition in increasing assertive behavior. They then compared the behavioral rehearsal condition to a combination condition of rehearsal plus feedback. Although the differences found were not significant, they did report a trend favoring the combination condition. A later study by McFall and Lillesand (1971) demonstrated that a combination of modeling, rehearsal, feedback and coaching (instructions) produced a dramatic increase in assertive behavior, superior to any of the conditions alone. The effectiveness of the treatment conditions in the current study are thus supported by the results reported by McFall and his associates.

In summarizing the effects of the treatment conditions used in this study, each was found to be effective in significantly increasing three interaction responses over baseline levels. The modeling condition consisted of an antecedent or attentional component as well as a consequent component which consisted of the model's feedback. In the instructions and feedback condition, instructions were implemented as a response elicitation or antecedent component while feedback served as the incentive or consequent component. Even though the conditions of modeling and instructions plus feedback were quite different procedurally, the component breakdown above shows them to be similar in organization. Several investigators have demonstrated the strength of including in a procedural structure both an antecedent component and a consequent component (Bandura, 1968; Ayllon & Azrin, 1964; Hopkins, 1968). The results of the modeling condition and the instruction plus feedback condition support such a component structure.

The modeling and instruction plus feedback condition was a combination of the antecedent and consequent components of the modeling condition and the instruction plus feedback condition. The combination condition made use of both the visual antecedent stimuli of the modeling condition and the auditory antecedent stimuli of the instruction plus feedback condition. The intrinsic and

extrinsic consequation stimuli of the modeling condition and instruction plus feedback condition, respectively, were also utilized together in the combination condition.

Theoretically, then, it would seem likely that a combination of the components making up the modeling condition, and the instruction plus feedback condition would produce a very powerful procedure. The results of the combination of modeling and instructions plus feedback did demonstrate this condition's strength in altering the three interaction responses under investigation.

Response Conditions

Trained Responses

The response classes selected as targets for training were: 1) non-specific verbal interactions--verbalizations; 2) activity specific peer interaction--recreation; 3) cooperation specific peer interaction--cooperation. The selection of these responses was based on an analysis of differential responding within a token program operative in the subjects' cottage. The analysis yielded results which showed that within the token program, the subjects were maximizing the earning potential of all activities not involving peer interaction. The three response classes selected were reinforceable responses within the token program. The occurrence of these responses was at an extremely low frequency.

As indicated earlier, training was initiated using each of the three treatment conditions with each of the three response classes. The pairing of each treatment and each response was counterbalanced to negate any possible order effect.

The results of the major analysis of variance were as dramatic for the response conditions as they were for the treatment conditions. Concurrent with treatment changes discussed earlier, all responses, regardless of which treatment condition was imposed, increased significantly from baseline levels. As was the case with the treatment conditions, a statistically significant hierarchy of responding established itself. That is, regardless of which treatment condition was being implemented, recreational responses occurred during significantly more intervals than did either of the other two responses. Non-specific verbal interactions or verbalizations was the response class occurring with the second highest frequency, significantly more than the number of intervals in which cooperative responses occurred.

During baseline periods, these responses did not differ significantly. The increase of each response condition over baseline responding as a function of the treatment conditions was highly significant. The comparison between responses within the probe periods shows significant differences between each response trained. This significant

pattern was also consistent when compared at each treatment level.

Several investigations have shown significant changes in positive social responses as a function of modeling and feedback procedures (Kale, Kaye, Whelan & Hopkins, 1968; Fechter, 1971; Hopkins, 1968; Zimmerman & Pike, 1972; Bandura & Harris, 1967; O'Connor, 1969, 1972). Behavioral increases have been found in various attempts to modify smiling responses, greeting responses, verbal responses, and peer interaction responses using a modeling and feedback procedure. Peer interaction has also been an alterable response as a function of various behavioral procedures. O'Connor (1969, 1972) has reported increases in group interaction behavior using a combination of modeling and shaping procedures with social isolates. He implemented a modeling film depicting eleven scenes of increasingly larger numbers of children engaged in recreational activities. The subjects received approximately five hours' worth of modeling and reinforcement time over a period of two weeks. At the termination of that period significant increase in appropriate social behavior was reported. In the present study, recreational responding was only one of three target behaviors. Introducing the three subjects to a modeling film of recreational behavior along with instructions and feedback produced dramatic changes in the occurrence of that response.

