Comparison of behavior changes of children in the home and school setting after parents receive instruction in behavior modification

Beverly Ann Beavers
University of the Pacific

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COMPARISON OF BEHAVIOR CHANGES OF CHILDREN IN THE HOME AND SCHOOL SETTING AFTER PARENTS RECEIVE INSTRUCTION IN BEHAVIOR MODIFICATION

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Beverly Ann Beavers
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COMPARISON OF BEHAVIOR CHANGES OF CHILDREN IN THE HOME AND SCHOOL SETTING AFTER PARENTS RECEIVE INSTRUCTION IN BEHAVIOR MODIFICATION

Abstract

The mother of 1 grade school child and 2 sets of parents of 2 preschool children were trained in the home to use behavior modification techniques to reduce the undesirable behaviors of their children. Generalization from the home to the school setting was investigated. There was no support for or against changes in the homes generalizing to the classrooms. The mother of a 7-year-old girl with borderline intelligence used "time out" to curb the child's failure to follow instructions, tendency to be argumentative, and tendency to tantrum. The hyperactivity of a 4½-year-old girl was diminished in part by changes in the parents' contingent behavior. A 4-year-old boy's stubborn refusal to obey instructions was extinguished by "time out" and praise as positive reinforcement for desirable behavior. The behaviors were counted in 10 sec. intervals for 5 hrs. for each child at each measurement, baseline₁, post instruction-conditioning₁, baseline₂, and post instruction-conditioning₂ in the home and baseline₁ and post instruction-conditioning₁ in the school. Contingency reversible periods were included in the home to show a relationship between the use of behavior modification techniques and the changes in behavior.
**Introduction**

Children's behavior can be changed if the punishments and rewards within the environment are changed. Parents can modify their children's behavior if the parents can learn to control the contingencies of the environment. That parents can be taught behavior modification techniques has been shown, e.g. Hall, Axelrod, Tyler, Grief, Jones and Robertson (1972); Hawkins, Peterson, Schweid, and Bijou (1966); Wahler, Winkel, Peterson and Morrison (1965); Allen and Harris (1966); Barrett (1969); Dupont (1968); Gardner (1967); O'Leary, O'Leary and Becker (1967); and Zeilberger, Samen, Sloane (1968).

Various techniques have been used in training the parents. Wahler, et al. (1966) used signal lights as cues to direct the behavior of mothers while they were interacting with their sons in a clinical playroom. The consultant watched the mother and son interact through a one-way glass, and used the signal lights, previously coded, to cue the mother in how to react to her son, e.g. yellow signal, ignore the behavior; blue, praise her son. Also in the clinical setting, Bernal (1969) televised mothers and sons together and used the video tapes for feedback while instructing the mothers in behavior modification techniques. Other consultants have gone into the home and used prearranged hand cues to train the parents how to react to their child's behavior much as the signal lights were used in the clinic, e.g. Hawkins, et al. (1966); Zeilberger, et al, (1968): O'Leary, et al. (1967): and Wahler (1969)(a). Risley and Wolf (1967) started the treatment of an autistic child in the clinic and then taught the mother to control the contingencies at home.
Allen and Harris (1966), and Gardner (1967) taught behavior management techniques by instruction alone, and Tharp and Wetzel (1969) devised techniques using a consultant to advise the parent or other mediator on how to change the behavior of a child in his natural environment.

Hall, et al. (1972) trained four parents in a Responsive Teaching class at the University of Kansas and carried out an experiment in which the techniques learned in class were applied using the parent as both observer and experimenter.

There are advantages to going directly into the home to instruct parents. Hawkins, et al. (1966) point out that the therapist seldom sees the child's behavior or the interaction between parents and child. They also say that the instructions by the therapist may be too technical or too general and thus difficult for the parents to translate into specific actions when dealing with the child at home. They also consider the evaluation of results difficult because no objective record of changes is kept.

Social agencies, such as a welfare department, receive requests from parents, foster parents and schools for help in coping with children who have behavioral problems. The combination of going into the home for direct observation in the environment in which the behavior occurs and using the consultant technique to train the parents seems a feasible approach to fit the structure of a welfare department. Going to the client's home is a regular procedure of the social workers and behavior modification training could be scheduled into the visits.
Another advantage of training in the home when the undesirable behaviors occur there is the question of whether learning in one environment generalizes to another, e.g. clinic to home or home to school. Wahler (1969)(b) found no generalization occurred between the home and school environments. Zeilberger, et al. (1968) reported in their experience if the contingencies in two separate settings differed, differential learning took place and the child behaved differently in each setting. They suggested treating the problem behavior in the environment in which it occurred.

The conceptual hypothesis of the present experiment was that parents can be taught behavior modification techniques to change the undesirable behaviors of their children that occur at home and school. Generalization, whether the behaviors change in the school as well as in the home, was investigated. The dependent variable was the frequency of specified undesirable behaviors of the children at home and at school, counted in 10 sec. intervals during 5, irregularly scheduled 1 hr. sessions. Six, 5 hr. counts for each child were made. There were three independent variables. 1) The instruction of the parents in behavior modification techniques and the conditioning of the children by the parents applying these techniques was the most important independent variable. This variable had six levels, four in the homes and two in the schools. These levels were baseline in the homes before any instruction-conditioning occurred; instruction-conditioning in the homes, baseline in the homes when the parents were asked to return to baseline conditions; instruction-conditioning in the homes when post-training conditions were reinstated; baseline in the schools before any instruction-
conditioning occurred in the homes; and instruction-conditioning, in the schools following training of the parents and conditioning of the children in the homes. 2) The hours in which the frequency counts were made was an independent variable, and 3) the location, home and school, was an independent variable.

The experimental hypothesis was the training in and use of behavior modification techniques by two sets of parents of two nursery students and by the mother of one grade school student would reduce specified problems behaviors of the children in the homes. Generalization from the home to school settings was investigated.

