The Effects of Self-Recording on the Generality of Parenting Behaviors

Sonia Beatriz Meyer
Western Michigan University

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THE EFFECTS OF SELF-RECORDING ON THE GENERALITY OF PARENTING BEHAVIORS

by

Sonia Beatriz Meyer

A Thesis
Submitted to the
Faculty of The Graduate College
in partial fulfillment of the
requirements for the
Degree of Master of Arts
Department of Psychology

Western Michigan University
Kalamazoo, Michigan
April 1982
THE EFFECTS OF SELF-RECORDING ON THE
GENERALITY OF PARENTING BEHAVIORS

Sonia Beatriz Meyer, M.A.
Western Michigan University, 1982

The objective of this study was to determine the effects of parental self-recording from audiotapes of family interactions on effective parenting skills and on the generality of their application to three different times of the day in which different child behaviors occurred.

Two single parents were instructed to deliver correct commands and differential reinforcement and to code and graph their verbalizations from audiotapes. Self-recording was introduced in one situation at a time, while audiotaped assessments were made by the parent in all three situations throughout the day. Both positive and cost incentive systems were used for the delivery of tapes and codings but not for behavioral change.

Parent and child behaviors changed in desirable directions after the procedure was introduced. Generality effects were clear in all response categories except descriptive praise. As the number of codings increased, greater parent behavior changes were seen on the targeted and non-targeted situations.
ACKNOWLEDGEMENTS

My stay at Western Michigan University was a valuable experience both academically and in terms of the friendship offered. I want to thank my thesis committee for that. Cheryl Poche, my advisor, spent many hours reviewing, criticizing and editing earlier drafts of this paper so that I could finish on time to go back to my country, Brazil. I want to thank her also for her continuous assistance. Joetta Long encouraged me in my interest in the area of parent training, and offered help and suggestions that made this research possible. I am very satisfied to have had Jack Michael on my committee and as my teacher. Through his classes and suggestions, I hope I became a better professional. I am very grateful to Randy Poole, Brad Harper, Olinda Sandoval, Eileen Burton, Deborah Mazur, and Juan Herakovic for helping me obtain reliability measures during the pilot and present studies. I want to thank the Child Development Center Staff for offering the free child care for the incentive system. Thanks is also extended to Patti Cherpas for helping me in the writing of this paper, and to all my friends and relatives that in various ways assisted me during my stay here.

Sonia Beatrix Meyer
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CHAPTER I
INTRODUCTION

The objective of the present study was to determine whether parental self-recording from audio-tapings made by them in the home was an effective way of producing behavior change. Furthermore, the study sought to determine if self-recording would produce generality of parent behaviors to different times of the day in which different child behaviors occurred.

As a technique for producing behavior change, self-recording has been reported to be successful with a variety of subjects and problems. As a method of assessment, tape-recordings of family interactions have been used, and the advantages of recording have been reported. Generality of parent training results has been investigated and its desirability pointed out by several authors. However, a combination of self-recording from audio-tapes to produce generality of parent training results has not been analyzed to date.

Several assessment techniques have been used to evaluate parent training programs. They include verbal reports of parents, relatives, and friends through interviews, telephone contacts, and questionnaires, as well as personality tests and role-plays. Parent-collected observational data, structured laboratory observations, and direct observations in the home have also been frequently utilized (Berkovitz & Graziano, 1972; Eyberg & Johnson, 1974; Forehand & Atkeson, 1977; O'Dell, 1974; Peed, 1977; Roberts & Forehand, 1978; Wahler, 1969,
Studies by Eyberg and Johnson (1974) and Peed (1977) suggest that these different assessment methods produced different conclusions. Forehand and Atkeson (1977) concluded in their review of parent training assessment procedures that the more rigorous the method of assessment, the less positive the results have been, and that parents' verbal or written opinions have questionable validity. The more rigorous methods involve the direct assessment of overt behavior.

Direct home observations present some disadvantages, however. They are costly and time-consuming mainly when a large number of observations are required, as reported in several studies. Miller and Sloane (1976), for instance, reported using 45-minute observations, five days a week, for three months. Herbert and Baer (1972) reported one-hour observations, five days a week, over a six-month period. Kelley et al. (1979) reported 30-minute observations, four days a week, for 14 weeks. Time of transportation and some conversation with the family had to be added for each home visit. Even these high-frequency assessments did not obtain a broad sample of behaviors, since they were done at the same time every day, and had to be necessarily conducted at a convenient time for the family, primary observer and reliability observer. The hour before dinner was a common observation time. Observation sessions several times a day have not been conducted frequently.

Probably because of the costs, time involvement, and inconvenience for the family, direct observations have often been brief in duration and limited to one pre- and one post-observation (Forehand
& Atkeson, 1977). However, in order to demonstrate the process of behavior change, a continued measure of the behavior over time is preferrable to pre- and post-observations, especially when the behavior is variable. Also, the larger the number of observations, the more representative are the data.

Home observations may have been inconvenient for families in that several rules had to be followed. Long (1978), for instance, listed six rules: a) the entire family had to be present; b) no visitors should be present; c) the family had to be engaged in some type of interaction, preferably such that the target behaviors could be observed; d) no television, radio, telephone conversations, or interruptions should occur; e) no verbal interactions should occur between family members and observer during the observation period; and f) the family was asked to ignore the presence of the observer and interact "normally". Home observations could also have been problematic for the family because of the commitment of always having to be in the home at a certain time over a period of several months.

A major problem with home observations is that they are obtrusive, that is, subjects are aware that their behavior is being assessed. The potential problem with obtrusive assessment is that it may be reactive, that is, affect how subjects perform, in such a way that behaviors assessed under obtrusive and unobtrusive conditions have little correspondence (Kazdin, 1979). Studies on the extent of reactivity in naturalistic observations have provided contradictory evidence, some indicating minimal and others pronounced reactivity (Johnson & Bolstad, 1973). Forehand and Atkeson (1977) also concluded
that studies are needed on the reactivity of an observer's presence.

Reactivity was demonstrated when parents manipulated their children's behavior in home observations. Children's deviant behaviors, parental negative responding, and parental commands were higher when parents were instructed to make their child look "bad" or "deviant" than when they were asked to make them look "good" or "nondeviant" (Johnson & Lobitz, 1974).

Many factors seem to contribute to the extent of reactivity. Four sources were cited by Johnson and Bolstad (1973): a) the conspicuousness and novelty of the observer; b) individual differences of the subjects; c) personal attributes of the observer; and d) rationale for observation. According to Kazdin (1979), subject behavior can be affected in varying degrees by the assessment procedure. If subjects are informed that the results of assessment will be used to determine the reinforcers that they can earn, assessment may be much more reactive than if subjects are told that results have absolutely no bearing upon their performance. The factors that seem to contribute to decreased reactivity are observations across many stimulus settings and progressive adaptation to being observed, although other processes could account for such changes (Johnson & Bolstad, 1973; Johnson & Lobitz, 1974; Hughes & Haynes, 1978).

Audio recording in the home was considered an alternative method for data collection which has several advantages over direct observation. Johnson and Bolstad (1975) pointed out that audio-recording attenuates the problem of observer bias by limiting subject-observer contact. It allows for completely random checks of observer agreement,
eliminating inflated observer agreement estimates produced by observers who are aware of periodic agreement checks. It appears to provide greater convenience to all involved and is less costly than direct observation. Johnson and Bolstad (1973) also indicated that recording devices could remain in the homes over an extended observation period to facilitate habituation effects. They could be preprogrammed to turn on and off at different times during the day so the persons observed would not know when they were in operation. As Hughes and Haynes (1978) pointed out, video or audio recordings can be carefully reviewed and stored for later interobserver agreement checks; they are available for later analysis of different variables; and time-samples can be superimposed to demarcate observation intervals.

Nordquist (1971) demonstrated that videotaped records, made by the use of a wireless microphone, of both normal and impaired speech produce reliable records even when the subjects exhibit nonverbal techniques.

Furthermore, audio recording places fewer restraints on the family than direct observation. The family does not need to remain in only one or two rooms; they can move to different places by either carry-a portable tape recorder, placing microphones in several places in the home, or having the child (or adult) wear a wireless radio transmitter. Parents need not induce the occurrence of children's target behaviors, since the tape-recording can take place at the time when the problem generally occurs. No verbal interactions with the observer need occur during the observation period, and no transportation and interaction time is needed. Tape-recordings can be done at any time of
the day, and with a high frequency, since this does not depend on observer availability. Observers have fewer restraints too, since they can listen to the tape at their convenience. Their time schedule does not need to match that of the reliability observer. Follow-up measures can be done less obtrusively by asking the parent to make a tape-recording once a month, for instance.

