BEHAVIOR MODIFICATION WITH CULTURALLY DEPRIVED SCHOOL CHILDREN: TWO CASE STUDIES¹

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Techniques of behavior modification were employed with two second-grade Negro girls in a demonstration school for culturally deprived children to increase the girls' appropriate classroom behaviors. A classification system that provided for continuous categorization of behavior was used to code the children's behavior in two classroom situations. Data were also taken on the type, duration, and frequency of the teachers' verbal interactions. The study included four conditions: Baseline, Modification I, Postmodification, and Modification II. The treatment variable was positive social reinforcement—attention and approval contingent upon desirable classroom behaviors—which was presented, withheld, or withdrawn (timeout from social reinforcement). Withholding of social reinforcement was contingent upon inappropriate attention-getting behaviors. Timeout from social reinforcement was contingent upon behaviors classified as aggressive and resistive. After 25 days of Modification I, desirable behavior increased markedly for each girl. The teachers were then asked to return to their Baseline level of performance. The resultant behaviors demonstrated that for one girl, behavior was still primarily under the control of the treatment contingencies. For the second child, many desirable behaviors that had increased in frequency during Modification I remained high, but inappropriate behaviors increased. When treatment was reinstated, the amount of time spent in desirable behaviors increased and remained high for both girls. Three checks during the three months following data collection showed that these behaviors continued to remain high.

Within a classroom setting, disruptive behaviors can prevent a child from making maximum use of school time. Culturally deprived children are already at an academic disadvantage when they begin school, and when these children demonstrate aggressive, anti-social, or resistive behaviors, they become even further handicapped.

In attempting to alter a child's classroom behaviors, it is not as pertinent to question the development of these behaviors as it is to recognize that the behaviors can be maintained by the existing environment. A child's

environment includes a variety of rewards and punishments. For many children, the attention of an adult can be a rewarding consequence, that is, social reinforcement. Within a classroom setting, contingent social reinforcement from a teacher has been effectively used to modify children's behaviors. Nursery school teachers have been used as social reinforcers for altering such maladaptive responses in children as isolate behaviors (Allen, Hart, Buell, Harris, and Wolf, 1964), regressed crawling (Harris, Johnston, Kelley, and Wolf, 1964), and crying (Hart, Allen, Buell, Harris, and Wolf, 1964).

Work with culturally deprived children has shown that they respond to the same contingencies that have been shown to operate with other children. To date, several successful behavior modification studies employing a teacher as a social reinforcer have been carried out with deprived children (Hall, Lund, and Jackson, 1968). Other examples of the training of teachers in behavior modification techniques are seen in the work of Zimmerman and Zimmerman (1962), O'Leary and Becker

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(1967), and Wolf, Birnbrauer, Williams, and Lawler (1965).

It is still, however, relatively rare for the application of behavior modification techniques to take place on a systematic level in a primary classroom. The present study sought to increase the appropriate classroom behavior and decrease the inappropriate and unacceptable behavior of two Negro girls by introducing the techniques of behavior modification in a second grade classroom. A second purpose was to attempt a comprehensive study of the behavior of the teachers who were instrumental in carrying out the modification procedure. An additional purpose was to utilize an inclusive classification system to record the continuous behavior of a child (Spaulding, 1967) as contrasted with recording only one defined behavior of a child.

METHOD

Subjects

The two children in this study were in a demonstration school for culturally deprived children. The classroom organization included two teachers and 20 children, 12 white and 8 Negro. Dianne was a 7-yr-old Negro girl who tested in the average range on the Wechsler Intelligence Test for Children. Informal observation of her behavior during the first three weeks of school made it apparent that she was a severe problem in the classroom. On some days, over 90% of her class time was spent in disruptive activities. During Baseline she was observed in the following behaviors: continuing one activity when the class had been given directions for another, throwing a basketball at the ceiling, going about the room pulling workbooks away from other children, and running around the room and out into the hall. When limits were set upon the class as a whole, she would laughingly break them. Dianne's verbal and physical aggressiveness toward other children had reached the point where other children requested not to sit by her in the classroom.

The second subject was Jane, a 7-yr-old Negro girl, who tested in the average intelligence range on the Wechsler Intelligence Test for Children. She engaged in many behaviors that were disruptive to the class and were difficult for the teachers to handle. Whenever she was given direction by a teacher, her usual

responses were: "I won't" and "I ain't". When called to a small group, she would continue her ongoing activity. If the teacher insisted upon appropriate behavior, she would strike at and kick the teacher. The typical recourse at this point was to let her do whatever she wanted while the rest of the class continued with their assignments.