Method

The Children's Division of the Stanislaus County Welfare Department receives requests from parents, foster parents, and schools for services pertaining to the behavior of children. The three subjects selected for this study had been referred to a social worker because of behavior problems. Therefore, these subjects do not represent a random sample.

The general procedures for each family were the same. The specific behaviors of the children that were to be modified for this experiment were determined by observations and discussions in the homes and schools. The observation visits allowed the children and parents to adjust to the presence of the experimenter (E), and permitted E to practice using a stop watch and recording behavior in 10 sec. intervals.

All measurements were made by E counting the frequency of the undesirable behaviors in 10 sec. intervals for 5, irregularly scheduled, 1 hr. sessions. The behaviors were coded by number and counted individ-
ually. Only one instance of one kind of behavior was counted in any 1, 10 sec. interval. (See Appendix A for sample of count sheet.)

A 5 hr. count was made during baseline in the home and in the school for each child. A 5 hr. post instruction-conditioning count was also made in both settings for each child. Baseline and post instruction-conditioning counts were made in the homes only. The frequency of undesirable behaviors for each child in 10 sec. intervals was totalled for each 5, 1 hr. sessions and divided by 5 to determine the mean (M) 1 hr. frequency of undesirable behaviors.

During the instruction-conditioning period, the parents were instructed in behavior modification techniques using Patterson and Gullion (1968) for instruction in the basic concepts. When the conditioning of the child started, a plan of action regarding the undesirable behaviors was written out and given the parents. Parental participation in designing the plan was encouraged; and the parents of each child were given a notebook and requested to keep a daily diary of the occurrence of the undesirable behaviors and how they handled them. This notebook was to serve the double purpose of 1) encouraging the parents to think of the behaviors as specific actions instead of generalizations of the child being "good" or "bad" and 2) possibly make the parents more aware of how they were reacting to the child. Instruction-conditioning was limited by the termination of school for the summer because a second school measure was vital to the experiment.
Subject One

Lottie (psuedonym) was a seven year old girl who attended a special education class in a Modesto school. She was tested at the University of California Children's Clinic in San Francisco and found to have borderline intelligence. The fall of 1971 her mother approached the Children's Division of the Stanislaus Welfare Department regarding the possible placement of Lottie in a foster home temporarily because she felt she was no longer able to cope with her. Investigation by the social worker resulted in referring the couple for marital counseling which helped the family situation, but the parents expressed a desire for specific help with Lottie.

Lottie's family is an upper-middle class family, and both parents were working full time. When the experiment started, there was a 19 year old half-sister in the home who went to junior college and worked parttime. She stayed with Lottie a couple of hours in the afternoons after Lottie got out of school. The half-sister was not trained in behavior modification during the experiment. Lottie's mother reported Lottie sometimes misbehaved for the half-sister. Lottie also called her mother at work to complain. The half-sister moved out of the home a few weeks after the experiment started, but continued to take care of Lottie in the afternoons until school was out for the summer.

When E met Lottie she appeared to be a friendly, outgoing child. In the classroom this side of her personality was prevalent; however, during the experiment several instances of tantrum behavior on the school ground in the mornings when she arrived at school, during recesses and lunch periods were reported by the teacher and the principal. They said she spit at other children, hit other children, threw her lunch on the ground and was verbally abusive. In the classroom Lottie was
occasionally uncooperative and gave orders, but most of her undesirable behavior was attention seeking. She asked for attention, moved her desk, put on makeup and made an elaborate show of doing her lessons. She had a tendency not to do the work suggested by the teacher, but to work on something else, e.g. if the teacher suggested she "do the story" which meant copying the sentences printed on the blackboard, Lottie would work on her numbers. No issue was made of this. In this special class the children worked at their own speed at whatever they chose at that moment so there was no stress that Lottie follow the teacher's suggestion as long as she applied herself to something. Her behavior in the classroom seldom presented a problem for the teacher or her assistant. They responded to some bids for attention and ignored others. Lottie's behavior problems at school were generally on the playground during interaction with students from classes other than her own.

Five hours observation in the home and in the school indicated that the major objectionable behaviors occurred when the mother and child were alone. Lottie was verbally disrespectful toward the step-father on occasion, but there was no major control problem. The mother indicated she felt the step-father was too strict with the child.

In the home Lottie dominated her mother. She made frequent bids for her attention. An instruction given by her mother was often countered with an alternate suggestion by Lottie, a distraction tactic, or a glare. She was argumentative, and her mother often submitted to Lottie's suggestions. Insistence by the mother that Lottie follow the instruction as given had to be backed with a physical threat before Lottie
complied. After compliance, she retaliated with comments such as, "I don't like you," or "My mother is stupid." At times, the mother retorted with sarcasm.

Lottie often gave her mother orders. She would make a request and when her mother was fulfilling the request, Lottie would become very exact about how the request was to be met. Her mother was extremely patient and tried to meet all the demands. At times this was impossible, and the child became verbally abusive. Tantrums tended to follow such a chain of behaviors.

Lottie's misbehavior was not continual. She watched television, played by herself happily and even on occasion helped her mother by doing some small household chore. Much of the time she was affectionate and friendly.

The undesirable behaviors that were specified to be worked on for Lottie were:
1) Failure to follow instructions or suggestions, argumentativeness and verbal abuse.
2) Attention seeking behaviors such as saying, "Look at me," and an excessive show of doing her work at school.
3) Tantrums, defined as shouting and stomping, throwing or tearing up things.

Since both parents in this family worked, the visits and counts were in the evenings with the exception of three which were on Saturdays. Lottie's step-father was not home most evenings during baseline and instruction-conditioning, and since most of the instances of bad behavior were toward
the mother, the behavior modification training was given only to the mother. Lottie's mother was given a small notebook and asked to record instances when Lottie failed to follow instructions or was demanding and to briefly state what action she took. Baseline\textsubscript{1} in the home and school was taken April 24 through May 2. The frequency of undesirable behaviors was counted in 10 sec. intervals for 5, 1 hr. sessions in the home and school. The mean (M) 1 hr. frequency of undesirable behaviors in the home was 58.8, 10 sec. intervals and 31.8, 10 sec. intervals in the classroom.