Comparisons between audiotape recordings with an observer present or absent were conducted by Bernal et al. (1971), by Johnson and Bolstad (1975) and by Gang and Poche (1980). Gang and Poche reported that no differences were found between the tutoring behaviors of three parents with the experimenter present and their performance with only the cassette recorder present. They concluded that both situations were reactive since the presence of the tape recorder and the knowledge that the tapes would be monitored could serve to motivate the parents to perform the tutoring behaviors exactly as instructed. No differences were reported by Johnson and Bolstad either between the conditions of observer present or absent. They concluded that no differential reactivity existed between these observational procedures, although the counterbalancing procedures that required observer presence on alternate days may have enhanced the reactive effects on observer-absent days. Bernal et al. concluded that during the same time interval, there was a high relationship between the mother's command rate as coded by the observer from the tape but that the observer coded more commands. Similar results were obtained when the observer's data were compared with data based on coding of the audiotapes from different time intervals. The reason given for the
difference between command rates was that the observer could code gestural commands while the coder using the tape could not. Kent et al. (1979) compared observational recordings in vivo, via mirror, and via television, and found that the frequencies of children's behaviors differed significantly for only the verbalization category. This finding is in accordance with the previous ones that there are high correlations between data collected in different media.

Johnson, Christensen, and Bellamy (1976) evaluated family intervention through unobtrusive audio-recordings in the home during pre- and post-intervention assessments. The children wore a radio transmitter which broadcasted to a receiver-recording apparatus that was activated by an interval timer. The timer could be activated at predetermined "picked" times by the parents or at predetermined "random" times. "Picked" times were parent-selected situations during which problems typically occurred. The authors concluded that, during the pretest, child-deviant, parent-negative, and parent-commanding behaviors were significantly higher at "picked" times than at "random" times. At post-test behaviors in all three classes were substantially reduced at "picked" times but not at "random" times. However, a close examination of the data shows that in four out of the five cases studied, the reductions in the three classes of behavior were also significant at the "random" times. The percentage of change was smaller, but it might have been due to a basal effect, that is, the inappropriate behaviors were already occurring at a low rate. These results leave the question of reactivity of obtrusive tape-recording still unconcluded.
The amount and cost of equipment used in these studies have varied considerably. In Johnson, Christensen, and Bellamy's (1976) study, the audio equipment consisted of a transmitter, a receiver, a 24-hour timer, two 15-minute time switches, and two reel-to-reel tape recorders. The total cost was almost $800.00. Bernal et al. (1971) used a tape recorder, a timer, a microphone, and a suitcase. Horton (1975) used a small wireless FM microphone that broadcasted to a FM receiver connected to a reel-to-reel tape recorder. Nordquist (1971) also used a wireless microphone with children in a free-play preschool setting. However, a small cassette tape recorder with a built-in microphone is inexpensive and produces audible tape-recordings.

Few studies have reported a systematic evaluation of changes in parent behaviors following a parent training program. Typically, studies emphasized changes in deviant child behaviors as a result of training parents in behavior modification skills. While changes in child behavior are the ultimate criteria by which the effectiveness of any parent training program must be judged, it is important to identify and measure the changes in targeted parent behaviors which are assumed to modify child responding. Such evaluations provide data needed to design more effective and efficient procedures for training parents and to alter child behavior, as well as data that can indicate the conditions which influence behavioral generality (Peed et al., 1977; Forehand & Atkeson, 1977; O'Dell, 1974).

The most frequent category of parental behavior assessed has been the use of commands to get children to comply. Forehand (1977), Wahler (1969, 1976), Forehand et al. (1975), Peed et al. (1977), Kelley
et al. (1979) and Roberts et al. (1978) have all defined different sub-categories of instruction-giving, and all of them basically considered the instructions as correct or incorrect. Frequently, these authors also assessed the categories of attention given for appropriate children's behavior and for inappropriate children's behavior. Children's compliance was also assessed. However, assessment of compliance cannot be done reliably from audio recordings, since compliance refers frequently to a motor, non-vocal response.

Several studies have been conducted on the relationship between commands and compliance, indicating the need for training parents in the delivery of few and clear commands. Forehand et al. (1975) found that the interaction of non-compliant clinic children and their mothers can be differentiated from the interaction of non-clinic children and their mothers by the rate of compliance of the child and the mother's use of commands and criticisms. Delfini et al. (1976) found that parents of clinic-referred children issued more commands, and higher rates of "negative" commands, than parents of non-referred children. Peed et al. (1977) concluded that a high rate of incorrect commands to which the child does not have a reasonable opportunity to comply not only influences the measure of child compliance to total commands, but also may result in an escalating maladaptive parent-child interaction. That is, a high rate of incorrect commands may lead to parental perception of greater child non-compliance, which may lead to a higher rate of incorrect commands, and so on. Roberts et al. (1978) found that command training resulted in increased child compliance and that training in both commands and timeout obtained even greater
improvement in child compliance.

Effective parent training seems to require three steps. First, the parents must acquire the modification skills and changes in their own behavior. Second, changes must be implemented with the child. And, third, changes must show generality and durability. Only the implementation phase with the child has received sufficient attention (O'Dell, 1974). The generality phase is one in which success has not been frequent, that is, most of the programs that assessed generality failed to demonstrate its occurrence.

The issue of generality has been analyzed as the occurrence or non-occurrence of "generalization". But this is misleading usage of this term according to Johnston (1979), and the issue is one of generality and not of generalization. Stimulus generalization refers only to the fact that when responses are reinforced in the presence of one stimulus, they may also occur, although possibly with less frequency, to other similar but different stimuli. Response generalization adds that, with such a training history, similar but different responses may be evoked by the stimulus previously paired with reinforcement.

The term generalization is often erroneously used as a description and explanation of any appropriate change occurring in a non-training setting. This suggests that a single phenomenon is at work when actually a number of different phenomena need to be described, explained, and controlled. Consequently, we do not understand how behavior change happens in non-training settings and cannot engineer such changes successfully. The process of generalization is not strong.
enough to maintain or produce desired responding in the face of a different set of environmental stimuli. The issue is not so much how to get "generalization" but how to arrange control over different environmental conditions which result in desired influences on behavior. This is a question of generality for the behavior analyst and the behavior modifier. Generality then refers to universality or replicability.

When generality of treatment effects occurs, the therapist does not need to treat recurrences of previously treated problems (temporal generality), the problem behaviors in new settings (setting generality), all behavior problems of the child (behavioral generality), and repeated intervention is minimized, as future behavior problems of the child and his or her siblings are diminished (Forehand & Atkeson, 1977).

Behavioral generality and setting generality from home to school are areas in which the least compelling evidence is available. O'Dell et al. (1974) and Forehand and Atkeson (1977) stated in their parent training reviews that training did not generalize to nontargeted behaviors, that there were no well-developed techniques for producing generality, that changes in untreated child behaviors should be related to changes in parental response to the child's non-targeted behaviors, and that studies were needed in this area with rigorous methods of assessment (Patterson, 1974; Moore & Bailey, 1973; Zeilberger, Sampen & Sloane, 1968; Resick, Forehand & McWhorter, 1976).

Multiple baseline designs have been used to measure treatment generality, especially behavioral generality (O'Dell, 1974; Forehand &
Atkeson, 1977). In the multiple baseline design, different behaviors are measured simultaneously, but the procedure is introduced to one baseline at a time. Change in the behavior rate is then observed not only in the behavior to which the procedure was introduced, but in the other behaviors too, when generality occurs. However, one cannot conclude with certainty that generality occurred because the effects could easily be due to some outside variable. The generality effect destroys the utility of the multiple baseline design (Bailey & Bostow, 1977) but there is no other experimental design that demonstrates experimental control when generality is the goal of the treatment. As Forehand and Atkeson (1977) pointed out, the multiple baseline design leads to ambiguous results.

Data on occurrence of generality across settings, behaviors, or time suggest that in order to assure the generality's occurrence, development of techniques to provide the environmental events supportive of generality must be systematically programmed.

Useful methods of obtaining generality were presented by Stokes and Baer (1977), although they were designated as generalization methods. "Train and hope" was the first method presented where generality was assessed but not actively pursued. In the sequential modification method, if generality is absent or deficient, the procedure is sequentially applied to every nongeneralized condition. Generality can also be obtained by introducing natural maintaining contingencies, or by training sufficient exemplars. In this method, one exemplar or one dimension is trained at a time until generality can be observed in the other exemplars or dimensions. Training "loosely" using
indiscriminable contingencies, programming common stimuli, mediating generalization, and training "to generalize" were the other methods discussed.

Kelley, Embry and Baer (1979) programmed generality when they trained parents for maintenance. They taught both parents to engage in behaviors supportive of each other to enhance the generality of the child management skills across time within a family support system. Both parents learned to deliver appropriate instructions and differential attention to modify the child’s non-compliant and inappropriate behavior.

It is important to determine which procedures are effective to produce generality. Self-control procedures such as self-recording, taught as part of an intervention program, may function to promote generality. Such techniques are easy to transport and may be employed readily to facilitate responding under generality conditions. Some research that has employed any or all of the various tactics of self-assessment, self-recording, self-determination of reinforcement, and/or self-administration of reinforcement, has also displayed maintenance and generality of behavior change. However, the correlation is not perfect (Stokes & Baer, 1977).

