*ADVERSE EFFECTS OF DIFFERENTIAL PARENTAL ATTENTION*¹

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In two independent parent training projects (Kansas and Mississippi), mothers of deviant young children were observed to follow almost all child behaviors with attention. The mothers were then trained to use differential attention procedures to increase their child's appropriate behaviors and to decrease deviant behaviors. Contrary to expectations, the differential attention procedure produced substantial increases in deviant behavior for four of the children. This adverse effect was maintained over many sessions and was replicated in single organism, reversal designs. A fifth child showed no change. A sixth child showed some improvement. However, this effect was not recovered in a second application of differential attention, and the child became worse. The results underline the importance of subject generality in applied behavior analysis and strongly suggest that service programs using operant techniques must carefully evaluate their effects on behavior.

Differential social attention from adults is used frequently as a technique for the modification of child behavior. This procedure entails the contingent and frequent application of adult's attention following desired child behaviors and the removal of attention following undesired child behaviors. Its use is based on the assumption that adult attention functions as a class of positive reinforcers for most children, and that adult attention is probably maintaining the undesirable behaviors exhibited by the child.

Successful modifications of a variety of behaviors of deviant and normal young children have supported these assumptions. Behavior

problems modified with differential teacher attention in preschool classrooms include infrequent social interaction with other children, minimal vigorous physical activity, hyperactivity, regressive crawling, uncooperative behavior, and excessive crying, (*e.g.*, Harris, Wolf, and Baer, 1964). In public school classrooms, differential teacher attention has been used to increase study behavior (*e.g.*, Hall, Lund, and Jackson, 1968) and to decrease inappropriate behavior (*e.g.*, Madsen, Becker, and Thomas, 1968). Hall and Broden (1967) found that differential parental and teacher attention was sufficient to produce substantial, desired behavior change in brain-damaged children. In a laboratory-clinic setting, Wahler, Winkel, Peterson, and Morrison (1965) trained two mothers to use differential attention. One mother increased her child's cooperative behavior; the other decreased her child's excessive dependency. The same procedure was used to increase a young boy's study behavior and decrease his inappropriate behaviors at home and in a public school classroom (Wahler, 1969*b*). In a clinical program for parents of very young oppositional children, differential parent attention has been reported to decrease oppositional behavior (Wagner and Ora, *unpublished*).

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Although there are many reports of desired behavior changes, the careful use of differential attention procedures by teachers and parents has not always worked. For example, in a public school classroom, O'Leary, Becker, Evans, and Saudargas (1969) found that differential teacher attention did not decrease disruptive behavior for six of seven children. Five of the six children subsequently improved when a token system was added. Differential parent attention was ineffective in altering oppositional behavior in several cases reported by Wahler *et al.*, (1965) and Wahler (1969a). Oppositional behavior decreased for these children when a timeout procedure was added. The simplest description of these failures is that adult attention was not a reinforcer for some children.

While the effectiveness of differential attention procedures in modifying child behaviors cannot always be assured, this procedure has a practical advantage as an initial component of a parent-mediated intervention program. First, it has been suggested that parents of children with behavior problems are reinforcing deviant child behaviors by giving attention to those behaviors (*e.g.*, Bijou and Baer, 1967; Hawkins, Peterson, Schweid, and Bijou, 1966; Patterson, 1969). Second, few new parent behaviors would need to be taught. Rather, the present levels of parent attention would be rearranged with respect to child behaviors. Third, parents could use this procedure in any setting with their children (*e.g.*, grocery stores). Fourth, parents are widely counselled to use differential attention procedures to modify child behaviors (*e.g.*, McIntire, 1970; Patterson and Guillion, 1968; Smith and Smith, 1966). The few prior contradictory findings (*e.g.*, O'Leary, *et al.*, 1969; Wahler, 1969a) and the practical advantages of the differential attention procedure for parents gave rise to the present research.

Two clinical parent training projects were independently conceived and conducted, one at the University of Kansas and one at the University of Mississippi Medical Center. Parents in both projects were trained to use differential

attention procedures with their young deviant children. Contrary to expectations, four of the six children were adversely affected by the differential attention procedures. That is, they showed substantial increases in deviant behavior when their mothers ignored these. Appropriate behavior declined, even though it was heavily praised. A fifth child was unaffected by differential attention; a sixth showed some improvement, which was not sustained.