Although the teachers had expected disruptive and inappropriate behaviors in a classroom of culturally deprived children, they reported that they were unable to alter the behavior of these two girls and requested assistance. At this point, informal observations were made of the behavior both of the children and of the two teachers. After several days, a decision was made that these two girls might benefit from a behavior modification program, and the procedure for data collection was arranged.

Recording Procedure

A modified version of the Coping Analysis Schedule for Educational Settings (CASES) (Spaulding, 1967) was used to code the children's behavior in two class situations. This modified version is presented in Table 1.

The various behavior categories were classified under three different subdivisions: *desirable*, *inappropriate*, and *unacceptable*. The assignment of behaviors to the subdivisions was based upon the teachers' goals for the children's classroom behavior. The behaviors listed under desirable were those the teachers wanted increased or maintained at a high level. Those behaviors listed under inappropriate and unacceptable were those the teachers wanted decreased. Inappropriate behaviors were primarily those desirable behaviors that were performed at the wrong time or place, while the unacceptable behaviors were never desirable in a classroom setting.

The teachers' verbal interactions are presented in Table 2. These interactions were divided into five categories which were selected to study the consequences of the type of teacher attention on a child's behavior. Only the interactions of the teachers that occurred with the children in the study were recorded. Data on the teachers were taken at the same time data on the children were coded. Data were collected continuously on a standard 20-pen event recorder connected to a 20-button microswitch panel. Only one event

Table 1

A Modified Version of the Coping Analysis Schedule for Educational Setting¹**DESIRABLE**

- 3a. *Manipulating and Directing Others*: Manipulating, commanding, or directing others appropriately; enforcing rules.
- 5a. *Self-Directed Activity*: Working independently, such as reading, writing, or constructing; continuing to work in the absence of immediate supervision.
- 7a. *Sharing and Helping*: Contributing ideas, interests, materials; helping others; initiating conversation.
- 8a. *Social Interaction*: Cooperative behavior, such as talking, studying, or playing with a peer.
- 9a. *Seeking Support, Assistance, and Information*: Asking teachers or peers for help, support, direction, or explanation.
- 10. *Following Directions Passively and Submissively*: Following requests, answering direct questions, working only with teacher supervision.

INAPPROPRIATE

- 4a. *Resisting Authority*: More than a 10-sec delay in carrying out teacher's directions.
- 11. *Observing Passively*: Watching others work, "checking on" activities of adults or peers.
- 3b, 7b, 8b, and 9b. These categories have the same definitions as those with corresponding numbers under the *Desirable* heading, but are coded as inappropriate when they occur at other than the appropriate time or place.

UNACCEPTABLE

- 1. *Aggressive Behavior*: Direct attack on a child or teacher—grabbing, pushing, hitting, pulling, kicking, name-calling; destroying property.
- 2. *Inappropriate Behavior—Getting Behavior*: Activities which seem to result in attention from others such as annoying, bothering, belittling, or criticizing others; noise-making or loud talking.
- 4b. *Resisting Authority*: Physically resisting instructions or directions, for example—saying "I won't do it" and leaving the room.

¹Spaulding, Robert L. *An Introduction to the Use of the Coping Analysis Schedule for Educational Settings (CASES)*.

recorder was available; therefore, the behavior of one child and one teacher was coded at a time. Ten pens were used to record the child's behavior, five pens were used to record a teacher's interactions with the child, and one pen was used to denote time in isolation. Each pen was used to denote two separate behaviors. When the button was depressed and held down, one behavior was denoted, and when the button was rapidly deflected twice in succession before being held down, a second behavior was denoted.

When the behavior of a teacher or a child was in a particular category, the appropriate pen was deflected and remained down until the behavior changed. Since paper was continuously moving through the recorder at a set speed, it was possible to obtain both a duration and a frequency count of the recorded behaviors and to look at the behavior category of the child when a teacher interacted with her.