Although it is not known whether verbal and cooperative social responses changed as a function of O'Connor's procedure, these or other social behaviors may have increased when the isolates were exposed to the recreational behavior of other children.

Collateral Responses

In addition to the significant changes in the treated responses as noted earlier, collateral changes also occurred for non-target responses. That is, when verbal responding was being trained, recreational and cooperative responses were untrained. During the probe following verbal training, all three responses were measured. The results indicate a significant departure from baseline responding in both the trained response, verbalizations, and the untrained response, recreation. Cooperative behavior remained unchanged. When recreational responding was trained there was then a concurrent rise in verbal responding. When cooperative behavior was trained, recreational responses remained unchanged; however verbal behavior increased significantly along with the trained response. Additionally, it was found that with only untreated recreational responses did the choice of treated response matter. Verbalizations when treated produced more untreated recreational responses than did training on cooperative responses. For untreated cooperative and verbal responses,

the choice of treated response did not matter. That is, there were equal changes in these untreated responses as a function of training on verbal responses or recreational responses, and recreational responses or cooperative responses, respectively.

Several studies have found similar collateral changes in various academic and social responses. Kirby and Shields (1972) hypothesized that by increasing specific academic skills, collateral increases in attending behaviors should follow. The results showed that a praise and correctness feedback procedure was effective in producing increases in a junior high school student's arithmetic skills. As suspected, the percentage of time spent in attending behaviors was found to increase collaterally. A study by Ferritor, Buckholdt, Hamblin and Smith (1972) found that collateral increases in arithmetic skills did not occur as a function of training on attending behavior. The discrepancies found between the Kirby and Ferritor studies may be partly a function of the response chosen for modification in the latter investigation. Response selection was found to be an important variable in a study conducted by Buell, Stoddard, Harris and Baer (1968). They found that the reinforcement of the outdoor play of an isolate nursery school child had far-reaching effects on collateral social development. The problem behavior in this case was a lack of both gross motor play and interaction

skills. Gross motor play was chosen as the target response, specifically the child's use of outdoor play equipment. This response was selected because its occurrence would also increase social contact with other children since it would bring the child into closer physical proximity to the other children. The expectations of the investigators were confirmed and a wide variety of collateral social skills developed along with the increased use of outdoor play equipment.

Although a theoretical and empirically tested rationale is lacking at this stage in the research, the studies by Kirby et al. (1972), Ferritor et al. (1972), and Beull et al. (1968), have provided a picture of what other behavior changes may occur in the course of behavior modification aimed at a single response class. Beull (1968) states that his study shows "the kind of behavior changes which may accompany such behavior modification, especially if the behavior chosen for direct modification is a sound tactical choice, in view of the child's total range of behavior deficit" (p. 172). Several factors are implicit in the selection of a response which Beull terms "a sound tactical choice." The rationale for a tactically sound target response selection may include: the compatibility of the selected response and closely associated collateral responses; the physical proximity of the selected response to associated collateral responses; and the

position of the selected response and other responses in a chain of responses. These as well as other unanticipated variables may have been responsible for the collateral findings in the present investigation.

In review, when verbal responses were trained, there was a collateral increase in recreational responses. No collateral increase, however, was found in cooperative responding. Training on recreational responses led to a collateral increase in verbal responses but not in cooperative responses. Finally, training on cooperative responses resulted in a concurrent increase in verbal responses but not in recreational ones.

It is speculated that the responses trained in this investigation were inadvertently sound tactical choices for the collateral response changes that occurred. Following Beull's (1968) argument, there was a high probability that talking and playing would occur together. That is, they are compatible responses which could be chained together. The same rationale may be true for talking and working responses. However, playing and working would have a low probability of occurring together if the same rationale is followed. They would not normally be compatible responses nor would they follow each other closely in a response chain given that the controlling stimuli remain constant. Consequently, it is conjectured that each of the collateral

responses found here occurred on the basis of response compatibility and/or response chaining.