METHOD

Subjects

Six mother-child pairs were used. Their economic backgrounds ranged from state welfare assistance to upper middle class. The mothers' ages ranged from 27 to 44 yr. Descriptive characteristics of the children appear in Table 1. None of the children was enrolled in regular public school classrooms. The mothers in the Kansas group were volunteers recruited from the community and local remedial programs for deviant children. In the Mississippi group, they were referred through the outpatient child clinic of the Department of Psychiatry. Before they joined the projects, the scientific intent of the research and possible therapeutic benefits for them and their children were described to the mothers. Because of the experimental nature of the projects, no fees were charged.

Settings, Materials, Activities

At Kansas, the setting was a large preschool classroom. The mother and child sat at adjacent sides of a small table, partially screened from the rest of the room by movable 3-ft partitions. An observer and an experimenter were always proximate but did not interact with the subjects during the session. During sessions for Lanae and Charlotte, other adults and children were in the same room engaged in quiet one-to-one research projects. A manual kitchen timer and other materials to be used by the mothers were available on a shelf within her reach. Each day the mother presented four preacademic and academic tasks

Table 1
Descriptive Characteristics of Child Subjects

<i>Setting</i>	<i>Child</i>	<i>Age</i>	<i>Diagnoses</i>
Kansas	Lanae	5	abnormal EEG, childhood autism, IQ 97 (Peabody Picture Vocabulary Test)
	Charlotte	6	no medical signs, familial retardation, IQ 85 (PPVT)
	Harold	5	Downs syndrome, IQ 40 (PPVT)
	Jerry	8	abnormal EEG, controlled motor seizures, hyperactive, IQ 85 (PPVT)
Mississippi	Edward	7	hyperactive, learning disability, IQ 96 (Ammons Full Range Picture Vocabulary Test)
	Joseph	5	severe opposition and disobedience, IQ 101 (PPVT)

to her child, each for 5 min. The order of task presentations was randomized across days with the restriction that each task occur in each position, *i.e.*, first, second, third, and fourth, every four days. These tasks included labelling objects, colors, and numbers; tracing and printing letters, and reading words. The materials used and the procedures for their presentation were modified and sequenced as needed for individual children. For example, Lanae could not respond to colors on small cards. However, she did respond to colored animals. New materials were added when the child demonstrated mastery. No attempt was made to equate task difficulty over time; however, changes in materials were never made on the same day that an experimental intervention was started. For each task, the mothers were provided a written instruction on the procedures to be used in presenting the materials and in recording child responses. However, they were not told how to attend to their children in order to teach them the tasks.

At Mississippi, clinic sessions were conducted in a 10- by 13-ft room containing a low table, chairs, and a toy cabinet. The room had two small clear windows adjoining adjacent, completely separated observation booths that were wired for sound. For Joseph, task materials in-

cluded paper, pencil, and model to be used in writing the letters of the alphabet. His mother was instructed to have him write the alphabet during the sessions. For Edward, materials were 10 toys to be presented by his mother in a fixed order for 2 min each. She was instructed to have him play only with the assigned toy during each 2-min period.

Observation and Recording Procedures

The mother-child pairs were observed in the clinic settings four or five days a week for 20-min sessions. Child behaviors and mother attention were continuously time-sampled in 10-sec intervals. In each interval, one or more categories of child behavior were scored and parent attention was recorded if it occurred during or after that child behavior category. All child behavior was defined to be included in three categories: task-oriented, deviant, and neither. Parent attention was defined as speaking to or touching the child. See Appendix for detailed definitions and recording rules.

At Kansas, the observer was equipped with a stopwatch, clipboard, and data sheets and was seated on a camp stool adjacent to the subjects. Reliability checks were made by two and sometimes three observers sitting side-by-side.

At Mississippi, the observer recorded from one of the observation booths. Ten-second intervals were cued by a tape-recorded auditory signal. When reliability estimates were made, the second observer recorded from the adjacent observation room; the reliability checks were completely independent. For Joseph, the number of alphabet letters written legibly was recorded by the observer after the session.