Following baseline\textsubscript{1} Lottie's mother was given Patterson & Gullion (1968) to read. She did not keep the record of behaviors that E requested. "Time out" was discussed with Lottie's mother, and she said she already sent Lottie to her room as punishment. The importance of making Lottie remain in her room a specified time after the misbehavior stopped was pointed out. Also, not interacting with Lottie when she was in her room was stressed as it had been noted during baseline\textsubscript{1} that Lottie was sent to her room for only 10 sec. and that there was a constant verbal exchange during that time.

The following instructions were outlined:

1) Use "time out" immediately when Lottie does not follow an instruction or argues. Tell her exactly what behavior is desired, e.g. "Do not argue," or "When I ask you to bring me something, bring it." If she tantrums, leave her in her room 3 min. after the tantrum behavior ceases. Do not exchange comments with her or go to her when she calls.
2) Ignore verbal comments from Lottie such as, "I don't like you." Avoid sarcasm.

3) Reward her immediately with attention and praise when she does follow an instruction as given and without argument. Be specific about what she has done that is good.

4) Respond only to attention seeking behavior that is desirable behavior. Ignore undesirable attention seeking behaviors, e.g. putting her hands in her panties or "show off" dancing.

Three additional discussion and instruction visits were made during instruction-conditioning. On the first of these visits, Lottie asked her mother for a dessert. Her mother said, "No." Lottie insisted, and her mother offered her a small cake. Lottie said she wanted an ice cream cone, but her mother thought they were out of cones. Lottie again insisted and directed her mother's search of the cabinets. After they found a cone and her mother started to fill it with ice cream, Lottie complained she wanted the ice cream, "like the one at the ice cream store." Her mother explained the ice cream wouldn't hold together well enough to pile that high. Lottie became verbally abusive, and her mother put the ice cream and cone away. Lottie had a tantrum and was sent to her room where she threw things.

E supported the mother in not responding to Lottie's behavior or yelling and in leaving her in the room until she had been quiet 3 min. The mother seemed to find it difficult not to respond to the child's cries. Lottie was in her room 11 min. before she had been quiet the required 3 min. Then her mother told her to pick up the things she had thrown around her room and stood in the doorway until this was done.
Lottie complied readily.

Once out of her room, Lottie again requested the ice cream cone, saying she didn't care if it wasn't like the ice cream store's. Her mother said, "No," and Lottie started another tantrum, and was sent to her room. She remained there 5 min. before she had been quiet 3 min. A repetition of this episode occurred again when Lottie came out of her room the second time.

Following this one evening, Lottie's mother took a firm stand against Lottie's unreasonable demands. Lottie was observed on one occasion to stand pouting when refused a request, but when her mother ignored her, she quit pouting and behaved in a friendly manner.

The mother reported instances of differences, but it was apparent she was now in control, and not upset by the episodes. She reported one additional use of "time out."

The post instruction-conditioning counts were made at home and school May 30 through June 13. The mean 1 hr. frequency in the home was 19.0, 10 sec. intervals of undesirable behavior and 19.8, 10 sec. intervals of undesirable behavior in the school.

The parents were asked to start June 15 a reversal contingency period, that is, return to baseline conditions in the home. The baseline count in the home was taken during 5, 1 hr. sessions, June 20 through June 23. M=29.8, 10 sec. intervals of undesirable behavior. During this period there were some marital difficulties which distracted the mother from the experiment. Lottie's mother seemed to become more lenient with Lottie and the step-father more strict which appeared to be the pre-
Fig. 1. The frequency in 10 sec. intervals of Lottie's undesirables behaviors measured during 5, 1 hr. irregularly scheduled sessions in the home (solid line) and in the school (broken line). Baseline_1 -- before experimental procedures. Post instruction-conditioning_1 -- after Lottie's mother was trained in and used behavior modification techniques to change Lottie's undesirable behaviors in the home. Baseline_2 -- reinstatement of baseline contingencies in the home. Post instruction-conditioning_2 -- reinstatement of instruction-conditioning contingencies in the home. M is the mean frequency in 10 sec. intervals for each 5 hr. measurement period.
experimental situation in the home. The mother, however, did not become
dominated by Lottie during baseline₂ as she was during baseline₁.

The first week of instruction-conditioning₂, June 24 until the
evening of June 30, Lottie spent with her maternal grandmother. The post
instruction-conditioning₂ count was made July 5, 7 and 9; M=8.8, 10
sec. intervals of undesirable behavior in the home.

Lottie's family camps frequently on weekends in the summer. Following
the 4th of July weekend, the parents complained about Lottie wetting her
bed which occurs more frequently when they are camping. Lottie's mother
said that their physician does not think there is a physical reason for
this problem. The night of July 4th Lottie's step-father threatened to
take her new bedroom furniture away from her if she wet, and she stayed
dry that night. E suggested a program of positive reinforcement, and
the mother was receptive. See Appendix B for the behavior modification
program suggested.

Subject Two

Sally was a 4½ year old who attended a preschool class in Ceres,
California. The school reported her to be hyperactive. Her doctor
prescribed Dexedrine, 5 mg., but the teacher said her mother often
sent the child to school without giving her the medication. Sally was the
middle child and had a sister 7 yrs. old and one, 2 yrs old. The father
was unemployed.

During the first visit to the home, when the parents agreed to
participate in the experiment, they were advised it would be necessary
for Sally to have the medication regularly as prescribed. The parents and the school were asked to keep a record of whether or not the medication was given. The school's determination was dependent upon observed behaviors, excessive appetite and excessive activity indicated Sally had not had her medication. Data for any days in which there was not agreement about Sally having her medication was thrown out.

Observation in the home disclosed possibly some pride by the father in the activity exhibited by the child. He said that he was like that when he was a child. Sally's mother talked about Sally's misbehavior and during the observation period never showed the child any positive attention. She constantly admonished Sally to "be good" and often did not answer her requests or questions. The father, however, was responsive to the child. The family called Sally "Not Not," referring to the many knocks and bruises she received charging around.