Self-recording alone has been reported to produce behavior change. Kazdin (1974a) found that self-monitoring on a sentence-construction task was reactive, that is, the behavior being observed was changed. He reported that behaviors altered by self-monitoring included hallucinations, tics, repetitive self-scratching, nail-biting, disruptive student behavior, smoking, attention given by parents to appropriate
child behaviors, alcohol consumption, obesity, academic performance in college students, and student participation in class. However, the effects of self-observation on behavior have been inconsistent (Kazdin, 1974b; Rosenbaum et al., 1979). Sometimes the behavior in question was altered, but changes usually persisted for a short time only or did not change the behavior being observed.

Some factors that may influence the effects of self-monitoring include the establishment of a criterion for performing the target response, the comparison of the obtained data to a standard of performance, surveillance by an external agent, and instructions on how to perform the target behavior (Jones, Nelson & Kazdin, 1977; Kazdin, 1974a).

The change resulting from self-monitoring does not depend upon accurate or reliable recording on the part of the client (Kazdin, 1974a, 1974b; Rosenbaum & Drabman, 1979). The importance of the reliability of self-monitoring varies with the purpose for which self-monitoring is employed. When it is used as an assessment technique, reliability is very important. When it is used as a behavior change technique, the consistency and accuracy of measurement are less crucial and perhaps irrelevant (Kazdin, 1974b).

Some studies used self-recording as part of a technique to teach management skills to staff, teachers, and parents. Miller and Sloane (1976) gave a parent a wrist counter to keep track of the number of times she "requested" speech during snack. Self-recording was only one of the components of the procedure and no conclusions can be drawn on its effectiveness alone. Doleys et al. (1976) asked parents
to score their own behavior from an audiotape and observed significant behavioral changes that were maintained over a 30-week follow-up. Self-recording was also part of a package containing additional post-interaction feedback from experimenters and recording of other parent-child interactions, and it followed lectures and role-playing in effective child management. Although parents valued the self-recording, it is not clear if it alone was responsible for parental behavior change. It is not clear either if parental behavior changes occurred and were maintained at home, since the interactions were only recorded in the clinic. The authors suggest that self-recording of home tape-recorded interactions may engender generality and maintenance of behavioral changes.

Self-recording of ongoing behavior was studied by Herbert and Baer (1972), Miller and Sloane (1976), and Burg, Reid and Lattimore (1979). In the study by Herbert and Baer (1972), two mothers of deviant young children were instructed to count their episodes of attention to appropriate child behavior in their homes, using wrist counters. Maternal attention and appropriate child behavior increased and did not reverse with the removal of the wrist counters. Further improvements were obtained when self-recording was again introduced, and these improvements were maintained after five months, despite inaccurate parent self-recording. Self-recording had little effect on attention to inappropriate child behavior.

Burg et al. (1979) used self-recording and a supervision program to increase interactions between direct care staff and profoundly retarded persons in a state residential facility. The staff received
instructions regarding what to self-record, the criteria for how many interactions to record, and a prepared card on which to make the recordings. The rate of interactions increased noticeably, and small decreases were observed in resident self-stimulatory and disruptive/aggressive behaviors. Follow-up measures indicated that the rate of staff self-recording was variable, but when staff did self-record, the increased rate of staff-client interactions was maintained.

The technique of self-recording from audiotapes was used successfully by Doleys et al. (1976) and by Horton (1975). In the study by Horton (1975), two fourth grade teachers were initially trained to identify instances of behavior-specific praise on video-taped presentations and were given instructions to use praise. Then they were required to listen daily to audiotaped recordings of their classroom interactions while marking the number of instances of target behavior heard and graphing the number of instances. Baseline was collected in five subject matter areas. The procedure was introduced first in reading. It was later withdrawn and then reintroduced in reading, mathematics, and language arts. The rates of behavior-specific praise increased but this effect was restricted to subject matter areas in which training was conducted. During the withdrawal of the procedure the behavior-specific praise declined, but it did not revert to the near zero rate of baseline. In the second experimental period the mean rate of behavior was higher than in the first experimental period.

Self-recording from audiotapes at a later time than the actual recording presents a theoretical problem if the coding process is considered as a consequence that aims to change the behavior listened to.
The categorization of one's behavior as a correct command, descriptive praise, or attention for appropriate behaviors can probably function as reinforcement, and its categorization as an incorrect command or as attention for inappropriate behaviors can probably function as punishment. But how can the categorization affect the behavior if the consequence is contingent on the tape-recording? What probably occurs is that when people listen to their own behavior on a tape-recording, they covertly engage again in the same behavior. This is similar to the process that Skinner (1974) used to analyze memory or seeing something in the absence of the object seen. That is, when people recall or imagine something, they behave covertly as they behaved in the presence of the actual stimulus. The covert verbal behavior that is emitted when people listen to their tapings could be either self-echoic (Skinner, 1957), or it could be an actual emission of the same behavior at the covert level, since the controlling circumstances such as children’s verbalizations are partially presented again through the tape. The consequences would then act upon the actual behavior if the person is behaving along with listening to the tape.

The consequences of self-recording from a tape could be more effective than therapist's consequences or self-recording of ongoing behavior in the production of a behavior change that shows generality. This is because the stimulus control generated by other aspects of the situation when the tape-recording took place are absent when the tape is played at a later time. The absence of a strong situation-specific stimulus control could be the instrumental factor in the production of generality. Parents' correct responses could be
controlled by the relevant characteristics of child behavior, and the changed repertoire would be displayed at different times of the day when interacting with the children.

In the present study, parents were taught to deliver correct commands and to use differential reinforcement. Generality across situations was programmed by the use of the technique of self-recording in one situation at a time. Audio recordings were used as an assessment and behavior change tool.
CHAPTER II

METHOD

Subjects

Six families answered a letter of invitation sent to all parents of children attending the day care center sponsored by Western Michigan University's Psychology Department. Initial interviews were conducted with four of those families. Three of them decided not to participate in the program because they would not have the time to do the home assignments. The two other families were contacted by telephone, but the initial interview was not conducted because of health and work problems. The second family that participated in this study was referred by a personal source.

Family A was a 24-year-old, divorced, high school graduate and mother of a 3-year-old daughter. The mother was a welfare recipient who was not working during the time of the study, except for babysitting other children at her house, but she was looking for employment. Family B was also a divorced woman living on welfare, a 27-year-old mother of a 7-year-old girl and an 8-year-old boy. At the beginning of the study, she was taking classes at Western Michigan University toward a B.A. degree in social work. During the summer, she did not take classes but worked as a volunteer two or three days, or 20 hours, per week.

Both families signed a consent form in which they gave their
permission to have their families observed, to have the tape-recordings listened to, and to have the results of the study communicated while maintaining their anonymity. They also signed a contract that specified what they had to do and what they would receive.

Apparatus

Each family was provided with one solid state transistorized cassette tape recorder which they kept throughout the study. Every week each family received five 60-minute tapes. When the family returned the tapes, a copy was made mixing the original tape with a tape consisting of a 10-second interval verbal count (that is, the experimenter counted one number every ten seconds). In this way an interval measure could be taken and the reliability scorer could code verbal responses made exactly with the same intervals as the experimenter, even when stopping or rewinding the tape. To mix the tapes, three tape recorders were necessary: one playing the parent's tape, the second playing the 10-second interval tape, and the third recording the mixture of both tapes. The tape recorders were Wollensak 3M Model 2520. In addition, a mixer Wollensak 3M was used, as well as three patch cords with pin and standard plugs.

A watch with a second hand was used by each parent to indicate the duration of the tape-recordings and codings.

Data Collection

All the data on parents' behaviors were collected from tape-recordings of family interactions.
Tape recording

During the first meeting of the program, the parents received a handout that contained instructions on how to conduct a tape-recording session, with details on where to place the tape recorder, volume of recording, and how to make a clear recording. They were asked not to change their family interactions during the tape-recordings, and to tell the children the general purpose of the recording if they asked. The children could listen to the recordings together with the parents, but they were not permitted to operate the tape recorder alone in order not to damage it. Parents were asked not to threaten the children with the tape-recording; it was supposed to become a natural part of the situation. If the parents recorded something confidential, they were instructed to erase that part of the tape if they wished.

At the start of each taping, the parent said the date, the time and the situation, and after 15 minutes or when the situation ended, she stopped the recording. The requirement of 15 minutes of recording was done in order to increase the likelihood that 10 full minutes would be available for coding behaviors. Sometimes the situation lasted less than 10 minutes, and that occurred if, for instance, a meal was over in 7 minutes and the targeted situation was mealtime. In this case, the data were transformed into a comparable unit by taking the number of responses for each category and first multiplying this number by 10 and then dividing by the number of minutes.

During the recording, if someone had to leave the place where the tape recorder was on, the mother was instructed to take the
recorder with her, using the batteries provided. When the children and the mother were in different rooms, the mother was asked to stay near the tape recorder since her behaviors were the ones coded.