Reliability Estimates

Inter-observer agreement on the behavioral recordings was computed separately for the occurrence of deviant child behavior, task-oriented child behavior, and the occurrence of parent attention following each of these child behavior categories. An agreement was scored if both observers recorded the behavior in question in the same 10-sec interval; a disagreement was scored if only one observer recorded that behavior. Agreement on the nonoccurrence of the behavior was not counted as an agreement. Reliability estimates were obtained by dividing the number of agreements by the sum of the agreements plus disagreements. Total frequency reliability estimates were made on the number of letters written by Joseph by dividing the smaller number for a session by the larger number as counted by independent scorers. At Kansas, a reliability check was made at least once, often twice, for each subject pair for each experimental condition. At Mississippi, a reliability check was made once for each subject in each different experimental condition. Thus, reliability estimates were obtained when the behaviors were observed to occur at high and low rates. In addition, on one occasion, the regular Mississippi observer was not told that a reliability check was being made. The observer was totally unaware that such surreptitious checks might be or were made.

Parent Training Procedures

In the Kansas setting, two procedures were used to train the mothers to use differential attention procedures: written instructions and a

hand signal from the observer. Written instructions were always tried before hand signalling was used. The written instructions, approximately one page double-spaced, included a rationale for reducing attention to the deviant behaviors, enumeration of deviant behaviors exhibited by that particular child, instructions for "freezing" as long as the child engaged in deviant behaviors, instructions to give attention whenever the child was not engaged in deviant behaviors, and a statement describing the results that might be obtained with this procedure. "Freezing" was described as having a blank, expressionless face, not saying anything to the child or touching him, and not responding to any form of interaction initiated by the child so long as he was behaving inappropriately. The mothers were not given feedback on the success with which they followed this instruction, but any questions they had regarding the procedures were answered before or after each session.

For three of the four Kansas mothers, hand-cuing by the observer was implemented further to reduce their attention to deviant child behavior. In cuing, the observer placed one or more fingers on her cheek as soon as and as long as the child's behavior met the definition for deviant behavior. The mothers were told to "freeze" as soon as the observer touched her face and to remain "frozen" as long as the cue was presented. Again, no feedback was provided.

In the Mississippi setting, a cuing procedure with feedback was introduced immediately after the initial baseline condition. Both mothers were first given a rationale and specific instructions for the differential attention procedures. During the sessions, the mother wore an FM receiver with a small ear plug. The observer cued the mother when to give attention and gave feedback (both positive and negative) on the mother's behavior via a wireless microphone. The child could not hear this feedback. These mothers were instructed to ignore by turning away when their children engaged in deviant behavior. If the child became physically abusive,

e.g., hitting or pulling, the mother was instructed to walk away from the child. Praise was to be given whenever the child exhibited appropriate behavior.

Experimental Conditions and Design

Because there were great differences in the nature and sequence of the experimental conditions planned for each child and because there was some variability in the manner in which the mothers implemented these conditions, the exact sequence and nature of the experimental conditions is best understood by referring to the figures. The following is a general description of the experimental conditions.

1. *Baseline.* In baseline conditions, all mothers were instructed to do whatever they normally would do to get their children to perform the assigned tasks. When baseline conditions were reinstituted after an experimental procedure, the mothers were instructed to respond as they had in the initial baseline condition and not to use differential attention procedures.
2. *Differential attention to task behavior.* Four varieties of differential attention procedures were used at different times in the study. In one, used with all children, the mothers were instructed to remove all attention from deviant child behavior while maintaining baseline levels of attention to appropriate task-oriented behavior. Given prior research and theoretical considerations, this was expected to be the most effective procedure. A second differential attention procedure, used initially with Edward, was a combination of removal of all attention from deviant behavior and a reduced rate of attention to task-oriented behavior. The resulting decrease of the absolute (overall) level of maternal attention was thought to be a good approximation to levels of attention that might exist in the child's normal home environment. Certainly, the ordinary child does not receive attention for 70 to 100% of his appropriate behavior. A third differential attention procedure, used in later conditions with Edward, involved attention for all deviant behavior and ignoring for all task-oriented behavior. This was done to afford a more vigorous test of the effects of maternal attention on deviant behavior. A fourth procedure, used later with Charlotte and Lanae was a partial differentiation procedure in which the mother was cued to ignore some but not all deviant behaviors. The experimenter cued the mother to ignore so as to keep the absolute rate of parent attention within 20% of baseline levels. This was done to minimize reductions in absolute levels of maternal attention.
3. *Tokens.* Token consequences were used for Joseph from the middle of the first differential attention condition to the middle of the second differential attention condition. Tokens, Xs on a sheet of paper, were given with praise contingent on each alphabet letter written during the session and were exchangeable for home privileges of outdoor play, snacks, preferred toys, trips, etc.
4. *Timeout.* For Jerry, a timeout contingency was added to differential attention in the last conditions. His mother was instructed to place him in a nearby chair facing the wall for 1 min if he left his chair at the work table or moved that chair or the table outside an area taped on the floor. If he left the timeout chair, she was instructed to spank him, seat him on the timeout chair, and reset the 1-min interval. All other deviant behaviors were to be ignored, and the observer continued to cue the mother when to ignore. All appropriate behaviors were to be praised.