As a result of four hours of observation in the home and school, the following undesirable behaviors were selected:

1) Hyperactivity. This was the principle problem. Sally was mostly on the go, climbing on furniture, throwing herself on the floor, wrestling with anyone available or running in and out of the house.

2) Bids for attention. At school, when she had her medication, she was generally much quieter than at home, but stayed at only one project a few minutes; then she would go to the teacher asking for something else to do. At home, she at times tracked her mother asking the same question repeatedly.

3) Destructive or mess-making activity.
The baseline count on Sally was made during 5, 1 hr. sessions, in the home and school during April 24 through May 9. During the measurement in the home, Sally was almost constantly on the move in an excited, nondirected way. The whole family, including visiting maternal relatives, wrestled and played aggressively with Sally and her 2 yr. old sister. They hit them with pillows, threw them around, laughed when the children attacked adults, encouraged the younger sister to tell Sally "no" and to hit her. Sally's mother often threatened to spank her if she "didn't behave" or "settle down."

Sally, it was noted, was generally very nice to her younger sister, and in some instances tried to help look after her, giving her a drink or taking her away from danger, and she also made overtures to help her mother, asking to open the pop and trying to help fold the clothes. Her mother was critical of Sally's efforts and responded, "You'll spill it," "You'll break it," or "You're not doing it right."

Sally climbed on the kitchen counter and got into the cupboards, tore up magazines and paper, repeatedly climbed on all the furniture including the coffee table, ran in and out of the house, and rolled on the floor. When Sally's father was home, she was still very active, but responded to his directions. He treated her in a tolerant and friendly manner.

Sally was receiving her medication regularly during this period. For short intervals Sally sat in her rocking chair or on the floor and watched TV or listened to the adults talking. In order to encourage Sally's mother to be aware of these moments, E give her a notebook and requested that she record any time Sally was quiet.
At school in the afternoons during baseline₁, Sally was extremely quiet, more so than during the observation period. She worked quietly at the tables or painted. When on the playground, she swung most of the time instead of wandering from one thing to another as she had done during the observation period.

On the last day of baseline₁, the teacher advised E that on the previous Friday Sally was sent home because she had not had her medicine and was uncontrollable. E had been to the home that A.M. and no one had been home. However, on the last day of this measurement, Sally had had her medicine and spent 35 min. at one table cutting and drawing. It was noted that her interaction with the other children had improved compared to the observation period when she almost exclusively addressed herself to the teacher and occasionally to an aide. At this point, she was talking with the other children and usually pairing off with another girl to play or participate in an activity.

Although Sally's behavior at school was much better than at home during the observation period, there was not the marked difference observed during baseline₁. Home M=260.8, 10 sec. intervals of undesirable behavior; school, 21.6. At school Sally was languid and even drowsy. The teacher commented that this was very unusual.

The last day of baseline₁ in the home Patterson & Gullion (1968) was left with Sally's parents to read.

At the beginning of instruction-conditioning₁ this family developed some personal problems, and during one week E made three visits when either no one was home or a baby sitter was with the children.
Sally's father read Patterson and Gullion (1968), and in the discussions suggested some corrections they might make in coping with the children. Her mother didn't appear to have read the book; although she said she had, and she never kept a record of Sally's quiet times as requested. She always said, "She's never quiet," or "She was pretty good."

The following instructions evolved from the discussions with the parents:
1) Be aware when Sally is quiet.
2) Give her your attention when she is quiet, a pat on the head, a kiss on the cheek or talk to her.
3) Do not talk about her being active or the undesirable things she does. Ignore activity that is not destructive or harmful.
4) Give her crayons or pencil and paper, scissors and paste or any quiet activity and sit her at the table and take a moment to get her started, then every few minutes praise or comment on what she is doing.
5) Find a place in the home where the results of her quiet activities can be displayed.

The father was not home or was working on a car in the backyard except for the first two visits during the instruction-conditioning period. Instructions to the mother explained and stressed shaping and immediate reinforcement. Sally had appeared responsive to attention, particularly her mother's, so even though primary reinforcements were discussed, it was decided attention would be adequately reinforcing for Sally. Sally's mother continued to talk about Sally's hyperactivity,
and E could not observe any change in her treatment of the child. In some instances E pointed out to the mother that Sally had behaved appropriately and encouraged her to praise her. The mother seemed to find this very difficult to do.

Crayons, pencils and writing paper did appear in the home, and Sally was using them. The mother reported that Sally had used the crayons on the wall in her bedroom. It was suggested that use of the crayons might be restricted to the table so the child would be in view when using them and better located to receive positive attention for her work with them.

The instruction-conditioning period was 35 days with six instruction visits and five count visits in the home and five in the school. By the first week in June it was necessary to start the post instruction-conditioning count because the preschool class would end June 16. The post instruction-conditioning measurement was made in 5, 1 hr. sessions, between June 6 and 13 in both the home and school. The mean 1 hr. frequency in 10 sec. intervals of undesirable behavior in the home was 61.2; in the school, 42.4.

The change between baseline (M=260.8) and the post instruction-conditioning count in the home (M=61.2) supports contingency changes in the home, but observation indicated they did not include a change in the interaction between mother and child. This family, and the visiting family members, appeared to have many problems, and at times, E thought that Sally's hyperactivity had low priority. At the beginning of instruction-conditioning, Sally's father and uncle, the maternal uncle
who was then staying with them, were arrested, and when E arrived at the home, the mother had been up all night trying to get them released. This trouble including the court appearance took about a week, and added to the family's financial problems. Later, still during this period, the mother's sister and brother-in-law were arrested, and the mother had gone out of town over the weekend to help get her sister out of jail. E was visiting the home during these incidents because the phone had been disconnected, and it was not possible to confirm whether or not the parents were available for instruction.