Each parent chose three situations that she wanted to change. Family A had reported that the times of the day when the mother had the most problems with her daughter were at meals, naptime, bedtime, when it was time to pick up toys, and when the mother was on the phone. The main problems in all these situations were non-compliance back-talking, and being too loud. The three situations chosen for Family A were mealtime, the time for picking up toys, and naptime.

For Family B, the situations that constituted problems were getting dressed on time in the morning, eating breakfast on time, arguing between the children while watching TV, and quieting down to sleep. A problem that occurred throughout the day was arguing and using "bad" language. The mother reported that she wanted to participate in the program to learn how to be consistent in the education of her children. The situations chosen for Family B's recordings were breakfast, getting dressed in the morning, and bedtime.

The parents were required to tape-record each situation two or three times weekly, totaling a maximum of 9 tapings per week. They could choose the days they wanted to do the recordings.

Coding by parents

During the experimental phase, the parents coded their own behavior from the tape-recordings. The number of codings required per week ranged from 0 to 5 depending on the experimental condition. The
amount of time needed to code a 10-minute situation varied between 10 minutes (when they knew the duration of the recording) and 30 minutes (when they had to determine the duration of the recording and also had to rewind the tape several times for clarification). When the recording was less than 10 minutes, the time spent in coding it was also less.

The parents were provided with written instructions for coding, definitions of the categories of their behaviors, several data collection sheets, and graph paper.

Parents coded every phrase, statement, or comment into one of five categories of behavior:

1. A correct command was one that specified an act of compliance which could be initiated by the child within 10 seconds, that was said in a normal tone of voice, that did not specify aversive consequences, that was not a bribe, that was not the repetition of a command, and that specified the referents, (for instance, the objects to be picked up).

2. An incorrect command was one that did not have all of the above characteristics of a correct command.

3. Attention for the child's inappropriate behavior was any phrase said to the child while he/she was acting inappropriately. The phrase could be a punishing one, the announcement of an unpleasant consequence, a command, a remark, the reasons why the child should do or not do something, or just conversation.

4. Attention for the child's appropriate behavior (interaction) was a word or phrase said to the child while he or she was acting
appropriately, or at least not acting inappropriately. The phrase could not be an aversive one, nor could it be descriptive praise. It was conversation or verbal approval where the approved behavior was not described.

5. Descriptive praise for the child's appropriate behavior was an approval in which the approved behavior was stated clearly.

Parents tallied and then totaled the frequencies for each of the five categories. They also calculated the percentage of correct commands: \[
\frac{\text{correct commands}}{\text{correct + incorrect commands}} \times 100
\]

parents consequences: \[
\frac{\text{attention for appropriates (AA) + descriptive attention for inappropriates + AA + DP}}{\text{praise (DP)}} \times 100
\]

and the rate of appropriate consequences per minute: \[
\frac{\text{AA + DP}}{\frac{1}{\text{of minutes}}}
\]

This last measure was included since the percentage of appropriate consequences might be high, but the rate of appropriate consequences might be low. When the three rates were calculated, they were plotted on a graph; thus, comparisons could be made with previous days' codings.

Child's behavior

At the same time that the parents were tape recording, they also recorded their child's target behaviors on a piece of paper and later plotted them on a graph. A written record of the child's behaviors was required because the child's motor behaviors could not be identified through the tapes. But it was kept simple and easy because two sets of detailed observations would involved too much work for the
parent.

During the mealtime situation, Family A recorded the number of bites of food eaten by the child. In the situation where the child was required to pick up the toys, the mother recorded whether she picked up all the toys, half of them, or less than half. During the naptime situation, refusal to nap, kicking, and screaming were recorded. For Family B, the duration of getting dressed in the morning, the duration of breakfast, and the latency of quieting down after saying goodnight at bedtime were recorded.

**Coding by scorers and reliability measures**

When the therapist received the tapes, the mixed copies of the tapes were made, resulting in a recording with 10-second intervals. The same categories and definitions employed by the parents were used by the therapist. The only difference was that a frequency count within intervals was done instead of a total frequency count. Reliability was taken with all parents' codings, and a reliability scorer coded 27% of the tapes coded by the therapist, using both the method of frequency count within intervals and the total frequency count. The therapist selected tapes to be coded in a random order, and the reliability scorers did not know to which phase of the study the recording belonged, thus decreasing observer bias. The situations chosen for recording were equally distributed between the different situations and experimental conditions. In 15% of the tapes, the 10-second intervals were recorded; the other 12% of the tapes were those tapes directly recorded by the parents. Two people served as reliability
scorers. One coded tapes from Family B, and the other one from Families A and B. They did not know the families nor their names since the tapes showed only a letter identification.

Reliability with the parent and reliability scorers was calculated for each category using the formula:  
\[ \frac{\text{lower frequency}}{\text{higher frequency}} \times 100. \]

Occurrence reliability with the reliability scorer on the tapes with 10-second intervals was calculated for each category using the formula:

\[ \frac{\text{number of intervals of agreements on the occurrence of the behavior}}{\text{number of intervals of agreements on the occurrence + disagreements}} \times 100. \]

Overall reliability with the reliability scorer for each category had the formula:

\[ \frac{\text{number of intervals of agreements (occurrence + non-occurrence)}}{\text{number of intervals of agreements + disagreements}} \times 100. \]

Training on Coding

Parents and reliability scorers received a handout that contained the definitions and examples of the five categories of parents' behaviors. They were told to read it and to ask questions if they had any. Then an exercise in coding was conducted which consisted of 13 commands to be coded as correct or incorrect and of 12 consequences that had to be coded as descriptive praise, attention for the child's appropriate behavior, or attention for the child's inappropriate behavior. The answers were corrected and discussed, and if the percentage of correct responses was below 90% in either the commands or consequences parts of the coding exercise, further examples were given.
Next, the parent listened to one of her tapes and coded it on the standard data collection sheet. The same procedure was followed by the reliability scorers, with a tape selected at random. If either the parent or the reliability scorer obtained 90% or better agreement with the therapist, the data was plotted on the graph, and training was concluded. If reliability was below 90%, the therapist coded that tape together with the parent or the reliability scorer, answering questions and correcting mistakes. The parent or reliability scorer then continued coding without help, until 90% agreement with the therapist was obtained.

During the program, retraining was conducted when mistakes in the coding were noticed. The therapist coded a tape with the parent, and the definitions of the categories were again reviewed to prevent observer drift.

Training on Behavioral Principles

After baseline was completed, the parents read a handout that summarized the basic principles for behavior change. A lecture covered the same material, and discussion followed during which parents' questions concerning assumptions about the behavioral approach, their understanding of the principles, and the application of behavioral principles to their everyday lives were answered. The following topics were covered:

1. Definitions of correct and incorrect commands, as well as when and how they should be used, were explained. Various examples were given, and the parent was asked to give examples from her everyday
life.

2. Also taught was the concept of consequences of behavior, including positive reinforcement, acquisition of behaviors using continuous reinforcement, tokens, tangible reinforcement, activity reinforcement, Premack Principle, and descriptive praise. The parent was asked to give examples of reinforcers that she could use with her child. The other consequences discussed were extinction, response cost, and physical punishment and its dangers; in addition, when to use each of these consequences was covered. The criticism trap was explained, and the importance of consistency was stressed.

3. An explanation of the five categories of parents' behaviors was given, in conjunction with examples and definitions.

The parent was then asked to design a behavior change program for the first situation on which she was going to work. For Family A, the first situation was mealtime, while for Family B, it was breakfast. No help was given by the therapist in the design of the program. The parent developed it at home, basing it on the handouts already given. The intervention plan was reviewed by the therapist in the following meeting and, if it was incomplete or inappropriate, it was corrected. The same reasoning was applied to all behavior change projects elaborated by the parents: they were helped to analyze the contingencies maintaining the inappropriate behaviors, but no direct answers were given to questions like, "What should I do with my daughter when she uses bad language?" The reason for this was that if the therapist gave direct instructions as to what the parents had to do, the parents would not have a history of independent analysis and establishment of
intervention plans, and thus, would not be likely to do it in the future if a new problem arose.

Parents used a given format to set up the behavior change programs. This format required that they specify what behavior they wanted to occur, when it should occur, and what they would do after the behavior occurred. They also specified the behavior they did not want to occur, when it did occur, and what they would do after this behavior occurred. They kept these programs for future consultation at home.

Both families were encouraged to use this format whenever they observed a problem behavior that they wanted to change, so several blank formats were given to them.

Incentive System

In the contracts that the parents signed, the following incentive systems were described to them, involving prizes, cash deposit, certificate, and termination.

Prizes

Parents received 30 points each week for doing the required tape-recordings and codings. Bonus points were given for each tape-recording or coding done in addition to the required ones. A table indicated the number of points received according to the number of tapings and codings required and completed. The points were exchanged during the weekly meetings for a prize. The minimum price for a prize was 30 points; an additional prize was given for each 4 bonus points. The
prizes were small gifts ranging in price from 50¢ to $3.00. Free child care at the Western Michigan University day care center was included in the prize list.