Table 2
Mean Percentage Interobserver Agreement for all Reliability Checks

<i>Kansas</i>	<i>Charlotte</i>	<i>Harold</i>	<i>Lanae</i>	<i>Jerry</i>
deviant behavior	87%	92%	87%	90%
task-oriented behavior	93%	86%	89%	92%
attention to deviant	75%	83%	81%	75%
attention to task-oriented	90%	85%	87%	87%
<i>Mississippi</i>	<i>Joseph</i>	<i>Edward</i>		
deviant behavior	95%	90%		
task-oriented behavior	93%	94%		
attention to deviant	*76%	*81%		
attention to task-oriented	*82%	*90%		
letters written	99%	—		

*Several reliability estimates were made when the rates of these behaviors were zero. On all occasions the observers agreed that none of these behaviors occurred.

RESULTS

Reliability

Mean inter-observer agreements (calculated from totals across conditions) appear in Table 2. With few exceptions, the mean percentage agreements on the occurrence of all behavior categories were 80% or better for each child. The surreptitious Mississippi check yielded esti-

mates within the range of the non-surreptitious checks.

Kansas

For all children, Kansas and Mississippi, the figures show the percentage of session time the child was deviant and task-oriented and the percentages of those behaviors that were followed by maternal attention in each condition.

Fig. 1. Percentage of 10-sec intervals Charlotte was engaged in deviant behavior (upper panel) and task-oriented behavior (lower panel). The percentages of those behaviors followed by maternal attention appear in parentheses. At the arrow the mother was cued to ignore all deviant behaviors.

In Figure 1, Charlotte's deviant behavior initially averaged 21% of the session. When her mother reduced her attention to that behavior from 90% to 43%, the child's deviant behavior increased slightly to 27%. Cuing, which reduced the proportion of deviant behavior given attention to 11%, increased Charlotte's deviant behavior dramatically and reduced task-oriented behavior. When baseline levels of attention to deviant behavior were reinstated, deviant behavior decreased and task-oriented behavior was increased. In the second differential attention condition, the mother was signalled to ignore some but not all of Charlotte's inappropriate behavior. These intermediate reductions in attention to deviant behavior were not successful in changing that behavior in the desired direction. Task-oriented behavior was unaffected.

Figure 2 shows the same data and similar results for Lanae. Over the 22 days of baseline, her deviant behavior averaged 28% of the session. When her mother was instructed to

ignore, deviant behavior increased sharply. Original baseline levels were recovered when the mother again gave attention following most deviant behaviors. Next, the mother was cued to ignore some but not all deviant behaviors. Lanae's deviant behavior increased to a rate intermediate to her rate in baseline and to the rate in the more complete ignoring condition. Subsequent applications of baseline and differential attention conditions replicated the deleterious effects of ignoring her deviant behavior. Lanae's task-oriented behavior was inversely related to the changes in her deviant behavior, although the proportion of maternal attention for this behavior was stable through all conditions.

The effects of the application of differential attention procedures for Jerry appear in Figure 3. When his mother reduced her attention to deviant behavior from 95% to 42%, his behavior showed a transitory improvement before returning to baseline levels. The mother was

Fig. 2. Percentage of 10-sec intervals Lanae was deviant (upper panel) and task-oriented (lower panel). The percentages of those behaviors followed by maternal attention appear in parentheses.

Fig. 3. Percentage of 10-sec intervals Jerry was deviant (upper panel) and task-oriented (lower panel). In parentheses are the percentages of those behaviors followed by maternal attention. At the arrow, the mother was cued to ignore all deviant behavior. The numbers at the bottom of the graph for deviant behavior indicate the frequency of timeout.