Starting June 14, a reversal contingency period was started during which the parents were asked to return to baseline\textsubscript{1} conditions in the home. At the end of the 9 day contingency reversal period, the baseline\textsubscript{2} count was taken in the home. Five, 1 hr. counts were made during June 20, 21 and 22. M=58.2, 10 sec. intervals of undesirable behavior.

A review of behavior modification procedures previously covered was given the mother. The instructions written for instruction-conditioning\textsubscript{1} were repeated. Sally's mother appeared more receptive during these discussions. The post instruction-conditioning\textsubscript{2} counts were done June 26, 27 and 28. Suddenly during these counts, Sally's mother began to verbalize that Sally's behavior had improved, and her attitude was warmer toward Sally. She said they did not want to have to continue Sally on the medication when she was in kindergarten. They planned to discontinue the medication gradually during the next week and use behavior modification in an effort to control her hyperactivity without medication by fall. E agreed to continue visiting them occasionally during the summer to aid in their program. Post instruction-conditioning\textsubscript{2} M=41.4, 10 sec. intervals of undesirable behavior.
Fig. 2. The frequency in 10 sec. intervals of Sally's (S2) undesirable behaviors measured during 5, 1 hr. irregularly scheduled sessions in the home (solid line) and in the school (broken line). Baseline1 -- before experimental procedures. Post instruction-conditioning1 -- after Sally's parents were trained in and used behavior modification techniques to change Sally's undesirable behaviors in the home. Baseline2 -- reinstatement of baseline1 contingencies in the home. Post instruction-conditioning2 -- reinstatement of instruction-conditioning contingencies in the home. M is the mean frequency in 10 sec. intervals for each 5 hr. measurement period.
Subject Three

Bill was in the same Ceres preschool class as Sally, and he was four in February 1972. He also was a middle child with a sister 7 yrs. old and a brother 2 yrs. old. At school one day when stopped from running to the bus and directed to walk, he threw himself on the ground and had to be carried to the bus. The teacher had a conference with the step-father who cared for the children during the day when the mother was working, and found the family had been having problems with Bill the last three months.

A conference with Bill's mother established that she and her husband were extremely concerned about how to cope with Bill's behavior problems, and they were interested in participating in the experiment.

Two hours of observation in the home and school isolated the following behaviors:

1) Stubborn refusal to follow instructions. He said "no" or "I won't" or "Why?" When told why, often he replied, "So what?"

2) Pouting and withdrawing from the group at school and sulking at home.

3) Seeking attention at home by pretending to do something forbidden and at school requesting help from the teacher or aides to do something he was able to accomplish for himself.

Bill's mother repeated the same instruction over and over, and Bill ignored such instructions until the mother became emphatic, and then he would often flatly refuse to obey or stalled. His mother maintained a very friendly manner even when there was a disagreement. The step-father gave many orders to the three children and said they
"didn't mind." He became particularly irritated with Bill and shouted at and threatened him.

The school bus driver had complained that Bill insisted on opening the windows when told to leave them closed and stood when told to sit on the bus.

At school Bill showed the same refusal to follow a direct instruction. Class instructions were generally obeyed, but occasionally Bill held back and if an aide or the teacher insisted, he would firmly refuse. Often his reluctance to follow some class instructions was ignored, and he would then generally participate. Occasionally he withdrew to a corner and played alone.

The observations, counts and instructions were done when Bill's mother was home from work in the late afternoons, evenings or on Saturdays. The mother was working long days during baseline and some of the home measurements had to wait from Saturday to Saturday; thus the baseline period was relatively long, May 4 to May 25. A notebook was given the parents during baseline, and they were requested to record the episodes of Bill's stubborn refusal and to record what action they took. The home baseline measurement had a 1 hr, frequency mean of 54.8, 10 sec. intervals of undesirable behavior; school, 20.6.

Both parents read Patterson & Gullion (1968). They immediately began to apply what they read. However, they never kept a record as requested.

The following guidelines evolved early in the instruction-condition period:

1) Use "time out" for stubborn refusal to follow instructions. Send
Bill to his room to remain there for 3 min. after he has quit crying, and he agrees to carry out the instruction.

2) Give him special attention and praise when he does follow an instruction. Be aware that this may pertain to small matters such as setting a glass on the sink or washing the jelly from his hands.

3) Ignore teasing threats to do what has been forbidden.

4) Consider carefully what actions are important and give only instructions pertaining to them so that orders are not being issued constantly.

This family adopted the behavior modification technique very quickly and reported they received immediate results. After using "time out" only three times, the parents said Bill's stubborn refusals almost disappeared. Bill's mother used positive reinforcement effectively with Bill by praising him directly and to the step-father when he responded immediately to her requests. On June 1, the mother said they visited the grandparents, and the grandparents commented on Bill's "improved behavior."

The parents were enthusiastic and wanted to extend the technique to other behaviors of Bill's and to the other children. Bill's mother said getting him to dress took all morning. She made watching TV contingent on his being dressed by 9 A.M. which she identified for him by the TV program at that hour. He subsequently never missed the TV program.

Three neighbor boys were often at Bill's home playing outside with him and his 2 yr. old brother. Bill's parents said verbal dis-
agreements and fights arose often and asked how they could use behavior modification. It was suggested they become aware when the boys were playing without problems and reward them all with cookies or crackers and praise them for getting along together. It was explained that the rewards could gradually become spaced so that they were only used occasionally to support the desired behavior, and that the praise and attention were to replace the primary reinforcers. This program proved very successful, and the neighbor boys' mother became interested in learning behavior modification techniques, particularly for one of the boys whom she considered hyperactive. The post instruction-conditioning\textsubscript{1} count was taken in Bill's home and school June 7 through 14, and the home $M=7.6$, 10 sec. intervals of undesirable behavior; school, 13.0.

Bill's parents were asked to start June 14 a reversal contingency period. They were willing to try, they said, but thought it would be difficult. Baseline\textsubscript{2} was taken in the home June 19 through 22. The mean was 18.4, 10 sec. intervals of undesirable behavior.