The two observers were trained within two weeks to record data on both classification

Table 2
Classification of Teacher's Verbal Interactions

1. Positive	Any verbalization which encourages or approves of the behavior of a child, e.g., "That's good." "You are doing fine."
2. Neutral	Any statement related to academic work which explains, describes, directs, instructs, or sets limits for a child, e.g., "Complete pages 6 and 7 in your reading book." "You may go to the library for thirty minutes."
3. Question	Any interrogative sentence in which the teacher asks for academic information only, e.g., "What is the answer to this problem?"
4. Redirection	Any statement with which the teacher attempts to redirect a child from an inappropriate behavior to an appropriate behavior, e.g., "You are supposed to be reading instead of coloring."
5. Negative	Any statement that disapproves of a child's behavior. It may be defined by negative content or strong emphasis in speaking, e.g., "Stop that!" "Don't do that."

systems. After they were given information on the two category systems and recording procedures, they coded behavior in the classroom. Next they obtained estimates of inter-observer reliability. The disagreements were discussed and the process repeated until the observers demonstrated a high degree of inter-observer agreement. Because two event recorders were not available, reliability estimates between observers were collected by a paper and pencil procedure, which consisted of recording, at 10-sec intervals, the child's behavior or the teacher's interactions for a 10-min period. The reliability coefficients were percentages of agreement between the two observers (reliability = total number of agreements/total number of observations $\times$ 100). Four inter-observer reliability estimates, when obtained for all CASES categories simultaneously, ranged from 80 to 100%. Four reliability estimates obtained separately for coding data by each subdivision—desirable, inappropriate, and unacceptable—ranged from 90 to 92 to 100% in each case. Four reliability estimates established for each teacher interaction ranged as follows: positive, 80 to 100%; neutral, 84 to 96%; question, 75 to 90%; redirect, 80 to 100%; negative, 90 to 100%.

Experimental Conditions

The two studies each consisted of four conditions: (1) Baseline, (2) Modification I, (3) Postmodification, and (4) Modification II. When one of the four conditions was in effect, the procedures were carried out throughout the school day, but data were collected only during two small-group activities: a morning reading group and an afternoon math group. Twenty minutes of data were collected on each child in each activity. Teacher A conducted both reading and math groups for Dianne. Jane had Teacher A for reading and Teacher B for math.

Baseline

For 10 days, data were collected to assess the nature and frequency of the children's behaviors and to ascertain what the teachers' interactions were with these children. During this time, the teachers saw the day-by-day graphs of only the children's behavior. The teacher's recorded interactions with the children were not discussed until after the last day of Baseline.

Modification I

In this condition, training of the teachers in behavior modification principles was initiated. Prior to this time, each teacher had received only a brief introduction to behavior modification. The teachers were instructed to structure clearly and carefully those behaviors required of the children and to be consistent and immediate when responding to a child.

Three treatment variables were made contingent upon the children's behaviors. These variables were: (1) social reinforcement (praise, attention, and teacher proximity), (2) withholding of social reinforcement and, (3) time-out from social reinforcement or social isolation. Social reinforcement from the teachers was contingent upon desirable classroom behaviors. Whenever a child exhibited desirable behavior, the teachers were to praise and express approval of her behavior (*i.e.*, "You are doing very well!"). They were also to give the child attention by asking questions and describing and explaining work.

Whenever a child's behavior either was in an inappropriate category or was classified as inappropriate attention-getting behavior (see Table 1), the teacher was instructed to withhold a social reinforcement by turning away from the child.

Because not all inappropriate behaviors appeared to be maintained by a teacher's attention, the teacher was instructed to redirect a child for certain inappropriate behaviors. For example, if a child had been working and then started talking with another child, the teacher would redirect him as follows: "You are supposed to be . . ." The teacher was not to argue with or challenge the child.

Removing the child from the room, social isolation, was contingent upon the aggressive or resistive behaviors (see Table 1). Whenever a child's behavior met the criteria for social isolation, she was first verbally redirected to an appropriate behavior. If she continued to behave unacceptably, she was then warned: "You are not supposed to be doing You are supposed to be doing If you do not change, you will have to be taken to the quiet room." The teacher then turned from the child for 15 sec to allow her to make a change. At the end of the 15 sec, the child was taken to isolation only if she had not made any definite move to begin the structured activity

and to terminate the unacceptable one. However, when aggressive acts occurred for which the child had already been warned, the warning was omitted and the consequence simply applied. When a child was taken to the quiet room she was told she had not been doing what she had been instructed to do. The isolation room was carpeted and well lighted. The child remained in the room for 5 min; no activities were provided for the child during this time.