Fig. 4. Percentage of 10-sec intervals Harold was deviant (upper panel) and task-oriented (lower panel). In parentheses are the percentages of those behaviors followed by maternal attention. At the arrow, the mother was cued to ignore all deviant behaviors.

then cued to ignore. Over the next 20 sessions, Jerry's deviant behavior gradually decreased from a mean of 38% for the first nine days to a mean of 22% for the last nine sessions. A return to baseline did not recover the previously high baseline level of deviant behavior, although a clear trend to higher levels was present. When the mother was again cued to ignore deviant behavior, Jerry's deviant behavior dramatically increased and showed no sign of reduction for 10 days. The parent gave attention to only 2% of his deviant behavior in this condition. During this condition, Jerry spent a good portion of each session out of his chair, a behavior he had not exhibited in the previous baseline condition. The chair timeout procedure was then applied whenever he left his seat at the table, while his mother

continued to ignore other deviant behaviors. After three applications of the timeout procedure, his rate of deviant behavior decreased below baseline levels. When the timeout contingency was removed, he did not leave his chair for the first two sessions. On the third and fifth days, he left his chair early in the session and spent most of the time running about the room, stacking furniture, and attacking the experimenter. The reinstatement of the chair contingency again reduced deviant behavior. Throughout these various manipulations, task-oriented behavior varied inversely with deviant behavior.

In Figure 4, it can be seen that Harold's rates of deviant and task-oriented behavior were little affected by the differential attention procedures.

Fig. 5. Percentage of 10-sec intervals Joseph was deviant (upper panel) and task-oriented (middle panel), and the number of alphabet letters written (lower panel). In parentheses are the percentages of those behaviors followed by maternal attention. A token was given for each letter written during Sessions 31 to 62.

Throughout the various conditions, deviant behavior averaged about 68% of the session and task-oriented behavior averaged about 26% of the session. The mother did substantially decrease the amount of attention given to his deviant behavior. However, the use of cuing procedures did not produce an added improvement to the mother's efficiency at ignoring his deviant behavior.

Mississippi

Figure 5 shows the percentage of intervals observed in which Joseph exhibited deviant behavior and task-oriented behavior, and the number of alphabet letters he wrote. The cuing procedure reduced the percentage of deviant behavior receiving parent attention from 90% to only 4%. No effect was noted for the first 19 sessions (6.33 hr) of this procedure. However, task-oriented behavior and the number of letters written decreased and then rose slowly. For the last four sessions, though, deviant behavior sharply increased to over 80% of the session time. Both task-oriented behavior and productivity on the task again decreased. When baseline levels of parent attention were reinstated, deviant behavior decreased and the desired be-

haviors increased. In the second application of differential attention, the mother gave attention to only 1% of his deviant behavior and to 99% of his task-oriented behavior. Joseph's deviant behavior again increased. The application of the token system had no obvious effects on his performance, even though his low rate of writing letters meant he lost most of the home privileges he typically enjoyed.

Figure 6 shows Edward's performance. His baseline rate of deviant behavior was lower than that for any subject, averaging 10% of the session time. However, the mother reported much higher rates of deviant behavior at home. With the ignoring of all deviant behavior and attending only to some task-oriented behavior, his deviant behavior rose while appropriate behavior decreased slightly. When his mother again gave attention following most of his deviant and task-oriented behavior, deviant behavior decreased to baseline levels while appropriate behavior increased. High rates of deviant behavior were recovered when the initial differential attention procedures were again applied. Next, his mother was cued to give attention following most of his task-oriented behavior while continuing to ignore all deviant behavior.

Fig. 6. Percentage of 10-sec intervals Edward was deviant (upper panel) and task-oriented (lower panel). The percentages of those behaviors followed by maternal attention appear below condition labels. Edward was exposed to conditions of differential attention for task-oriented and deviant behavior.

A transitory decrease in deviant behavior was not maintained, and task-oriented behavior increased slightly but not to original baseline levels. Following this condition, the mother heavily attended to deviant behavior, while task-oriented behavior was completely ignored. Deviant behavior increased to the highest observed levels and task-oriented behavior dropped only slightly. A return to a high level of attention for all task-oriented behavior and ignoring of all deviant behavior decreased deviant behavior to moderate levels and increased task-oriented behavior. A return to much attention for deviant behavior and no attention to task-oriented behavior increased deviant behavior to above 70%. The return to ignoring deviant behavior and attending heavily to task-oriented behavior recovered moderate rates of deviant. Next, original baseline conditions were reinstated where both behaviors were heavily followed by attention. Deviant behavior fell to below 10%. Finally, the deviant behavior was ignored again while task-oriented was praised. Deviant behavior again rose to moderate levels. Summarizing for Edward, three levels of deviant behavior were observed: (1) low, 10%, when deviant and task-oriented behavior were heavily attended; (2) moderate, 30 to 40%, when deviant behavior was ignored and task-oriented behavior moderately praised; and (3) high, 70 to 80%, when deviant behavior was moderately praised and task-oriented behavior ignored.