Inappropriate Responses

Another aspect of the response analysis concerns the increased occurrence of inappropriate responses as a function of the treatment and response conditions. This increase did not prove significant in the planned comparisons performed; therefore its occurrence seems to have been relatively indiscriminate. This non-specific occurrence of inappropriate responding could have been due to the unrefined social repertoires of the retarded subjects. Even though positive social interactions were trained by the three conditions, the other residents may have prompted some inappropriate responses in the natural environment. Consequently, out of the high frequency of social responses emitted, a small portion of these were inappropriate.

Summary

The data permitted an evaluation of the three treatment conditions and their effects on three appropriate social responses of retarded adults. It was found that each of the conditions of modeling, instructions plus feedback, and modeling and instructions plus feedback was effective in producing significant changes in the three social responses. These results were shown to be consistent with previous research. Statistical tests were also

performed comparing the relative efficacy of the three conditions. The combination of modeling and instructions plus feedback was found to be the strongest condition when compared with modeling or instructions plus feedback applied singly. Instructions plus feedback proved to be the next most powerful technique. Modeling was consequently found to be the weakest of the three training conditions. These conditions' relative effectiveness in training the responses in this investigation was found to be inconsistent with some previous studies. It was postulated that the conditions in this investigation contrasted procedurally which therefore increased the probability of differential results.

Each of the three social responses were found to increase significantly over baseline levels. Comparisons between responses showed that recreational responding increased more than either verbal or cooperative responses. Verbalizations showed the next largest increase, significantly different from the frequency of cooperative responding. Interactions across response classes were accounted for on the basis of the untrained responses being either trapped into or excluded from the reinforcing natural environment. Inappropriate responses were not found to increase significantly as a function of the treatment conditions.

The implications for future research seem clear. Further research is necessary to determine how the three

training conditions employed here compare in effectiveness not only with retarded subjects but also with other disabled and normal subjects, and not only with these social responses but with others as well.

The component combination condition also warrants a research strategy that will systematically dismantle the procedure. Any associated decrements in responding can then be measured. Thus, the relative contribution of each component to the total procedural package can be assessed.

Finally, the collateral response changes found in this investigation deserve more consideration in future research. The tactical choice of which response to train as well as the environment in which such responses are trained are two variables which influence collateral responses and which merit future attention.

CHAPTER V

SUMMARY

Both modeling and feedback procedures have been found to be effective in the modification of a wide variety of behaviors. Comparisons of these procedures applied either singly or in combination have been few and the results of these studies have been inconsistent.

This investigation compared the relative efficacy of modeling and feedback procedures applied singly and in combination. Specifically, a modeling on video tape procedure and an instructions plus feedback procedure were compared. A combination procedure consisting of both modeling on video tape and instructions plus feedback was also compared to the procedures used separately. Comparisons were made of the effectiveness of these conditions in increasing the appropriate peer interaction of three retarded adults. Social interactions consisted of verbal, recreational, and cooperative responses.

A counterbalanced, multiple baseline, experimental design was utilized. This design enabled treatment comparisons to be made within each subject's performance on the three responses. The design also allowed for comparisons of collateral changes accompanying training on each of the three responses.

An evaluation of the effectiveness of each of the three training conditions revealed that each of the conditions was effective in significantly increasing each response over baseline levels. A comparison of the relative effectiveness of the three conditions found that the combination of modeling and instructions plus feedback was the strongest condition when compared with either the modeling condition or the instructions plus feedback condition applied singly.

Instructions plus feedback proved to be the second most powerful technique. Modeling was consequently found to be the weakest of the three training conditions.

Each of the three social responses was increased significantly over baseline levels. Comparisons among responses showed that recreational responding increased more than either verbal or cooperative responses. Verbalizations showed the second largest increase and were significantly greater than the frequency of cooperative responding. The interactions of trained responses with untrained responses were accounted for on the basis of the untrained responses being either trapped into or excluded from the reinforcing natural environment. Inappropriate responses were not found to significantly increase as a function of the training conditions.