The criterion for ending Modification I was five consecutive days in which desirable behavior exceeded 75% and averaged 90%.

Postmodification

When the classroom behavior of both girls reached criterion level, the teachers were asked to return to their Baseline performance. Specifically, the following directions were given to the teachers: (1) Praise and attention could be given but with no emphasis on immediacy or consistency. (2) The teachers were to ignore aggressive and resistive behaviors when the child did not immediately respond to redirection by the teacher. (3) Isolation from the classroom by means of the quiet room was not to be used. (4) The procedures previously employed by the teachers for aggressive and resistive behavior could be used. For example, a child could be kept in from recess, not allowed to see a film in the afternoon, or taken from the room and talked to by one of the teachers.

Modification II

The teachers were instructed to return to the identical procedures described under Modification I. Data were taken until it was clear that the subjects' behavior had stabilized at an acceptable level in terms of manageable classroom behavior (15 days). The minimum criterion for terminating data collection was a five-day sequence in which desirable behavior averaged above 90% and did not drop below 80%.

RESULTS

Teacher Variables

Before evaluating the changes in the behavior of the subjects, it is valuable to analyze the changes in the teachers' behavior. The teachers' verbal behavior was recorded when-

ever they were interacting with the two girls. Day-by-day graphs were plotted and served as feedback to the teachers throughout the modification and postmodification conditions. In Fig. 1 and 2, a summary of the frequency of teacher interaction is presented for five 10-day intervals: Baseline, Modification I-A (first 10 days), Modification I-B (last 10 days), Postmodification, and Modification II (last 10 days).

In Fig. 1, the results of the frequency of teacher interaction with Jane are presented with Teacher A's interactions in the upper panel and Teacher B's interactions in the lower panel. (The data from Modification II in math includes interactions from both teachers because, during this phase, Jane was advanced from the lowest academic math group to the intermediate math group.)

In both the upper and lower panels similar trends are evident. In Modification I-B, compared with Baseline, there was an overall increase in the total number of interactions of each teacher and an obvious increase in both positive and neutral teacher attention. Other interactions decreased. By Modification I-B, Teacher A had very little redirecting behavior and no negative interactions, while Teacher B had considerably decreased her redirections and negative interactions.

In the Postmodification condition, there was an overall decrease in the positive, neutral, and question categories. However, it is of note that neither teacher increased her negative interactions and redirections to Baseline level. During this condition, Teacher B's positive interactions were much higher than in Baseline.

During Modification II, there was an immediate increase in both positive and neutral interactions from both teachers. Negative interactions did not occur at all, and the amount of redirection by the two teachers remained low.

The frequency of Teacher A's interaction with Dianne is presented in Fig. 2. Note the relatively high frequency of redirections and negative interactions in Baseline. By Modification I-B, the negative interactions ceased, the number of redirections decreased, and the positive and neutral interactions increased. This increase in positive and neutral may have been related to the fact that the math group allowed more time for individual attention.

Fig. 1. Frequency of teacher's interactions with Jane. Teacher A's interactions, presented in the upper panel, were recorded during reading; Teacher B's during math.

Fig. 2. Frequency of Teacher A's interaction with Dianne. Interactions in the upper panel were recorded during reading; in the lower panel during math.

Table 3
The Relationship between the Frequency of the Teachers' Interactions and Jane's Behavior

	<i>Baseline</i>	<i>Mod. I-A</i>	<i>Mod. I-B</i>	<i>Postmod.</i>	<i>Mod. II</i>
READING (Teacher A)					
Desirable Behavior					
Positive	22.39%	33.62	41.43	22.00	36.53
Neutral	34.83	33.86	38.65	55.00	42.44
Question	23.38	17.90	19.12	15.00	19.93
Redirect	1.49	1.31	0.40		0.37
Negative		0.44			
Inappropriate Behavior					
Positive	0.50			1.00	
Neutral	4.98	0.87		5.00	
Question	0.50	0.87			
Redirect	4.98	4.36	0.40	1.00	0.74
Negative	1.99	0.87		1.00	
Unacceptable Behavior					
Positive					
Neutral	0.50	0.44			
Question	1.49				
Redirect	2.49				
Negative	0.50	0.44			
MATH (Teacher B)					
Desirable Behavior					
Positive	18.40	40.76	49.90	33.19	37.27
Neutral	23.93	34.51	41.62	50.84	42.86
Question	23.31	14.67	6.46	7.14	19.25
Redirect	6.13	1.36	0.61	0.84	
Negative	0.61		0.20		
Inappropriate Behavior					
Positive	1.84	2.17		0.42	
Neutral	3.07	2.17		2.52	
Question	4.29	0.27		0.42	
Redirect	16.56	2.99	0.81	3.78	0.62
Negative		0.54	0.40		
Unacceptable Behavior					
Positive					
Neutral					
Question	0.61				
Redirect	0.61			0.84	
Negative	0.61	0.54			