Summary

The inverse relationship between rate of deviant behavior and the probability of parent attention for Lanae and Charlotte following that behavior is seen clearly in Figure 7. For both children, deviant behavior increased in a nearly linear fashion as the percentage of deviant behavior receiving parent attention decreased. Joseph's results also fit this pattern. These linear relationships are the exact opposite of what would have been predicted by the previous research and by theoretical considerations. Figure 8 shows the relationship for Edward. It appears

Fig. 7. The percentage of intervals of deviant behavior for each condition as a function of the percentage of deviant behavior followed by maternal attention for Lanae (closed circles) and Charlotte (open circles). Each point is a mean computed from the total sessions in each condition.

to be an inverted U-shaped relationship. The relationship of these two variables (not shown) for Harold is a straight line with no slope, indicating no relationship. The inability to recover reductions of deviant behavior with differential attention procedures for Jerry obscures an analysis of the relationship of the percentage of maternal attention to rate of deviant behavior. For this reason it is not shown.

Fig. 8. The percentage of intervals of deviant behavior for each condition as a function of the percentage of deviant behavior followed by maternal attention for Edward.

DISCUSSION

The differential attention procedure did not produce the effects seen in previous research. Deviant behavior did not decrease but actually increased in a substantial and durable manner for four of the six children. In addition to these rate increases, topographies of deviant behavior appeared for all children in the differential attention conditions which were not observed in baseline conditions. For example, Jerry, Harold, Charlotte, and Edward began assaulting their mothers; Charlotte began scratching herself until bleeding occurred; Joseph rammed a pencil into his nose and bled profusely; and Jerry began dangerous and unusual climbing. It can be concluded that these children were adversely affected by this "simple" behavior modification procedure. In addition, adverse side-effects were noted. Although the mothers continued to attend heavily to task-oriented behavior (save Edward), this behavior was greatly reduced. Thus, not only did these four children increase the amount and kind of deviant behavior, they also decreased their appropriate, desired behaviors. Some adverse side-effects appeared at home. Edward became more enuretic and Joseph began urinating out his bedroom window, which was facing a busy street. An adverse side-effect of an extinction procedure was noted by Sajwaj, Twardosz, and Burke (1972). In general, they found desirable side-effects. However, their child became more disruptive during group academics when inappropriate speech was ignored during preceding freeplay periods. Laboratory research with lower organisms has found aggressive and "emotional" behaviors to appear during extinction periods (*e.g.*, Azrin, Hutchinson, and Hake, 1966; Knutson, 1970).

It should be noted that the quality of maternal attention given for task-oriented and for deviant behaviors during baseline conditions was not markedly different. Most of the mothers used similar forms of attention in coping with inappropriate behaviors. These took the form of

praise for other desired behaviors, repetition of instructions, urging, and suggestions for work. Mild threats and scolding were used occasionally for disruptions. Severe threats, physical punishment, or severe reprimands were rarely used, if ever. Only one mother would infrequently lightly slap her child's hand. Previous research suggests that these forms of adult attention may strengthen the inappropriate child behaviors they follow (Hayden, LeBlanc, Herbert, and Pinkston, *unpublished*; Thomas, Becker, and Armstrong, 1968.)

These unexpected results have not been reported in the literature so far and cannot be traced to peculiarities of these programs, because both projects differed markedly on specific details. Both projects were initially conceived to investigate and develop more efficient parent training techniques. It was only at the completion of this research that the authors in the two settings became aware of the other project. Thus, the results were not peculiar to a particular setting, certain parent-child activities, observation code or recording system, experimenters, or parent training procedures. Subject characteristics also were not predictive of the results obtained. Lanae, one of the children adversely affected, did not exhibit the oppositional or "brat" behavior described by Wahler (1969*a*), whereas Jerry, the only child to show some improvement with differential attention, was extremely oppositional and argumentative. The only obvious common characteristic of the mothers was their propensity to follow all child behaviors with some form of attention, but that characteristic was particularly salient for Harold's mother, who obtained no effect with differential attention.