The principles of behavior modification were reviewed with Bill's parents, and they were glad to return to instruction-conditioning procedures. Bill's mother was now using behavior modification to toilet train the 2 yr. old, and she had started a star chart with a money payoff for the 7 yr. old daughter to encourage her to make her room neat each morning. The post instruction-conditioning\textsubscript{2} count was taken in Bill's home June 27 through June 30. The mean was 8.8, 10 sec. intervals of undesirable behavior.
Fig. 3. The frequency in 10 sec. intervals of Bill's (S3) undesirable behaviors measured during 5, 1 hr. irregularly scheduled sessions in the home (solid line) and in the school (broken line). Baseline1 -- before experimental procedures. Post instruction-conditioning1 -- after Bill's parents were trained in and used behavior modification techniques to change Bill's undesirable behaviors in the home. Baseline2 -- reinstatement of baseline1 contingencies in the home. Post instruction-conditioning2 -- reinstatement of instruction-conditioning1 contingencies in the home. M is the mean frequency in 10 sec. intervals for each 5 hr. measurement period.
Results

There were two a priori predictions in this experiment. The first was that the frequency of undesirable behaviors of the children in the homes would decrease following the training in and use of behavior modification techniques by the parents of Sally and Bill and the mother of Lottie. The second was that not only would the frequency of undesirable behaviors in the homes decrease after the use of behavior modification techniques, but that the discontinuance of the techniques would cause an increase in the frequency of the undesirable behaviors in the homes. Generalization, frequency reduction of undesirable behaviors in the homes would also result in frequency reduction of the undesirable behaviors in the schools, was investigated.

The dependent variable was the frequency of specified undesirable behaviors of each child in the home and school. The frequency of the undesirable behaviors was counted in 10 sec. intervals for 5, irregularly scheduled 1 hr. sessions for each measurement for each child. There was a total of six, 5 hr. counts per child, four in the home and two in the school. The frequency in 10 sec. intervals of undesirable behaviors for each child, for each 5 hr. measurement, was summed and divided by five to find the mean (M) frequency per hour in 10 sec. intervals of the undesirable behaviors. See Table 1 for these means.

Instruction-conditioning occurred only in the homes. Variable A was the instruction-conditioning in the homes and the six levels of variable A were:

HOME: Baseline, Instruction-conditioning, Baseline,
Instruction-conditioning, Baseline,
Instruction-conditioning,

SCHOOL: Baseline, Instruction-conditioning,
Table 1. Mean Frequency Per Hr. of Undesirable Behaviors in 10 Sec. Intervals for 5 Irregularly Scheduled, 1 Hr. Sessions, in the Homes and Schools of 3 Subjects.

<table>
<thead>
<tr>
<th>HOME</th>
<th>Lottie (S₁)</th>
<th>Sally (S₂)</th>
<th>Bill (S₃)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline₁</td>
<td>58.8</td>
<td>260.8</td>
<td>54.8</td>
</tr>
<tr>
<td>Instruction-Conditioning₁</td>
<td>19.0</td>
<td>61.2</td>
<td>7.6</td>
</tr>
<tr>
<td>Baseline₂</td>
<td>29.8</td>
<td>58.2</td>
<td>18.4</td>
</tr>
<tr>
<td>Instruction-Conditioning₂</td>
<td>8.8</td>
<td>41.4</td>
<td>8.8</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SCHOOL</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline₁</td>
<td>31.8</td>
<td>21.6</td>
<td>20.6</td>
</tr>
<tr>
<td>Instruction-Conditioning₁</td>
<td>19.8</td>
<td>42.2</td>
<td>15.0</td>
</tr>
</tbody>
</table>

The data for the three subjects was combined, and changes in the homes were tested by the analysis of variance (ANOVA) for a randomized block factorial (RBF-pq) design (Kirk, 1968) at a significance level of .05. The four levels of A in the homes were used in this analysis, and variable B was the hours in which the measurements were taken. The summary of the analysis is presented in Table 2.

Table 2. Analysis of Variance on Combined Data of 3 Subjects. Data was the Frequency of Specified Undesirable Behaviors of 3 Children in Their Homes. Variable A Is the Instruction-Conditioning in the Homes. Variable B Is the Hours Counts Were Made.

<table>
<thead>
<tr>
<th>SOURCE</th>
<th>SS</th>
<th>DF</th>
<th>MS</th>
<th>N/D**</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Blocks</td>
<td>84,930</td>
<td>2</td>
<td>42,465</td>
<td>1/7</td>
<td>71.13*</td>
</tr>
<tr>
<td>2 A</td>
<td>107,091</td>
<td>3</td>
<td>35,697</td>
<td>2/6</td>
<td>3.08</td>
</tr>
<tr>
<td>3 B</td>
<td>1,621</td>
<td>4</td>
<td>405</td>
<td>3/5</td>
<td>.04</td>
</tr>
<tr>
<td>4 AB</td>
<td>9,746</td>
<td>12</td>
<td>812</td>
<td>4/7</td>
<td>1.36</td>
</tr>
<tr>
<td>5 BxS</td>
<td>8,940</td>
<td>8</td>
<td>1,118</td>
<td>5/7</td>
<td>1.87</td>
</tr>
<tr>
<td>6 AxS</td>
<td>69,502</td>
<td>6</td>
<td>11,584</td>
<td>6/7</td>
<td>19.40*</td>
</tr>
<tr>
<td>7 ABxS</td>
<td>14,334</td>
<td>24</td>
<td>597</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>296,164</td>
<td>59</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*p < .01
**Line numbers of mean squares (MS) used as numerators and denominators for F ratio.
All subject sources of variance, $AxS$, $BxS$, and $ABxS$ were tested for pooling at alpha \(0.25\) and were significant, and thus not pooled. The linear model underlying the ANOVA is:

\[
X_{ijm} = \mu + \alpha_i + \beta_j + \gamma_{ij} + \pi_m + \epsilon_{ijm}
\]

An analysis for cubic trend (Kirk, 1968) in the data collected in the homes was made to test at alpha equals \(0.05\) the second a priori prediction that the frequency of undesirable behaviors in the homes would decrease after behavior modification techniques were learned and applied in the homes and increase when behavior modification techniques were discontinued in the homes. The frequency of undesirable behaviors in the homes was expected to decrease following instruction-conditioning in the homes, that is, between baseline\(_1\) and post instruction-conditioning\(_1\) measurements. The frequency of undesirable behaviors was expected to increase during the reversal contingency period measured at baseline\(_2\). Reinstatement of behavior modification techniques in the homes during instruction-conditioning\(_2\) was expected to again reduce the frequency of undesirable behaviors. The analysis for cubic trend was significant at alpha equals \(0.05\), and supported the a priori prediction.