NOTE: Teacher's interactions given in percentage of frequency of total teacher interaction for each condition as a function of the child's behavior category.

During Modification II, Teacher A increased her positive and neutral interactions. Also, as noted in Fig. 1, negative interactions did not recur and the number of redirections was very low.

To understand more fully the interaction between the child's behavior and the teacher's behavior, it is important to consider the behavior of the child at the time the teacher interacted with her. Tables 3 and 4 present matrices which illustrate these changes in the teachers' verbal behavior when they made their behavior contingent upon the children's behavior.

From these matrices, one can see how the percentage of responses in each category varied across conditions. In Table 3, the interactions with Jane show that, from Baseline to the end of Modification I, Teacher A's percentages of positive interactions almost doubled and Teacher B's tripled. Teacher A's total percentage of positive, neutral, and questioning interactions with Jane for desirable behavior increased from 80.60% in Baseline to 99.20% in Modification I and to 98.89% in Modification II. For Teacher B, the total percentage of these three interactions with Jane increased from 65.64% in Baseline to 97.98% in Modi-

Table 4

The Relationship between the Frequency of Teacher A's Interactions and Dianne's Behavior

	<i>Baseline</i>	<i>Mod. I-A</i>	<i>Mod. I-B</i>	<i>Postmod.</i>	<i>Mod. II</i>
READING					
Desirable Behavior					
Positive	25.13%	29.54	36.90	14.18	26.27
Neutral	31.28	23.21	29.95	45.52	52.97
Question	9.23	24.47	20.86	22.39	18.22
Redirect	2.05	3.80		4.48	0.85
Negative					
Inappropriate Behavior					
Positive		0.84			
Neutral	2.56	5.91		2.24	
Question	2.05	0.84	2.67		
Redirect	6.67	6.33	3.21	8.21	1.69
Negative	1.54	0.84		1.49	
Unacceptable Behavior					
Positive					
Neutral	2.56	0.42			
Question	0.51				
Redirect	9.74	2.11	1.07	1.49	
Negative	6.67	1.69			
MATH					
Desirable Behavior					
Positive	16.11	37.58	40.79	20.28	29.78
Neutral	21.67	27.18	35.95	55.24	51.10
Question	11.11	15.77	17.82	7.69	16.54
Redirect	3.89	0.67	0.60	1.40	
Negative	1.67	1.34			
Inappropriate Behavior					
Positive	5.00	3.02		0.70	
Neutral	7.78	4.03	0.30	4.90	
Question	3.89	1.01	0.60		
Redirect	17.22	7.05	3.63	9.09	2.57
Negative	1.67	2.01		0.70	
Unacceptable Behavior					
Positive	0.56				
Neutral	0.56	0.34			
Question	0.56		0.30		
Redirect	7.78				
Negative	0.56				

NOTE: Teacher's interactions given in percentage of frequency of total teacher interaction for each condition as a function of the child's behavior category.

fication I and to 99.38% in the case of Modification II.

For Teacher A's interactions with Dianne, presented in Table 4, the positive, neutral, and questioning interactions for desirable behavior increased from 65.64% to 87.71% in reading and from 48.49% to 94.56% in math by the end of the Modification I phase. By the end of the Modification II phase, these three types of interactions accounted for over 97% of all Teacher A's interactions and were restricted to the child's desirable behaviors.

Tables 3 and 4 show also that in Baseline there was a low frequency of reinforcing desirable behavior and that the teachers were not consistent. There was a lack on the teachers' part in making their behavior an effective consequence of the children's behavior. By looking at the interactions in the modification conditions, however, one can see how extremely consistent the teachers became. By the end of Modification I, positive reinforcement from the teachers (*i.e.*, positive, neutral, and questioning) almost all occurred only

Fig. 3. Cumulative frequency of the number of times each child was taken to the quiet room.

when the children's behavior was in the desirable categories.