In order to be useful, each tape-recording had to contain all the required information, had to be audible, and the parent had to make a corresponding written record of the child's behaviors. For each of these specifications not met, 80% of the corresponding points were deducted. Late delivery of any tape-recordings resulted in deduction of 40% of the possible points. In addition, the coding had to be done before making the following tape-recording. Failure to do so resulted in a loss of 80% of the corresponding points because the parent would not be affected by the procedure before the next data point.

Cash deposit

The parents agreed to make a deposit of $10.00 three times during the program which then would be returned to them, provided they completed the program in the specified manner and they returned all the tapes and the tape recorder in workable condition. They were told that costs for repairs would be deducted from the amount of the deposit to be returned.

For each tape-recording required, 20¢ was credited if it was done on time (10¢ if late), if it contained all the required information (5¢ if not), and if it had the corresponding data on the child's behavior (5¢ if not). For each tape-recording plus coding required, 50¢ was credited if it met the above requirements (10¢ if not), and if it was done before the next tape-recording (10¢ if not).
Had either parent dropped from the program before its completion, she would have received the money credited to her up to that time.

Certificate

At the end of the program, parents received a certificate indicating that they had completed the program on effective parent training, and, furthermore, had exhibited outstanding participation.

Termination

Parents agreed to terminate their participation in the program if they obtained less than 50% of the required points for two consecutive weeks, or for four non-consecutive weeks. Exceptions were made in case of unforeseen circumstances.

The parent and the therapist each had a copy of the point and money accountability sheets that were filled in by the therapist during each weekly meeting.

Description of the Meetings

During the initial interview, a program description was given to the parents and explained. It stated that parent training programs are necessary since child education is one of the hardest jobs, but that parents do not receive instruction for this kind of job. It compared the present program with other behavioral parent training programs, concluding that the present one would enhance a general application of the program without further help from a professional. It explained that the study would consist of tape-recordings and codings
and that parents would monitor their own progress through graphs. The preventative nature of the program was underlined. The amount of work and time involved was pointed out, so that the parents would not start a program and drop out because of lack of time.

The incentive systems were then explained, and the contract and consent form were read, explained and signed. A two-hour weekly meeting was scheduled. For Family A, this meeting was held at the Child Development Center, where free child care could be provided. For Family B, this meeting was held at the parent's house at a time when the children were not at home.

During the first training session, demographic data were collected, and three problematic times of the day when the children's problem behaviors typically occurred were chosen by the parent. The problem behavior for each situation was defined with the assistance of the therapist, and a sheet was designed to collect data on those child behaviors. The parent received the handout with instructions on how to conduct the tape-recording sessions, as well as a tape recorder and five tapes. She paid the $10.00 deposit, and the accountability sheets were filled out. A time and place for picking up the recorded tapes and data sheets prior to the following meeting were established. In this way, the therapist was able to listen to and code the tape-recordings, thus establishing the following week's assignment and the number of points and money to be given to the parent.

During the second session, the parent received a handout summarizing basic principles for behavior change and the accompanying lecture and discussion. She also received the handout on how to code
her own behaviors along with definitions of the categories.

The mother was asked to study the handouts during the week and to be prepared to participate in the exercise on coding during the third meeting. She was also asked to design a behavior change program for the first situation on which she was going to work. No tape-recordings were required, but if they were done, two bonus points were given for each. Completion of the behavior change form was worth 20 points, and completion of the exercise on coding was worth 10 points.

During the third meeting, the first behavior change project was reviewed, and the exercise on coding was applied.

A home visit was included during this week to help the parent do the first coding.

In each weekly meeting, the points and money accountability sheets were filled out, and prizes were given after the therapist listened to the tape-recordings and calculated reliability with the parent's coding. Quality and correctness of tape-recordings, codings, and graphs were discussed, and any increase in the parent's correct behaviors was descriptively praised. During one meeting, the parents were asked to analyze their own behavior from the graphs. They looked at each graph and stated whether their behaviors were improving or not, and why. When reliability of coding was low, parent and therapist coded that recording together. The duration of the meetings was reduced to one hour after the fourth meeting. Midweek telephone calls were always conducted in order to check progress, to solve any problems, and to remind parents of the tape-recordings, if necessary.
Experimental Design and Sequence of Conditions

The experimental design was a multiple baseline across situations for each family. For each situation, the sequence of conditions was the following.

Baseline

The situation was tape-recorded at least three times. No instructions or consequences were involved.

Training

Parents received instruction on the principles of reinforcement and on how to deliver correct commands and differential reinforcement. They implemented the program for child behavior change that they had earlier developed. The situation was tape-recorded at least three times, and the parents coded and graphed their own behavior from every tape-recording. Their rates of correct responses had to show improvement over baseline before moving to the next condition.

Fading 1

The situation was tape-recorded at least three times, and the parents coded and graphed their own behavior from one out of two tape-recordings. If rate of correct responses was dropping, the parent would code and graph her own behavior from every tape-recording again, as in the training condition.
Fading 2

The situation was tape-recorded at least three times, but no coding and graphing were required.

During training for the first situation, baseline was continued for the other two situations, with at least two tape-recordings for each situation per week. During training for the second situation, baseline was continued for the third situation. Training for the third situation was introduced for Family A but not for Family B where it remained at baseline and served to measure any generality effect. It was introduced for Family A since some problems during nap-time were still occurring.

Generality was defined as the occurrence of a change in parental behaviors in a baseline situation in the same direction as the change occurring in the experimental condition where self-recording was the independent variable.
CHAPTER III

RESULTS

Treatment and Generality Effects

A decrease in the mean frequency of incorrect commands, the mean frequencies of total commands, and the mean frequency of attention for inappropriate behaviors was observed with both families, as can be seen in Figures 1 and 2, as a function of the direct and generality effects of self-recording. In addition, an increase in the mean frequency of descriptive praise statements delivered was also observed for both families.

During baseline in the dinner situation for Family A, data were collected for four sessions. As shown in Figure 1, frequency of incorrect commands for Family A was 12, and ranged from 5 to 25. With the institution of the self-recording procedure in the dinner situation during 11 sessions, the mean frequency of incorrect commands decreased to 5.6 with a range of 0 to 18. During the following 22 sessions, when self-recording was also initiated for the situation of picking up the toys, the mean frequency of incorrect commands decreased further to 1.1 with a range of 0 to 6. During fading, conducted for 6 sessions, in which self-recording was discontinued, the mean frequency of incorrect commands was .7 and ranged from 0 to 2.

Table 1 shows that the difference between the lowest and highest frequency of incorrect commands during dinner decreased after
FIGURE 1

MEAN FREQUENCY OF INCORRECT COMMANDS, TOTAL FREQUENCY OF COMMANDS, DESCRIPTIVE PRAISE, AND ATTENTION FOR INAPPROPRIATE BEHAVIORS PER 10-MINUTE SESSION DISPLAYED BY FAMILY A DURING EACH EXPERIMENTAL CONDITION.
FIGURE 2

MEAN FREQUENCY OF INCORRECT COMMANDS, TOTAL FREQUENCY OF COMMANDS, DESCRIPTIVE PRAISE, AND ATTENTION FOR INAPPROPRIATE BEHAVIORS PER 10-MINUTE SESSION DISPLAYED BY FAMILY B DURING EACH EXPERIMENTAL CONDITION.
<table>
<thead>
<tr>
<th>Situation</th>
<th>Incorrect Commands</th>
<th>Total Number of Commands</th>
<th>Descriptive Praises</th>
<th>Attention for Inappropriate Behaviors</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean (BL)</td>
<td>Mean (P1, P2, P3)</td>
<td>Mean (BL)</td>
<td>Mean (P1, P2, P3)</td>
</tr>
<tr>
<td>Naging</td>
<td>15 (8)</td>
<td>1.5 (8, 4, .3)</td>
<td>28 (15, 8)</td>
<td>0.2 (8, 2, 3.8)</td>
</tr>
<tr>
<td></td>
<td>9.5 (4.2, 3.2)</td>
<td>5.2 (2.1, 2.5, 1.7)</td>
<td>21.2 (28, 2, 4.1)</td>
<td>7.5 (28, 2, 4.1)</td>
</tr>
<tr>
<td></td>
<td>4 (3, 0, 0)</td>
<td>5 (0, 0, 1)</td>
<td>0 (0, 0, 0)</td>
<td>6 (0, 0, 0)</td>
</tr>
<tr>
<td></td>
<td>6 (6, 17, 9)</td>
<td>3 (6, 9, 17, 9)</td>
<td>3 (6, 9, 17, 9)</td>
<td>3 (6, 9, 17, 9)</td>
</tr>
</tbody>
</table>

Note. BL indicates baseline. P1, P2, P3 indicate procedure with first, second, and third situations respectively. P1, P2 indicates fading 1 and 2 respectively.

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self-recording was initiated. Thus, not only did the mean frequency of incorrect commands decrease, but also the variability in frequency.

