ANALYSIS OF A HIGH-PROBABILITY INSTRUCTIONAL SEQUENCE AND TIME-OUT IN THE TREATMENT OF CHILD NONCOMPLIANCE

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This study evaluated the effectiveness of high-probability requests and time-out as treatments for noncompliance that appeared to be maintained by contingent attention in 2 developmentally normal children. The introduction of high-probability requests increased compliance for 1 child but not the other. Time-out was effective with both children, and improvements in compliance were maintained at an 8-week follow-up.

DESCRIPTORS: noncompliance, behavioral momentum, time-out, functional assessment

A variety of operant procedures have been demonstrated to be effective as treatments for child noncompliance. These include time-out, guided compliance, and response cost contingent on noncompliance (e.g., Handen, Parrish, McClung, Kerwin, & Evans, 1992; Little & Kelley, 1989) and tangible reinforcement contingent on compliance (e.g., Russo, Cataldo, & Cushing, 1981). However, with few exceptions, researchers have not conducted functional analyses to identify the reinforcers that maintain child compliance and noncompliance (e.g., Reimers et al., 1993).

Antecedent manipulations, such as the use of clear, direct commands, have also been shown to affect child noncompliance (e.g., Forehand & McMahon, 1981). Another antecedent approach involves issuing a sequence of high-probability (high-p) requests immediately prior to a low-probability (low-p) request to increase compliance to low-p requests. According to Mace et al. (1988), the high-p requests establish a "momentum" of compliance that persists when the low-p request is presented. Mace et al. (1988) showed that the use of high-p requests increased compliance in mentally retarded adults. Subsequently, Mace and Belfiore (1990) found that the high-p sequence reduced escape-motivated stereotypy and increased compliance in a mentally retarded adult. Consistent with these findings, Davis, Brady, Williams, and Hamilton (1992) demonstrated the effectiveness of the high-p sequence with noncompliance in mentally retarded children. Although the use of high-p requests seems promising for the treatment of noncompliance, the effectiveness of the procedure has been demonstrated only with mentally retarded children and adults. In addition, researchers have not demonstrated how the function of compliance or noncompliance is related to the effectiveness of the high-p request procedure.

The purpose of the present study was to determine whether the high-p request procedure would also increase compliance to low-p requests in 2 developmentally normal children. A second purpose was to assess the function of the children's noncompliance and to evaluate the effectiveness of time-out compared to that of the high-p sequence.

METHOD

Subjects and Setting

Two developmentally normal 4-year-old girls, Morgan and Annie, and their mothers participated in the study. The mothers volunteered to participate because their daughters were frequently noncompliant to routine requests. All assessment and treatment sessions were conducted in the home.

Data Collection

We recorded child compliance in response to both high-p and low-p requests, and two parent responses—attention and praise—during continuous 10-s intervals. *Compliance* was defined as initiation of the requested task within 20 s and completion of the task within 30 s of initiation. *Attention* was defined as any verbalization the parent made to the child following noncompliance. *Praise* was defined as any positive statement the parent made to the child following compliance. A second observer independently recorded child and parent behaviors during 30% of the sessions across all phases. Mean interobserver agreement percentages (overall, occurrence, and nonoccurrence) ranged from 91% to 100%.

Experimental Design

We used a multiple baseline across subjects design with an ABAC within-subject design replicated across subjects (A = baseline, B = high-p sequence, and C = time-out).

Procedure

Prior to baseline, we interviewed the mothers and then conducted three behavioral observations to assess the function of each child's noncompliance. During observation sessions, the mother was instructed to make 10 typical requests and to respond to her child as she normally would. Morgan was noncompliant in 87% of trials, and Annie was noncompliant in 50% of trials. The mothers provided verbal attention (repeated requests, scolding, pleading, reprimands, etc.) in 100% of the trials with noncompliance. This was consistent with information from the interviews.

Also prior to baseline, we developed lists of 12 low-p requests and 12 high-p requests with each mother. Low-p requests consisted of tasks the child could complete in 30 s (e.g., put your glass in the sink). Each mother reported that her child frequently refused to comply with these requests. High-p requests were simple, one-step commands (e.g., touch your nose). The parents were instructed to make each of these requests and, if the child complied immediately, the request was considered to be high p.

Baseline. In each session during baseline and all subsequent phases, the mother delivered five to eight low-p requests chosen at random from the list. Following each request, we recorded child and parent behaviors for 60 s or until the child complied with the request. We instructed the mother to make each request only once, to praise the child for compliance, and to ignore noncompliance. One minute elapsed between trials.

High-p sequence. In each trial, the parent issued a sequence of three high-p requests, 5 s apart, immediately prior to the low-p request. For each session, high-p and low-p requests were selected at random from the lists. This condition was identical to baseline in all other ways. Compliance with each low-p and high-p request was praised, and noncompliance with low-p and high-p requests was ignored. If a child was noncompliant to the third high-p request, additional high-p requests were issued until the child complied to one, and then the low-p request was issued.