Social Isolation

A cumulative record of the number of times each child was taken from the classroom for social isolation is presented in Fig. 3. In Modification I, this contingency was frequently used. During the three months after data collection, Jane was not taken to the isolation room at all; Dianne was taken six times during the first month and none during the second and third months.

Children's Behavior

Figures 4 and 5 show the percentage of time Jane spent in each of the three subdivisions—desirable, inappropriate, and unacceptable—for each session. In Baseline, Jane's desirable behavior was more stable in reading than in math. This was possibly due to the differences in the child's response to the two teachers. Jane's highly variable behavior in math is shown in Fig. 5 where, on Days 1, 3, and 10, over 90% of her time was spent in inappro-

priate behaviors. The high percentage of appropriate behaviors that did occur during Baseline showed that the behaviors to be reinforced were in the child's repertoire.

When treatment was put into effect and isolation from the classroom made contingent upon not attending the group activities, changes in Jane's behavior began to take place immediately. After only four days of treatment, she seldom had to be reminded that she was to attend the group. During Modification I, Jane's desirable behavior increased and stabilized in each group while the inappropriate and unacceptable behaviors decreased. Whenever she did engage in inappropriate or disruptive behaviors, a warning from the teacher served quickly to bring her back in line.

Figures 4 and 5 show that during the Post-modification condition there was a definite decrease in Jane's appropriate behavior. In the afternoon math class, Jane was considered a major problem again. On several days, Jane did not attend the math group until it was almost over, and when she did attend, she

Fig. 4. Jane in reading. Her behavior, subdivided under desirable, inappropriate, and unacceptable, is presented by days for each condition. I = time spent in the quiet room during data collection.

Fig. 5. Jane in math. Her behavior, subdivided under desirable, inappropriate, and unacceptable, is presented by days for each condition. I = time spent in the quiet room during data collection.

disrupted the behavior of the other group members. In the reading group, the inappropriate behaviors did not approach the Baseline level, but were nevertheless much more frequent than in Modification I-B.

When the contingencies were reintroduced in Modification II, there was a corresponding change in the behavior pattern. Desirable behavior increased and for the last 11 days was at 90% or above in each group.

Dianne's day-by-day behavior is plotted in Fig. 6 and 7. From the Baseline data in these figures, one can see how severe a problem this child was. On Days 1, 2, and 8 in the reading group, Dianne was behaving either inappropriately or unacceptably 100% of the time. In the math group, at no time during the two weeks of Baseline was her appropriate behavior above 74%.

When the treatment variables were introduced, appropriate behaviors began to increase and after the fourth day did not drop below 50%. During the first few days, she was warned and taken to the quiet room frequently for unacceptable behaviors.

When the contingencies were removed in the Postmodification condition, Dianne's appropriate behaviors remained high. Because

of this, Teacher A was asked to give Dianne as little attention as possible. Although Dianne's inappropriate behavior did increase, there was no return to the extremely disruptive behaviors that occurred before treatment. During Modification II, desirable behaviors increased in each group setting.

During the three months after the study was completed, three follow-up observations of the behavior of each child showed that the amount of desirable behaviors in the classroom remained high, ranging from 85 to 100%.

DISCUSSION

With both children, the results indicated that the treatment conditions were effective in helping to establish and maintain the appropriate classroom behaviors and to diminish the disruptive behaviors sharply. Jane's behavior in the Postmodification condition demonstrated that the treatment contingencies were effective in stabilizing her desirable behavior. When the treatment contingencies did not follow her unmanageable behavior, this behavior increased in frequency.

In the Postmodification condition, Dianne's appropriate behavior decreased but did not

Fig. 6. Dianne in reading. Her behavior, subdivided under desirable, inappropriate, and unacceptable, is presented by days for each condition. I = time spent in the quiet room during data collection.

Fig. 7. Dianne in math. Her behavior, subdivided under desirable, inappropriate, and unacceptable, is presented for each condition. I = time spent in the quiet room during data collection.

approach the Baseline level. From informal observation it appeared that there were other contingencies than those arranged in treatment that were controlling Dianne's behavior. For example, she seemed to receive a lot of attention from peers who both praised her when she was appropriate and warned her to change when she was not. She also spent more than the required time on her workbooks. These results suggest that for Dianne the treatment variables were instrumental in helping to establish certain behavior patterns, but other contingencies also helped to maintain the behavior.