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APPENDIX A

Observation Sheet

NAME OF OBSERVER _____
RELIABILITY _____
DATE _____
TIME _____ IN _____ OUT _____
CONDITION _____
RESPONSE _____
SUBJECT _____

SUMMARY TABLE

RESPONSE	INTERVALS OF RESPONSE/TOTAL INTERVALS	RELIAB.	DECIMAL	%

OBSERVATION SESSIONS	OBSERVATION RESPONSE INTERVALS					
	A B C I O	A B C I O	A B C I O	A B C I O	A B C I O	A B C I O
1	A B C I O	A B C I O	A B C I O	A B C I O	A B C I O	A B C I O
	A B C I O	A B C I O	A B C I O	A B C I O	A B C I O	A B C I O
	A B C I O	A B C I O	A B C I O	A B C I O	A B C I O	A B C I O
2	A B C I O	A B C I O	A B C I O	A B C I O	A B C I O	A B C I O
	A B C I O	A B C I O	A B C I O	A B C I O	A B C I O	A B C I O
	A B C I O	A B C I O	A B C I O	A B C I O	A B C I O	A B C I O
	A B C I O	A B C I O	A B C I O	A B C I O	A B C I O	A B C I O
3	A B C I O	A B C I O	A B C I O	A B C I O	A B C I O	A B C I O
	A B C I O	A B C I O	A B C I O	A B C I O	A B C I O	A B C I O
	A B C I O	A B C I O	A B C I O	A B C I O	A B C I O	A B C I O
	A B C I O	A B C I O	A B C I O	A B C I O	A B C I O	A B C I O
4	A B C I O	A B C I O	A B C I O	A B C I O	A B C I O	A B C I O
	A B C I O	A B C I O	A B C I O	A B C I O	A B C I O	A B C I O
	A B C I O	A B C I O	A B C I O	A B C I O	A B C I O	A B C I O
	A B C I O	A B C I O	A B C I O	A B C I O	A B C I O	A B C I O
5	A B C I O	A B C I O	A B C I O	A B C I O	A B C I O	A B C I O
	A B C I O	A B C I O	A B C I O	A B C I O	A B C I O	A B C I O
	A B C I O	A B C I O	A B C I O	A B C I O	A B C I O	A B C I O
	A B C I O	A B C I O	A B C I O	A B C I O	A B C I O	A B C I O
6	A B C I O	A B C I O	A B C I O	A B C I O	A B C I O	A B C I O
	A B C I O	A B C I O	A B C I O	A B C I O	A B C I O	A B C I O

APPENDIX B

Raw Data--Appropriate Social Interaction Responses

A_1--Modeling on Video Tape

A_2--Instructions and Feedback

A_3--Modeling on Video Tape, Instructions and Feedback

B_1--Non-specific Verbal Interaction

B_2--Activity Specific Verbal Interaction

B_3--Cooperation Specific Interaction

C_1--Baseline Period

C_2--Probe Period

	A_1			A_2			A_3		
	B_1	B_2	B_3	B_1	B_2	B_3	B_1	B_2	B_3
	C_1 C_2	C_1 C_2	C_1 C_2	C_1 C_2	C_1 C_2	C_1 C_2	C_1 C_2	C_1 C_2	C_1 C_2
Subject A	6 19	2 36	2 19	4 39	1 56	0 29	5 60	1 69	0 39
Subject B	2 28	0 27	0 17	2 48	2 48	2 30	3.62	2 73	3 41
Subject C	4 22	3 24	0 14	4 48	3 55	3 24	5 65	2 65	3 48

APPENDIX C

Raw Data--Inappropriate Social Interaction Response

A_1--Modeling on Video Tape

A_2--Instructions and Feedback

A_3--Modeling on Video Tape, Instructions and Feedback

B_1--Non-specific Verbal Interaction

B_2--Activity Specific Verbal Interaction

B_3--Cooperation Specific Interaction

C_1--Baseline Period

C_2--Probe Period

	A_1						A_2						A_3					
	B_1		B_2		B_3		B_1		B_2		B_3		B_1		B_2		B_3	
	C_1	C_2	C_1	C_2	C_1	C_2	C_1	C_2	C_1	C_2	C_1	C_2	C_1	C_2	C_1	C_2	C_1	C_2
Subject A	4	6	9	5	5	4	9	8	11	7	1	6	3	12	10	10	12	4
Subject B	13	8	5	5	4	2	8	4	7	5	23	5	6	12	8	6	6	9
Subject C	8	7	6	7	6	6	4	4	6	8	2	4	5	1	4	4	8	2