Time-out. We chose time-out as a comparison procedure because of the convincing evidence in the literature for its effectiveness and because each child's noncompliant behavior appeared to be maintained by contingent attention. The same pool of low-p requests used in previous phases was utilized. Requests were issued only once. Contingent on noncompliance, the parent took the child by the hand and placed the child in a chair in another room. Time-out duration was 1 min with a 10-s delay (the child had to sit quietly for the last 10 s). The mother implemented time-out only when researchers were present in the home. Following the last session of the time-out phase, the parent was instructed to use time-out as a consequence for noncompliance in the absence of the researchers.

Follow-up. Observations were conducted at 2, 4, and 8 weeks following the end of the time-out phase to determine whether improvements in the child's behavior would be maintained when the parent implemented the procedure on her own.
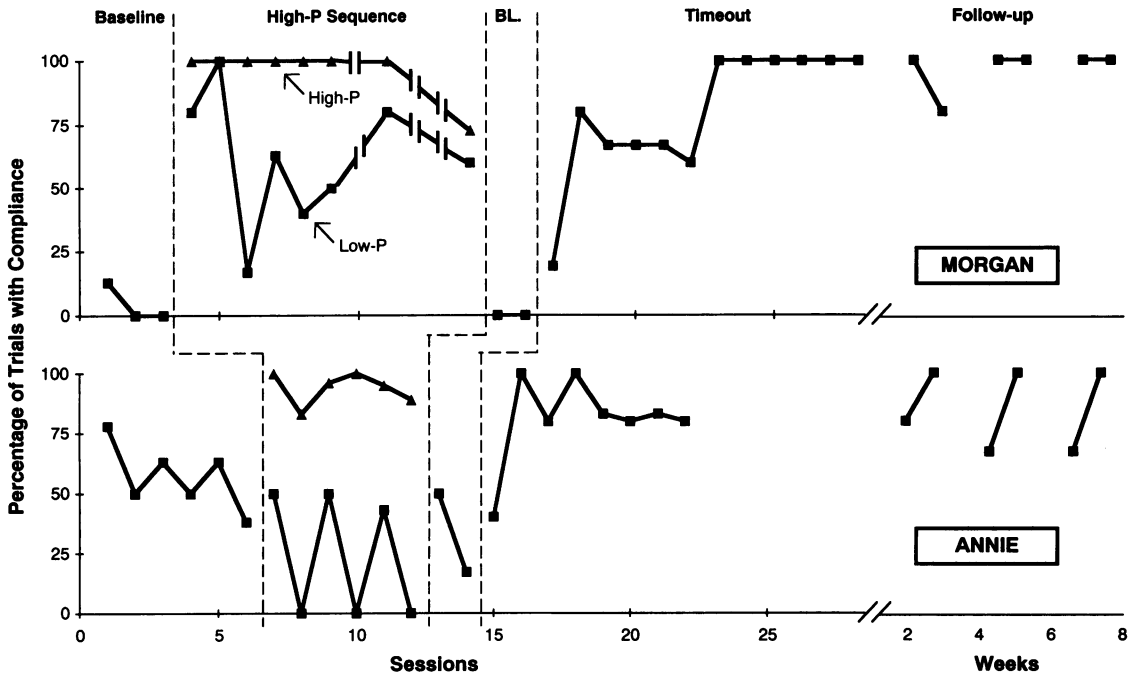
Figure 1. Percentage of compliance with low-*p* and high-*p* requests for Morgan and Annie during baseline, high-*p* sequence, time-out, and follow-up sessions. Data are missing in Sessions 10, 12, and 13 for Morgan because she was so noncompliant to high-*p* requests that the minimum number of trials (five) with low-*p* requests could not be conducted.

RESULTS AND DISCUSSION

Figure 1 shows the percentage of trials with compliance for both subjects. For Morgan, the presentation of high-*p* requests increased compliance with low-*p* requests from a baseline mean of 4% to a mean of 61%. Following a return to baseline, time-out further increased compliance to a mean of 80% (although it stabilized at 100% by the end of the phase). At follow-up, compliance remained near 100%. For Annie, the high-*p* requests resulted in a decrease in compliance with low-*p* requests from a baseline mean of 57% to a mean of 24%. After the second baseline ($M = 34\%$), time-out increased compliance to a mean of 81% and maintained it at this level at follow-up. Annie was highly compliant to the high-*p* requests ($M = 94\%$). Morgan was compliant with high-*p* requests initially but became less compliant in the second half of the phase, such that three sessions had to be terminated because the minimum of five low-*p* requests could not be delivered. Our data showed

that the mothers implemented the procedures as instructed. They praised compliance, ignored noncompliance, and implemented time-out with 98% to 100% accuracy.