Typically, the application of behavior modification techniques has centered on recording and altering a single operant (e.g., Harris *et al.*, 1964; Hart *et al.*, 1964; Wolf *et al.*, 1965). The present study and another recent study (Sibley, Abbott, and Cooper, 1969) explored the possibility of using the classroom analysis procedure developed by Spaulding (1967). This system has at least two advantages. First, recording by CASES enables the observer to record a type of behavior (i.e., aggressive behavior) rather than each separate act (i.e., hitting, pushing, grabbing books from another child). This is particularly advanta-

geous with certain children for whom it would be difficult to record every separate behavior one wanted to increase or decrease. Secondly, recording by categories also allows the experimenter to observe closely the changes in the children's behavior. For example, as a child increased her appropriate behavior, one could see if the child was beginning to spend most of her time in a conforming category (i.e., Following Directions Passively and Submissively) or was spending most of her time interacting with the teachers and other children (i.e., Social Interactions or Sharing and Helping). A major disadvantage of using this classification system arises from the difficulty in discriminating among the categories.

For summary purposes in this paper, the children's behavior was presented under the three subdivisions: desirable, inappropriate, and unacceptable. These general divisions provided sufficient information for certain purposes such as observing the consistency of contingent teacher attention. A classification system using only these more general divisions may be sufficient in a setting in which one is not interested in looking at each category.

This study made a successful attempt to obtain maximum involvement on the teacher's

part. The teachers plotted their own day-by-day changes in behavior, and from the data they could easily compare their verbal behavior with the behavior of the child when they interacted with her. The recording procedure also allowed the teacher to look at her consistency and immediacy of interaction with a child. The teachers described this procedure as very helpful in understanding the effectiveness of their own interactions.

The successful completion of these two simultaneous studies and the work of others (Hall *et al.*, 1968) indicates that behavior modification techniques can be successfully carried out by teachers in primary classrooms. It is suggested that the success of these and similar studies is measured not only by changes in the child's behavior, but also by the changes in the teacher's behavior. Once a teacher can alter her behavior to become more effective in handling one child, she should be able to generalize her behavior to the total classroom situation. Also, when a teacher spends less time on behavior management, she should have more time for directing classroom activities.

REFERENCES

- Allen, K. E., Hart, B. M., Buell, J. S., Harris, F. R., and Wolf, M. M. Effects of social reinforcement on isolate behavior of a nursery school child. *Child Development*, 1964, **35**, 511-518.
- Hall, R. V., Lund, D., and Jackson, D. Effects of teacher attention on study behavior. *Journal of Applied Behavior Analysis*, 1968, **1**, 1-12.
- Harris, F. R., Johnston, M. K., Kelley, C. S., and Wolf, M. M. Effects of positive social reinforcement on regressed crawling of a nursery school child. *Journal of Educational Psychology*, 1964, **55**, 35-41.
- Hart, B. M., Allen, K. E., Buell, J. S., Harris, F. R., and Wolf, M. M. Effects of social reinforcement on operant crying. *Journal of Experimental Child Psychology*, 1964, **1**, 145-153.
- O'Leary, K. D. and Becker, W. C. Behavior modification of an adjustment class: a token reinforcement program. *Exceptional Children*, 1967, **33**, 637-642.
- Sibley, S. A., Abbott, M. S., and Cooper, B. P. Modification of the classroom behavior of a disadvantaged kindergarten boy by social reinforcement and isolation. *Journal of Experimental Child Psychology*, 1969, **7**, 203-219.
- Spaulding, R. L. *Introduction to the use of Coping Analysis Schedule for Educational Settings (CASES)*. Education Improvement Program, Duke University, Durham, North Carolina, 1967.
- Wolf, M. M., Birnbrauer, J. S., Williams, T., and Lawler, J. A note on apparent extinction of the vomiting behavior of a retarded child. In L. P. Ullmann and L. Krasner (Eds.), *Case studies in behavior modification*. New York: Holt, Rinehart & Winston, 1965. Pp. 364-366.
- Zimmerman, E. H. and Zimmerman, J. The alteration of behavior in a special classroom situation. *Journal of Experimental Analysis of Behavior*, 1962, **5**, 59-60.

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