During the situation of picking up toys, the mean frequency of incorrect commands was slightly higher than during dinner, during the four baseline sessions. As can be seen in Table 1, the variability was approximately the same. During self-recording of the dinner situation, the situation of picking up toys remained in baseline for another eight sessions, as part of the multiple baseline design, but a decrease of 47% in the mean frequency of incorrect commands was observed. Variability of responding also decreased by 33% of the baseline variability. When the self-recording procedure was introduced directly in the situation of picking up toys, the mean frequency decreased further to 13% of the baseline levels. Variability between sessions also decreased by 76% during this period. During the three sessions of fading, the mean frequency of incorrect commands increased slightly but was still only 20% of baseline levels. Variability between sessions remained at the lowered level during fading.

During naptime the mean frequency of incorrect commands was five during the first three sessions. During the following six sessions, when the procedure was introduced in the dinner situation, the mean frequency of incorrect commands increased to 9.5 with a range of 3 to 14. During the next 16 sessions when self-recording was being done in the two other situations, the mean number of incorrect commands decreased to 4 with a range of 0 to 12. Self-recording was then introduced, and the incorrect commands dropped to 3 ranging from 0 to 8. A clear trend in the degree of variability from baseline to
self-recording was not observed.

The same trends that occurred with the frequency of incorrect commands were also observed with the total frequency of commands, as shown in Table 1 and Figure 1. After the introduction of the self-recording procedure in the dinner situation, Family A delivered fewer correct and incorrect commands during both the dinner and picking up toys situations. After the procedure was introduced during the situation of picking up toys, a decrease in the frequency of total commands was observed in all three situations. A slight decrease of 24% was observed during naptime, after the introduction of the self-recording. Variability in the frequency of total commands also followed the same patterns as with the incorrect commands.

Similar results occurred in the mean frequency of attention for inappropriate behaviors. Reductions of 85%, 77%, and 60% for dinner, picking up toys and naptime, respectively, were observed from baseline to fading. The variability of the responses diminished as compared to baseline levels, but the difference between minimum and maximum frequency had still an absolute value of 19 during dinner, 12 during picking up toys, and 20 during naptime, in the last condition. The increase of the mean frequency of attention for inappropriates that occurred when the self-recording procedure was introduced to the nap-time situation was of only 4% in relation to the overall baseline rate of attention for inappropriates.

The frequency of descriptive praise at dinner increased from a baseline average of two per session to a mean of four after the introduction of the procedure during dinner. Instances of praise further
increased to an average of 4.7 per session, when self-recording was also done during the situation of picking up toys. During fading, praise statements increased to an average of 9.2 per session. During the situation of picking up toys, generality was first observed when the procedure was introduced to the dinner situation, but a larger increase occurred when the procedure started in this situation. When self-recording was discontinued during fading, the mean frequency of descriptive praise dropped to a slightly lower mean than during baseline. During naptime descriptive praise was practically nonexistent until self-recording started, showing no generality effect. Variability followed the same trend as the mean frequency of descriptive praise. When the mean was low, the variability was also low, and when the mean increased, so did the variability.

The results for Family B generally followed the same patterns as Family A, as can be observed in Figure 2 and the lower part of Table 1. However, some differences were seen. In the graph of the total frequency of commands, an increase was observed during Fading 1 in all three situations with a return to the previous level during Fading 2. In the graph of frequency of attention for inappropriates, the frequency increased during the dressing situation in contrast with the other situations and with the results for Family A. In the graph of frequency of descriptive praise, since self-recording was not introduced in the bedtime situation, neither direct nor generality effects were observed throughout the conditions. In the graph of frequency of incorrect commands, total number of commands, and attention for inappropriates in the bedtime situation, two differences occurred.
compared with Family A. The procedure was not applied with Family B, and a decrease was observed in relation to the baseline. In the dressing situation the changes from baseline were inferred because of the absence of baseline data. The means obtained for the dressing situation during \( P_1 \) were compared to the means of the baselines of the breakfast and bedtime situations. A decrease of 55% was obtained for incorrect commands, of 24% for total frequency of commands, of 82% for attention given to inappropriates, and an increase of 60% was obtained for descriptive praise. The actual frequencies of all behaviors were much lower for Family B than for Family A. The higher mean of total frequency of commands of Family B was 20% of the higher mean of total commands of Family A. The frequency of descriptive praise statements of Family B were also lower than for Family A by 53%. As with the actual frequencies, the ranges for Family B were smaller than for Family A, that is, variability was not great. The patterns of variability were not the same between Families A and B. Family B did not show definite trends within the variability. The self-recording procedure was not introduced to the third situation, because the levels of behavior were already acceptable.

The mean frequencies of attention for appropriate behaviors did not show systematic trends across conditions after the introduction of the self-recording procedure and thus were not presented in Table 1. Family A increased the mean frequency per 10-minute session of attention for appropriates at dinner from 23 at baseline to 29 for the other conditions, decreased from 31 to 27 during the situation of picking up toys, and decreased from 6 to 5 during naptime. Family B
increased the mean frequency of attention for appropriates at breakfast from 27 at baseline to 51 for the other conditions, increased from an estimated mean of 20 to 47 during the dressing situation, and increased from 16 to 18 during bedtime.

Parents' graphs of their responses were not identical to the therapists's graphs, but they had approximately the same trends, such that they reacted to generally the same types of data as that of the therapist.

Reliability

Reliability data were calculated for the training sessions in coding, as well as for the actual coding with the parents and with the reliability scorers.

Training in coding

An overall mean of 93% was obtained during the training sessions on coding with the therapist. The reliabilities for each family and each reliability scorer for each part of the training is shown in Table 2.

Reliabilities averaged 93% with a range of 89% to 100%.

Reliability with parents

Reliability with the therapist was calculated for all parents' codings. Table 2 shows the mean reliabilities of the 53 codings of Family A and the 38 codings of Family B for each category. The mean of the difference between therapist's and the parents' codings in
<table>
<thead>
<tr>
<th>Subjects</th>
<th>Exercise on Coding</th>
<th>Practice Coding From a Tape</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Commands</td>
<td>Consequences</td>
</tr>
<tr>
<td>Family A</td>
<td>100</td>
<td>92</td>
</tr>
<tr>
<td>Family B</td>
<td>88</td>
<td>100</td>
</tr>
<tr>
<td>Scorer 1</td>
<td>94</td>
<td>92</td>
</tr>
<tr>
<td>Scorer 2</td>
<td>91</td>
<td>89</td>
</tr>
</tbody>
</table>
actual numbers for each category was also calculated.

The mean reliability for Family A was 60%, with a range of 47% for attention for inappropriate behaviors to 81% for descriptive praise. The mean frequency difference between parent and therapist was 4.4 and ranged from 1.1 for descriptive praise to 11 for attention for appropriate behaviors.

The mean reliability for Family B was 67% and ranged from 43% for attention for inappropriate behaviors to 89% for attention for appropriate behaviors. The mean frequency difference between parent and therapist was 1.5 and ranged from .45 for incorrect commands to 3.8 for attention for appropriate behaviors.

In most of the codings, both families had a lower frequency of correct commands, incorrect commands, and attention for inappropriate behaviors than did the therapist. Family A also had a lower frequency of attention for children's appropriate behaviors than the therapist, but Family B had generally a higher frequency than the therapist in this category. For descriptive praise, the number of sessions in which parents had a higher frequency than the therapist was almost the same number of sessions where they had a lower frequency than the therapist.

As can be observed in Table 3, there was no correlation between the percent reliability and the frequency difference. A higher reliability was not always associated with a lower frequency difference. The frequency difference was correlated with the mean frequency of each category. If the mean frequency of the category was high, the mean difference was higher than when the mean frequency of the category was low.
TABLE 3

MEAN PERCENTAGES OF RELIABILITY AND MEAN
ABSOLUTE FREQUENCY DIFFERENCES BETWEEN THERAPIST AND PARENTS

<table>
<thead>
<tr>
<th>Family</th>
<th>Correct Commands % f-f</th>
<th>Incorrect Commands % f-f</th>
<th>Descriptive Praises % f-f</th>
<th>Attention for Inappro. % f-f</th>
<th>Attention for Appro. % f-f</th>
<th>Mean for All Categories % f-f</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>58.3 1.3 81.1</td>
<td></td>
<td></td>
<td>47.5 51.1</td>
<td>60 4.4</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>72.7 64.4 69.1</td>
<td></td>
<td></td>
<td>43.1 89.3</td>
<td>67.1</td>
<td></td>
</tr>
</tbody>
</table>

^f-f indicates absolute frequency difference
Reliability among scorers

Reliability scorers coded 61 situations for the entire study, 33 of which were divided into 10-second intervals. For these 33 situations, 15% of the total number of situations, occurrence reliability and occurrence plus non-occurrence reliability were calculated. The averages and ranges of these reliabilities for each category are shown in Table IV. The mean occurrence reliability was 87% and the overall mean (occurrence plus non-occurrence) reliability was 99%. Total frequency reliability was calculated for the 61 situations, or 27% of the total number of situations. As can be seen in Table 4, frequency reliability was slightly lower than occurrence reliability. It was always higher than the frequency reliabilities obtained with the parents.