The home and school data, combined for the three subjects, was tested by ANOVA for a RBF-pqr design (Kirk, 1968) at alpha \(0.05\). The levels of variable A were baseline\(_1\) and instruction-conditioning\(_1\) in the homes and baseline\(_1\) and instruction-conditioning\(_1\) in the schools. Variable B was the hours in which the measurements were taken, and C was the location variable, home and school. The subject sources and two interaction sources, $AB$ and $BC$, were tested for pooling at alpha equals \(0.25\). The ANOVA summary before pooling is shown in Table 3.

<table>
<thead>
<tr>
<th>SOURCE</th>
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</thead>
<tbody>
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<td>31,038</td>
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<tr>
<td>Treatments</td>
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<td></td>
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</tr>
<tr>
<td>A</td>
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<td>1</td>
<td>34,177</td>
</tr>
<tr>
<td>B</td>
<td>826</td>
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</tr>
<tr>
<td>C</td>
<td>41,123</td>
<td>1</td>
<td>41,123</td>
</tr>
<tr>
<td>AC</td>
<td>34,231</td>
<td>1</td>
<td>34,231</td>
</tr>
<tr>
<td>AB</td>
<td>4,998</td>
<td>4</td>
<td>1,250</td>
</tr>
<tr>
<td>BC</td>
<td>2,584</td>
<td>4</td>
<td>646*</td>
</tr>
<tr>
<td>ABC</td>
<td>1,993</td>
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<td>498*</td>
</tr>
<tr>
<td>Residual</td>
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</tr>
<tr>
<td>AxS</td>
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<td>6,876</td>
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<tr>
<td>BxS</td>
<td>6,494</td>
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<td>812*</td>
</tr>
<tr>
<td>CxS</td>
<td>45,033</td>
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<td>22,516</td>
</tr>
<tr>
<td>ABxS</td>
<td>1,925</td>
<td>8</td>
<td>241*</td>
</tr>
<tr>
<td>ACxS</td>
<td>28,455</td>
<td>2</td>
<td>14,228</td>
</tr>
<tr>
<td>BCxS</td>
<td>4,313</td>
<td>8</td>
<td>539*</td>
</tr>
<tr>
<td>ABCxS</td>
<td>3,359</td>
<td>8</td>
<td>420*</td>
</tr>
</tbody>
</table>

*Can be pooled.

The ANOVA summary after pooling is shown in Table 4.

Table 4. Analysis of Variance After Pooling on Combined Data of 3 Subjects. Data Was the Frequency of Specified Undesirable Behaviors of 3 Children in Their Homes and in Their Schools. Variable A Is the Instruction-Conditioning. Variable B Is the Hours Counts Were Made, and Variable C Is the Location, Home and School.

<table>
<thead>
<tr>
<th>SOURCE</th>
<th>SS</th>
<th>DF</th>
<th>MS</th>
<th>N/D**</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Blocks</td>
<td>62,077</td>
<td>2</td>
<td>31,038</td>
<td>1/10</td>
<td>70.06*</td>
</tr>
<tr>
<td>2 A</td>
<td>34,177</td>
<td>1</td>
<td>34,177</td>
<td>2/7</td>
<td>4.97</td>
</tr>
<tr>
<td>3 B</td>
<td>826</td>
<td>4</td>
<td>206</td>
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<td>.40</td>
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<tr>
<td>4 C</td>
<td>41,123</td>
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<td>1.82</td>
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<td>5 AC</td>
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<td>34,231</td>
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<td>2.40</td>
</tr>
<tr>
<td>6 AB</td>
<td>4,998</td>
<td>4</td>
<td>1,250</td>
<td>6/10</td>
<td>2.42</td>
</tr>
<tr>
<td>7 AxS</td>
<td>13,751</td>
<td>2</td>
<td>6,876</td>
<td>7/10</td>
<td>13.30*</td>
</tr>
<tr>
<td>8 CxS</td>
<td>45,033</td>
<td>2</td>
<td>22,516</td>
<td>8/10</td>
<td>43.55*</td>
</tr>
<tr>
<td>9 ACxS</td>
<td>28,455</td>
<td>2</td>
<td>14,228</td>
<td>9/10</td>
<td>27.52*</td>
</tr>
<tr>
<td>10 Residual</td>
<td>20,668</td>
<td>40</td>
<td>517</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*p < .01

**Line numbers of Mean Squares (MS) used as numerators and denominators for F ratio.
The linear model underlying the ANOVA after pooling is:

$$X_{ijkm} = \mu + \alpha_i + \beta_j + \gamma_k + \alpha_{ij} + \alpha_{ik} + \alpha_{im} + \alpha_{jm} + \gamma_{km} + \gamma_{km} + \alpha \gamma_{ikm} + \beta \gamma_{ijkm} + \epsilon.$$  

**Discussion**

Table 1 showing a decrease in the mean per hour frequency of undesirable behaviors in the homes by the three subjects from baseline counts to instruction-conditioning counts and the significant cubic trend in the data supported the experimental hypothesis. The experimental hypothesis was that the parents of Sally and Bill and the mother of Lottie could be trained in behavior modification techniques and could use these techniques to reduce the undesirable behaviors of their children in their homes.