The present, albeit preliminary, results do not provide strong support for the use of the high-*p* sequence with developmentally normal children. First, the procedure did not increase compliance for Annie, even though she was highly compliant with the high-*p* requests. Second, although compliance with low-*p* requests increased for Morgan when the high-*p* sequence was implemented, the procedure became difficult to implement because she was noncompliant with the high-*p* requests in later sessions. We also found the high-*p* sequence difficult to implement with a 3rd subject (a 5-year-old boy) whose data are not reported. Despite our best efforts to develop a pool of high-*p* requests for this child, he was compliant with only 30% of the requests identified as high *p*; thus, the procedure could not be implemented properly with him. More research is needed to analyze the variables that may con-

tribute to the effective implementation of the high-*p* sequence with developmentally normal children.

One limitation of this study is that we used a descriptive rather than a functional analysis to identify the reinforcer for noncompliance in our subjects. In a functional analysis, potential reinforcers are manipulated to establish a causal relationship between one or more of the reinforcers and the behavior (Iwata, Dorsey, Slifer, Bauman, & Richman, 1982). In spite of this limitation, the results obtained during treatment were consistent with the assessment data suggesting that noncompliance was maintained by contingent attention in these 2 children. Compliance for both children increased when noncompliance produced time-out from attention.

In the present study, the use of high-*p* requests had inconsistent effects on noncompliance that appeared to be maintained by attention in 2 normal children. These results are at odds with previous findings demonstrating the effectiveness of the high-*p* sequence (Davis et al., 1992; Mace & Belfiore, 1990; Mace et al., 1988). However, except for Mace and Belfiore (1990), who found that noncompliant behavior (stereotypy) in 1 subject was escape motivated, it is not clear what accounted for the subjects' low level of compliance in previous studies. Zarcone, Iwata, Hughes, and Vollmer (1993) recently evaluated the effectiveness of a high-*p* sequence with and without extinction of escape-motivated self-injury in a profoundly retarded adult. They showed that the high-*p* sequence was not effective in increasing compliance when reinforced escape behavior competed with compliance. Taken together, results from the present study and those reported by Zarcone et al. suggest that the function of both noncompliant behavior and other competing behavior, as well as the presence of other active treatments, are important considerations in analyzing the high-*p* sequence. More research is needed to understand the conditions under which high-*p* requests produce increases in compliance with low-*p* requests. Important in such research will be func-tional analyses of compliant and noncompliant behaviors.

REFERENCES

Davis, C. A., Brady, M. P., Williams, R. E., & Hamilton, R. (1992). Effects of high-probability requests on the acquisition and generalization of responses to requests in young children with behavior disorders. *Journal of Applied Behavior Analysis, 25,* 905–916.

Forehand, R., & McMahon, R. J. (1981). *Helping the noncompliant child: A clinician's guide to parent training.* New York: Guilford.

Handen, B. L., Parrish, J. M., McClung, T. J., Kerwin, M. E., & Evans, L. D. (1992). Using guided compliance versus time-out to promote child compliance: A preliminary comparative analysis in an analogue setting. *Research in Developmental Disabilities, 13,* 157–170.

Iwata, B. A., Dorsey, M., Slifer, K., Bauman, K., & Richman, G. (1982). Toward a functional analysis of self-injurious behavior. *Analysis and Intervention in Developmental Disabilities, 2,* 3–20.

Little, L. M., & Kelley, M. L. (1989). The efficacy of response cost procedures for reducing children's noncompliance to parental instructions. *Behavior Therapy, 20,* 525–534.

Mace, F. C., & Belfiore, P. (1990). Behavioral momentum in the treatment of escape-motivated stereotypy. *Journal of Applied Behavior Analysis, 23,* 507–514.

Mace, F. C., Hock, M. L., Lalli, J. S., West, B. J., Belfiore, P., Pinter, E., & Brown, D. K. (1988). Behavioral momentum in the treatment of noncompliance. *Journal of Applied Behavior Analysis, 21,* 123–141.

Reimers, T., Wacker, D., Cooper, L., Sasso, G., Berg, W., & Steege, M. (1993). Assessing the functional properties of noncompliant behavior in an outpatient setting. *Child and Family Behavior Therapy, 15(3),* 1–15.

Russo, D. C., Cataldo, M. F., & Cushing, P. J. (1981). Compliance training and behavioral covariation in the treatment of multiple behavior problems. *Journal of Applied Behavior Analysis, 14,* 209–222.

Zarcone, J., Iwata, B., Hughes, C., & Vollmer, T. (1993). Momentum versus extinction effects in the treatment of self-injurious escape behavior. *Journal of Applied Behavior Analysis, 26,* 135–136.