Incentive System

Family A obtained 83% of the required points and obtained a mean of five bonus points per week, with a range of 0 to 26 bonus points. She received a total of 13 gifts during the 13 meetings held. A total of $27.20 was credited to her, and she lost a total of $7.00.

Family B obtained 95.5% of the required points and obtained a mean of 14.5 bonus points per week, with a range of 0 to 39 bonus points. She received 128 hours of free child care and four gifts during the 11 meetings held. A total of $24.20 was credited to her, and she lost a total of $1.30.
TABLE 4

MEAN PERCENTAGES AND RANGE OF RELIABILITY BETWEEN PRIMARY AND SECONDARY SCORERS FOR EACH CATEGORY

<table>
<thead>
<tr>
<th>Response Category</th>
<th>Correct Commands</th>
<th>Incorrect Commands</th>
<th>Descriptive Praises</th>
<th>Attention for Inappropriate</th>
<th>Attention for Appropriate</th>
<th>Mean for all Categories</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Oa</td>
<td>Ov</td>
<td>Y0</td>
<td>Oa</td>
<td>Ov</td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>84</td>
<td>99</td>
<td>82</td>
<td>99</td>
<td>80</td>
<td>99</td>
</tr>
<tr>
<td>Range</td>
<td>0-100 95-100</td>
<td>0-100 95-100</td>
<td>0-100 95-100</td>
<td>0-100 95-100</td>
<td>0-100 95-100</td>
<td>17-100 85-100 12-100 52-100 95-100 43-100</td>
</tr>
</tbody>
</table>

*a* indicates occurrence reliability

*b* indicates overall (occurrence plus non-occurrence) reliability

$c$ indicates total frequency reliability
Parental Involvement Plans and Children's Behavior Change

The intervention plan developed by Family A, with slight modifications suggested by the therapist, was as follows. Only one command was to be given, no further commands were to be delivered when the child was not eating. Descriptive praise and approximately two minutes of conversation were given after each bite. The child also got an edible treat if she ate at least three bites of each food item on her plate, and she would go play outside. The parent did not insist if the child did not want to eat, but simply removed her plate. The dinner had to be finished within 15 minutes for the reinforcer to be given.

The changes reportedly observed in the child's behavior by the parent after the introduction of the procedure were that she was eating three bites or more of her food in 72% of the dinners, compared with 50% at baseline. Also, the time spent during meals shortened considerably, though no systematic data was collected on the duration of meals.

The parent's intervention plan for picking up toys was to give descriptive praise while the child was picking up toys, and two small edible treats after she picked up all of them. All the toys had to be in place within 15 minutes. Inappropriate behavior was ignored. Only two commands were given.

According to the parent, the child's behavior did not improve after the introduction of this procedure. After six self-recordings by the parent, the therapist asked her to analyze her own behavior.
from the graphs during a meeting. The procedure was also analyzed, and it was decided that one edible treat be given when the child had half the toys picked up, and another one when she had picked up all the toys. After these changes were instituted, the frequency of descriptive praise and attention for appropriate behaviors increased, and for the following eight sessions, the child picked up all her toys. Before this date the child picked up all her toys in 40% of the sessions; afterwards she did so in 77% of the sessions.

For the naptime situation, no intervention plan was designed. The child's behavior changed in the desired direction at the same time that it changed in the situation for picking up toys. Before that date, the child refused to go to bed 87% of the time, after that, only 27% of the time. After the introduction of self-recording for the situation of picking up toys, this lower rate of refusal maintained.

Anecdotally, changes in parent and child's behavior also occurred in other situations. When driving with the child in the car the parent reported that the child used to be "rowdy", often kicking the foot pedals. During the program, the child reportedly stopped doing that. The mother reported giving more attention for appropriates while driving and giving tangible reinforcers such as a small toy when the child behaved well in the car. The mother also reported that the child was generally much calmer, and that their relationship was becoming a much more loving one.

The mother also taught a friend of hers how to deal with the inappropriate behaviors of the friend's son, with resulting behavioral changes. The mother also reported applying differential reinforcement,
descriptive praise, and a low number of correct commands with this boy while babysitting with him.

Family B's intervention plans were initiated at the same time for breakfast and dressing. The mother had not been tape-recording the dressing situation before, but since she designed a program for it, it was decided that this would be the second situation. Interruption of telephone conversation was the original situation being tape-recorded, but since this problem did not occur during baseline, the situation was changed to the dressing time.

The programs that the parent designed were as follows. She gave a ticket to the children if they were dressed within 10 minutes. With five tickets, they were taken to the library. The parent either read a story or turned on the television if the children had finished breakfast within 10 minutes.

The program for the use of bad language was discussed during the seventh meeting for the first time, because at that time this behavior started to increase in frequency. It consisted of giving descriptive praise for the child who was ignoring the other child's use of bad language and for cooperative interaction and play.

At breakfast during baseline, the parent recorded that 33% of the sessions were below the criterion of 10 minutes. After the introduction of the procedure, the criterion was reached in 90% of the sessions. The criterion was reached in 92% of the dressing sessions. At bedtime the children were quiet in 20 minutes or less in 87% of the sessions.
CHAPTER IV

DISCUSSION

The first research question asked if parents' coding and graphing of their own behavior from audio-recordings made in their homes was an effective way of obtaining behavior change. Based on the results of this study, this question can be answered positively, that is, a treatment effect was observed. For both families, each time that the procedure was introduced, the mean frequency of incorrect commands and the total frequency of commands decreased, and the mean frequency of descriptive praise increased. The mean frequency of attention for inappropriates decreased, with two exceptions. The increases on the other two occasions were only 4% in relation to the overall baseline rate of attention for inappropriates for each family, and they were observed after the occurrence of a generality effect.

The second research question asked if appropriate parenting behaviors obtained through self-recording would show generality, that is, would occur in different situations than those in which coding and graphing occurred. The answer to this question is also positive. With the introduction of the self-recording procedure in the first situation, the behaviors changed in the desired direction in the second situation for Family A and in the second and third situations for Family B, except for descriptive praise, which showed minimal changes.

When the procedure was introduced for the second situation, generality was observed in the third situation in all but one case, which
was descriptive praise at bedtime. The descriptive praise increase at naptime was also very small.

It is interesting to note that further changes in the desired directions occurred in all behaviors in the first situation after the introduction of the procedure in the second situation. This finding is similar to those of Herbert and Baer (1972) and Horton (1975). In both studies, further improvements were observed when self-recording was introduced for a second time.

When the number of self-recordings diminished in the first fading condition, 12 out of 20 means changed to the opposite direction. However, these changes were small; the ratio of behaviors did not return to baseline levels, and they were observed only during the first sessions of the fading condition for both families. The negative effect of the removal of self-recording was temporary, however. The rates of the behaviors remained low or decreased even more, as observed with Family B during Fading 2, except for attention for inappropriate behaviors given during dressing. Rosenbaum and Drabman (1979) stated in their review of self-control training in the classroom that desirable effects associated with self-recording may be short-term, requiring the addition of reinforcing contingencies for their maintenance. This was not necessary in the present study.

From these results it can be concluded that positive parental behavior change occurred in both targeted and non-targeted situations as a function of the number of codings done. The larger behavioral changes were observed after the maximum number of codings in all three situations for Family A and in both situations for Family B.
This conclusion is not completely applicable for the use of descriptive praise. Changes in the frequency of descriptive praise were obtained when self-recording was introduced, but the generality effects observed were not large nor were they maintained after the removal of the procedure. This finding is in agreement with the results of the study by Horton (1975) on the rates of behavior-specific praise of teachers. It is possible, therefore, that if he had had the teachers self-record other categories of behaviors, generality across subject matter would have occurred.

Some variability was observed in the data between sessions, situations, and families. Differences in parents' behaviors between sessions to a great extent seemed to be due to the appropriateness of the children's behaviors. When the child was inappropriate, the total number of commands was higher, as well as the attention for inappropriate behaviors, since any vocalization, even correct instances of punishment, would be coded as attention for inappropriates. The frequency of attention given for appropriate behavior also decreased when the child was behaving inappropriately. The introduction of two other categories, i.e., silence following inappropriate behavior and silence following appropriate behavior, would make it possible to better analyze the variability, since a rate of correct consequences (attention for appropriates and silence for inappropriates) could be calculated. Other factors such as illness or other extraneous variables may have also affected parental responses.

The largest difference observed between situations was that behaviors at naptime and some behaviors at bedtime had a lower frequency
than in other situations. This occurred because the interactions between mother and children occurred only during a few minutes' time, and after this period, the children were supposed to sleep.

Variability between families was large in some of the response categories, even when the same general treatment effects were observed. It is not clear which variables contributed to this difference, though most of them may lie in the past history of reinforcement of each parent. However, the difference in the total number of behaviors per session, independent of categories, was not very large. One reason that the patterns of interaction were different may be the characteristics of the children, such as number of children present, ages of the children, the appropriateness of their behavior. These findings are similar to those of Forehand et al. (1975), Delfini et al. (1976), and Peed et al. (1977), who reported different rates of commands between parents of clinic-referred and non-referred children.