Several possible issues are involved in these results: (1) the presence or absence of competing activities; (2) the decreases in absolute levels of maternal attention; (3) the effects of the contingency between deviant behavior and attention; (4) the role of "extinction burst" phenomenon in the increases of deviant behavior; (5) the role of intermittent schedules of attention in

maintaining the deviant behavior; and (6) the discriminative functions of the ignoring procedures.

First, only Jerry showed some improvement with the differential attention procedures, but this was short-lived. For him it appeared that parent attention was effective so long as the opportunity to engage in preferred activities was prevented. However, the competition of parent attention with other activities available in the room does not explain the adverse effects obtained for Lanae and Charlotte. Lanae left her chair on only two occasions throughout the differential attention conditions, and Charlotte did not leave her chair until her rate of deviant behavior had already doubled. In the Mississippi setting, the room was sparsely furnished, thus limiting competing activities.

Second, because the parents initially gave attention following almost every child behavior, the introduction of differential attention procedures decreased the absolute rate of parent attention. While this variable has not been properly studied, it has not been predictive of success or failure in other studies using differential attention procedures. For two successes and one failure reported by Wahler *et al.*, (1965) the absolute rate of parent attention was reduced to less than half of baseline levels. On the other hand, O'Leary *et al.*, (1969) found differential attention ineffective for modifying disruptive behaviors of six children when the total rate of teacher attention was unchanged.

Third, the various manipulations for Edward are perplexing. The first four conditions for Edward (as the manipulations of attention for Lanae, Charlotte, Jerry, and Joseph) demonstrate maternal attention to be a punishing event. The functional definition of a punisher is: any stimulus whose contingent application to a behavior decreases the future probability of that behavior. In baseline conditions, deviant behavior was followed by attention, and its rate was low; in differential attention conditions, attention was reduced for deviant behavior, and its rate increased. Therefore, maternal attention was func-

tionally a punishing stimulus. However, the next three conditions for Edward demonstrate maternal attention as a positive reinforcer. Here, deviant behavior increased when it was followed frequently by attention. Finally, the last three conditions again demonstrate attention as a punishing event. Thus, maternal attention served as a positive reinforcer and as a punishing stimulus for the same class of behavior in the same setting. This unusual finding can only be potentially resolved if the total range of the child's behavior (*e.g.*, task-oriented behavior) and the mother's behavior is carefully observed and recorded. Sufficient data to accomplish this most necessary task is not available in this research. Also, it may be that the simple, functional definitions of positive reinforcement and punishment are not comprehensive enough to lead to a complete understanding of complex human behavior. It is necessary that critical setting conditions and consequences for concurrent behaviors be carefully specified in these definitions. Otherwise, predictions based only on these simple definitions will be inaccurate, as in Edward's case. It should be noted that a similar procedure of heavy attention for deviant behavior and an ignoring of task-oriented behavior was attempted for Lanae. However, rates of deviant behavior remained at differential attention levels.

Fourth, the introduction of extinction procedures for deviant behavior might be accompanied by transitory increases in that behavior. Animal research has demonstrated such a phenomenon. Some behavior modification studies have noted such an effect (*e.g.*, Sajwaj and Hedges, *unpublished*). However, Charlotte, Lanae, Joseph, and Edward spent 4, 10, 9, and 5 hr respectively, in differential attention conditions with no clear trends for deviant behaviors decreasing. Although this is a short time relative to the children's apparent histories of nondifferential parent attention, differential attention procedures in previous research have had clear effects typically after 40 min to 3 hr. Furthermore, transitory increases produced by extinction procedures cannot explain the results obtained

for Joseph, who had 19 sessions of differential attention before deviant behavior increased.

A fifth consideration is the effects of intermittent delivery of attention for deviant behaviors. For the Kansas subjects, the probability of parent attention following deviant behavior was not reduced to zero. However, in the studies by Hall *et al.*, (1968), and Wahler (1969*b*) adult attention for the undesirable behavior was not completely eliminated, yet differential attention was effective in producing dramatic increases in the desired behaviors. In the Mississippi setting of this study, parent attention to deviant behavior was virtually eliminated, yet high rates of deviant behavior persisted. The role of intermittent parental attention is certainly not clear.

The sixth consideration is that the withdrawal of parent attention served as a discriminative stimulus for the child to increase severe deviant behavior. The mother might then be punished by this increase in deviant behavior. Thus, she is prompted to cease ignoring and to attend again to him. In turn, the child is reinforced for increases in deviant behavior under ignoring conditions. Therefore, when levels of parent attention are high, deviant behaviors are relatively low, and *vice versa*. If parent attention no longer followed deviant behavior, this relationship would be expected to weaken. However, this was not seen.