The ANOVA of the data collected in the homes did not support the experimental hypothesis. There were significant subject effects, and the differences between the subjects might have masked the treatment effects in the ANOVA. In order to utilize the power of the ANOVA statistic in this experiment, the number of subjects could be increased. This, of course, brings with it additional time and scheduling problems since instruction in the homes is a major part of the design. A change that might be made in this experiment without increasing the number of subjects would be to select subjects with a single, similar behavior problem to be modified, i.e. hyperactivity or stubborn refusal to follow instructions, and whose rate of frequency of the behavior is comparable at baseline. The range of frequency means in the present
experiment was 54.8, 10 sec, intervals of undesirable behaviors per hour, to 260.8, 10 sec, intervals of undesirable behavior per hour, which indicates great subject variability.

Whether or not generalization from the home setting to the school setting occurred is not clear in the present experiment. The ANOVA of the home and school data did not have a significant location variable (C) at alpha .05 so that analysis gave no support to generalization. In the data there was a minimal indication that a change in the home resulted in a change in the school behavior, but again subject variability clouded the interpretation. After instruction-conditioning in the home, Lottie and Bill had a reduction of undesirable behaviors in the school and Sally an increase. Even though Sally's baseline in the school seemed to include an unexplained variable, possibly adjustment to regular medication or excessive aggressive play with guests in the home, there was no way to isolate it. An increase in the baseline period and additional counts within the period might alleviate this difficulty and strengthen the study.

An experimental design that does not use contingency reversal to show a relationship between the use of behavior modification techniques and changes in behavior might be better. Lottie's mother and the parents of Sally and Bill were reluctant to reverse the contingencies in their homes. Bill's mother wondered if it was "good for the boy," and Lottie's mother didn't want Lottie behaving as she had during baseline. Sally's parents voiced no opposition to the contingency reversal request, but Sally's baseline measurement was lower than the instruction-conditioning measurement which indicates the parents were not successful in returning
to baseline conditions in their home. An experimental and control group design might be better if a large enough sample is available.

Using the combination of home visits and the consultant technique to train parents in behavior modification to change the undesirable behaviors of their children has some disadvantages and advantages.

The major disadvantages are the initial time investment needed for families to adjust to the consultant in the home and the problems of scheduling. An hour here and there does not allow the family to adjust adequately to the consultant's presence for normal child-parent and parent-parent interactions to occur. It appeared to E that at least 4-6 hrs. concentrated in no more than a week is necessary before the behaviors even approach their normal pattern. Working parents make it necessary to schedule visits in the evenings and on Saturdays. Another disadvantage to the combination of in-the-home training and the consultant technique is the time wasted on unkept appointments. This could be more of a problem of an experiment where subjects are selected to fit the experiment than it would be if a fee were being charged or if the consultations were immediate responses to requests for help. Cooperation in meeting requests such as the request to keep records would more likely be forthcoming too if a fee were being paid.

In-the-home training, once the parent and child are interacting normally, can be very quick. Directing Lottie's mother how to cope with Lottie's undesirable behavior right at the time it was occurring resulted in immediate modification of both parent and child behavior. And it seems doubtful that without spending time in Sally's home the
mother's attitude toward the child would have become apparent. Nor would the need to specifically call the mother's attention to Sally's quiet and desirable behavior when it occurred have been met.

In-the-home observation and consultation can give the consultant first-hand information about the parent-to-parent interaction and other environmental factors such as the continual visitors in Sally's home and family problems that might affect the parent-child relationship and thus the child's behavior.
REFERENCES

Allen, K.E. & Harris, F.R. Elimination of a child's excessive scratching by training the mother in reinforcement procedures. Behavior Research & Therapy, 1966, 4, 79-84.


Hall, Vance R.; Axelrod, Saul; Tyler, Lucille; Grief, Ellen; Jones, Fowler C.; Robertson, Roberta. Modification of behavior problems in the home with a parent as observer and experimenter. Journal of Applied Behavior Analysis, 1972, 5, 53-64.


### Appendix A

#### BEHAVIOR COUNT

<table>
<thead>
<tr>
<th>Name</th>
<th>LOTTIE S1</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Location</td>
</tr>
<tr>
<td></td>
<td>HOME</td>
</tr>
<tr>
<td>Date</td>
<td>Code</td>
</tr>
<tr>
<td>6/20</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>3</td>
</tr>
<tr>
<td>6/21</td>
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</tr>
<tr>
<td></td>
<td>1</td>
</tr>
<tr>
<td>6/22</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>2</td>
</tr>
</tbody>
</table>

### Description of behavior and code key:

1. Failure to follow instructions or suggestions, argumentative, and verbally abusive.

2. Attention seeking.

3. Disturbing
Appendix B

BEHAVIOR MODIFICATION PROGRAM FOR BED WETTING SUGGESTED FOR LOTTIE

1) When Lottie expresses a desire for a particular object, tell her she can earn it by keeping her bed dry at night.

2) Set the number of nights she needs to be dry to earn the object. Make this only about ten for the first time. The actual cost of the object and the amount she earns do not have to be relative. Each night place a nickel in a particular place and explain to Lottie if she does not wet the bed that night, she will get the nickel in the morning, and when she has ten nickels, she can have the object she is wanting.

3) The mornings she is dry give her the nickel and praise her. If she is not dry, do not give her the nickel, but tell her she can earn it the next night. Do not scold her or complain that she has wet.

4) When she has almost enough nickels to get the object, take her shopping so it is in the home to be given to her immediately when she earns the last nickel.

5) In the meantime, be on the lookout for other objects she can earn. After she has earned a couple of things by being dry ten nights, gradually increase the "cost" of the object so that she must be dry more nights to earn what she wants. Eventually the number of nights she must be dry to earn one nickel can be increased. Much praise each time she is successful in staying dry and no attention for her failures should make it possible to later discontinue the material payoffs.
During a follow-up telephone call in September, Lottie's mother told E they were still "working on the problem," and that Lottie was still collecting her nickels. Unfortunately, Lottie still receives attention for wetting the bed. Her step-father complains. Relatives are aware of the problem, discuss it, and volunteer additional rewards to Lottie.