If results are to be applied to the general parent population, a bigger sample of families would be needed. It should include families where both parents are present, where parents work fulltime, with parents of children of different ages, and with different child management problems. The procedure might also be tested with clinic-referred and non-referred children.

The procedure that was used consisted of several behavioral components, namely, tape-recording, listening to the tape, coding it, graphing the results, recording the child's targeted behaviors, establishing an intervention plan, reading theoretical material, and attending the weekly meetings with the therapist. It is possible that other
aspects of the program other than self-recording were responsible for the parent's behavior change and generality. Tape-recording alone did not seem to produce any behavioral change, since baseline rates did not show any systematic trend. The recording of children's behaviors was not responsible for any change either, since this recording started during baseline. The establishment of the intervention plan by the parent does not seem to be responsible for the change either, since the program initiated at dressing time was introduced together with the breakfast program for Family B, and definite changes in parental behavior occurred with the introduction of the self-recording procedure during dressing. An intervention plan was not introduced at naptime for Family A, but even after the improvements due to generality effects, parental behavior changes were still observed. Reading the theoretical material and the weekly meetings with the therapist may have been instrumental in the changes, but it is not likely that they alone could produce all the changes. O'Dell (1974), in his review on parent training, stated that although there is little research from which to base judgements regarding which techniques produce the best results with various types of parents, it appears that actual behavior training is necessary to produce measurable changes in parent behavior. Flanagan et al. (1979) found that a written presentation of material did not result in parents improving their skills with their own child in the home. These authors concluded that, where the instructor wishes to convey performance competence for a child, heavy reliance on written presentations should be avoided. However, it is possible that just listening to the tapes without coding and graphing them
would produce the same results. This is an interesting possibility to investigate because it would involve less parental and therapist time in coding and would eliminate the concern about reliability with parents. The parents could answer a set of questions after listening to the tapes that would not include the precise counting of behaviors.

For each family a mean of five and a half hours was spent by the therapist each week for 13 and 11 weeks for Families A and B, respectively. A total of 22 hours was also spent by the reliability scorers for the entire program with both families. However, only one and a half hours per week would be necessary if the program were to be clinically applied. The mean of one weekly hour spent copying and mixing tapes would not be necessary. Coding and graphing tapes would be reduced by one-third if only one situation were to be dealt with at a time by dropping the requirement of a multiple baseline. When changes were observed in one situation, another situation would be assessed, and, if necessary, the procedure would be implemented, while fading the procedure in the first situation. The three-hour time block of coding and graphing could be further reduced to 30 minutes if only half of the recordings done by the parent were to be coded by the therapist as a reliability measure. The duration of the meetings would remain the same, around one hour per week, longer in the beginning and shorter with the continuation of the program. The time used by the reliability scorers would not be necessary, since reliability checks could be maintained between parent and therapist.

The cost of each tape recorder was $16.00, and each tape was $1.00. This material can be reused for other parent training programs.
For both families, the money spent on gifts for the incentive system was less than $20.00. The money spent on incentives might be viewed as a less expensive equivalent to the money that would have to be paid for an observer to go to the homes.

The amount of time that would be spent is less than that in other parent training programs, if one considers that they usually involve a two-hour meeting per week plus home visits and time supervising home projects.

One and a half hours per week includes the assessment and procedure. Only one or two home visits would be recommended, but still it would be possible to obtain a large number of assessment sessions through tape-recording.

It can be speculated that if only a few days of observation data before and after treatment had been collected, the results may have been different than the ones observed. The variability and trends in parents' and children's behaviors might not have been visible, as well as the continued improvement across the conditions, showing a relationship with the frequency of codings. By doing a continuous assessment, it is also possible to relate specific procedures with behavior change.

The advantages of tape-recordings were already pointed out, but there are some disadvantages to their use as a means of assessment. First, parents have to be instructed and eventually trained on how to make clear and useful recordings. If not, many tapes will be of little value. Also, problems with the equipment can occur. Another problem is that an incentive system may be necessary if one wishes to
obtain sufficient tape-recordings. A pilot study in which an incentive system was not applied resulted in fewer recordings than were required. The use of a combined positive reinforcement and cost system worked well with Families A and B. Family B even made additional tapes and codings in order to obtain the free child care. The last drawback of the tape-recordings is that they do not preclude the need for direct observation in the home. Reliability scorers from the pilot study preceding this one and from a study by Nelson (1980) had more difficulties correctly coding the tape-recordings than did the scorers who directly observed at least one family interaction.

The two main problems encountered with coding the tape-recordings were that coding a tape was at times very tedious and reliability with the parent was not always high. A third problem was that the therapist had to obtain the tapes for a particular week before the meeting with the parent, in order to make decisions about changes in conditions and the number of incentive points to be awarded.

Problems with reliability were expected with the use of a frequency count. Verbal interactions do not always have a clear onset and offset and are frequently a sustained activity. Refined definition of a unit of observation of speech was done by Bergan (1977) who utilized the independent clause of speech as such a unit. However, this definition was considered too difficult for the parents to understand, and a less stringent unit, a sentence, was used. In such cases, the use of an interval measure is indicated (Roberts & Forehand, 1978). Indeed, with the use of an interval measure, occurrence plus non-occurrence reliability was 99%, and occurrence reliability was higher
than the frequency figure. It would be desirable to have parents use interval counts also, but the equipment needed to do this may make the cost of the program too high and would probably add difficulties for the parents in operating the equipment. Future improvements in recording equipment could solve this problem. The fact that four out of five categories of parent behavior were generally of low frequency made the frequency measure of reliability a very stringent method.

A difference in one point between codings could mean 0%, 50%, or 80% reliability, depending on whether the actual frequencies were 0 and 1, 1 and 2, or 4 and 5. Low reliability coefficients with parents were found earlier in other studies, as in Herbert and Baer's (1972) study. But, as Rosenbaum and Drabman (1979) concluded in their review of self-recording procedures, self-recording does not need to be accurate in order to produce desirable behavior change in targeted behaviors.

A question pertinent to the use of data assessed through tape-recordings is whether they are similar to data obtained through direct observation. The answer to this question was positive in previous studies (Bernal et al., 1971; Johnson & Balstad, 1975; Gang & Poche, 1980), but the behaviors being assessed were slightly different from the ones in this study. Nelson (1980) made this same comparison using categories of behavior similar to the ones used in this study. With those categories, the overall reliability between 12 home direct observations and 12 audio-tapes was 65%. The situation observed directly was also tape-recorded and coded afterwards. However, there were differences in definitions of the categories that prevented high
reliability coefficients between both sets of observations since the definitions of the categories included physical behaviors that could not be identified on the tape. For correct commands, the mean reliability was 66%, for incorrect commands it was 33%, for descriptive praise it was 94%, for attention for appropriates it was 74%. The first four categories had a low frequency and their range was from 0 to 100. The last category was higher in frequency, and the range of reliability scores was from 47% to 94%.

Other factors that seemed to have an effect on the relation between direct and audio-taped observations was that the observers seemed to pay more attention to the verbal behaviors of the parents and children when listening to the tape-recordings than when they were in the parent's home. In the live situations, they appeared to pay more attention to physical movements. In some instances, verbal behaviors were tape-recorded which the observers did not hear during the direct observation. Generally, however, the differences found between direct and audio-taped observations were in the frequency of responses per category and not in the rate of correct commands and appropriate consequences.

The self-recording procedure proved to be effective in producing parental behavior change, with a concommitant change in child behavior, and in producing generality to other situations involving different child behavior at different times of the day. It was interesting to note that no contingencies of reinforcement were designed for parental behavior change. Incentives were introduced only for the taping and coding. No contingency was introduced for good
reliability with the therapist either. Future studies might determine the effects of reinforcement on parental performance and on agreement between parent and therapist. It is possible that the changes would be greater with the addition of the contingencies, but the question is whether generality would be observed or not. It would also be interesting to investigate the frequency of tape-recording and codings necessary in order to obtain results.

Different methods of self-recording that would avoid the problems associated with the coding of the tapes but that would still produce generality and be economical in terms of the therapist's time should be investigated. One way would be to have a multiple baseline across antecedent and consequent parental behaviors. First, the parents would code and graph only the correct and incorrect commands. Then, training in coding and graphing would be introduced for the consequences and the self-recording would be faded for the commands. The category of attention given for appropriate behaviors could be eliminated, whenever a high rate of family interaction was observed during baseline. A category of non-descriptive praise could replace the one on attention for appropriates. This would reduce the number of behaviors that the parent has to attend to at the same time and could improve reliability. Another way would be to eliminate the coding process, as suggested before.

Self-recording as a procedure to produce behavior change and generality could be applied to other subjects and settings beside parents and homes. It could be applied to situations where supervision
is normally required, like the training of staff and teachers, thus
decreasing supervisor time and increasing trainee effectiveness.
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