An adequate theoretical explanation for these disturbing results is premature at this time. However, the clinical implications are even more troublesome. The high intensity deviant behaviors exhibited by each of the children in some sessions of differential parent attention could not be tolerated in other than research settings. For example, Edward kicked out a window; Harold threw his shoes and wooden pegs at his mother; and Jerry pitched tables and chairs. Even if the continued application of differential attention procedures could decrease these behaviors, parents could not be expected to endure these disruptions at home.

At present, many parents and teachers are advised or trained to use differential attention

procedures as a component of therapeutic programs for children. This step has been taken on the basis of an assumed generality from the studies cited in the introduction to this paper. This assumes that parental attention is a positive reinforcer and that its systematic use in a differential reinforcement procedure will control undesirable behaviors. As noted, previous research has supported these assumptions. However, the present results and the failures previously noted by Wahler (1969*a*) and others suggest that the assumption of broad generality is certainly questionable. Until the limiting conditions have been identified for the successful application of such "elementary" behavior modification techniques, those engaged in wide-spread social intervention programs should be advised to proceed cautiously. At least, quantitative data on the effects of those procedures are absolutely essential.

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APPENDIX

Child behavior definitions, recording rules, and computational procedures.

Kansas

Task-oriented: verbal or motor activity directed to the performance of the task as instructed; head oriented toward the parent or the materials when the parent was instructing or presenting materials; compliance with any instruction.

Deviant: actions incompatible with the performance of the task, active noncompliance with instructions, atavisms, autisms, argumentative verbalizations, tipping chair, buttocks out of contact with chair seat, head on table or supported by arm (not elbow) on table.

Unoccupied: absence of task-oriented or deviant behavior.

Only a single category of child behavior and the occurrence of parent attention following that behavior could be recorded in a single interval. Deviant child behavior was recorded with priority over task-oriented behavior only if the mother had not attended to the task-oriented behavior. If neither deviant nor task-oriented behavior occurred for the first 5 sec of an interval, the child was scored unoccupied if the mother then attended to the unoccupied behavior. No further categories could be scored in that interval. The child was also scored as unoccupied if neither deviant nor task-oriented behavior occurred for the entire interval. If the child was unoccupied for 5 sec and if the mother had not yet attended to the child, deviant or task-oriented behavior could be scored if they occurred. Parent attention was recorded as following the child behavior scored in an interval if it occurred during or any time after that child behavior in that interval. Content of the attention, verbal and physical, was completely disregarded.

The complexity of these scoring rules results from the definition of a contingency used in this project. That is, a contingency was scored for deviant and task-oriented behavior if parental attention occurred anytime after the behavior up to the end of the 10-sec interval.

Since only a single behavior category could be recorded for the child in each 10-sec interval, the sum of the percentage of intervals the child was deviant, task-oriented, and unoccupied equalled 100% of the total intervals of the session.

Proportions of attention following a behavior were computed by dividing the number of intervals of that behavior to which the mother attended by the number of intervals of that behavior.

Mississippi

Task-oriented: For Edward, touching the assigned toy for any portion of an interval. For Joseph, any occurrence of writing the alphabet on the paper, pro-

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vided he was sitting properly at the table with both feet on the floor.

Deviant: Crying; screaming; tantrums; self-injury; demanding; arguing; threatening mother; hitting or tugging at mother; getting into mother's purse; throwing or destroying objects; kicking window or furniture; standing on or moving and dismantling furniture; playing with TV cable, door lock, or toy cabinet; hiding in corner or in toy cabinet; pressing against glass looking at observer; leaving room or attempting to leave the room; feet on wall or table; lying on table; baby talk; hiding toys; touching unassigned toy; writing on wall or table; scribbling on alphabet models; pounding pencil on table; placing materials on window so as to obstruct observer's view.

Unoccupied: absence of deviant or task-oriented behavior for entire 10-sec interval.

Both deviant and task-oriented behavior categories could be recorded only once each in an interval. Both categories could occur simultaneously and be scored in the same interval. Thus, the sum of each interval's deviant, task-oriented, and unoccupied behavior could be more than 100% of the total intervals of the session. Parent attention was recorded as following deviant or task-oriented behavior if it occurred during or immediately (within 3 sec) after that child behavior. Content of the attention, physical or verbal, was disregarded.

Proportion of attention for a behavior was computed as above.