

*EFFECTS OF ANTECEDENT VARIABLES ON
DISRUPTIVE BEHAVIOR AND ACCURATE RESPONDING IN
YOUNG CHILDREN IN OUTPATIENT SETTINGS*

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The effects of manipulations of task variables on inaccurate responding and disruption were investigated with 3 children who engaged in noncompliance. With 2 children in an outpatient clinic, task directives were first manipulated to identify directives that guided accurate responding; then, additional dimensions of the task were manipulated to evaluate their influence on disruptive behavior. With a 3rd child, similar procedures were employed at school. Results showed one-step directives set the occasion for accurate responding and that other dimensions of the task (e.g., preference) functioned as motivating operations for negative reinforcement.

DESCRIPTORS: noncompliance, brief experimental analysis, motivating operations, discriminative stimuli

Childhood noncompliance, a common concern for parents, has been defined as a child purposefully not completing a task request (Kalb & Loeber, 2003). In contrast, to purposefully complete a task, a child must have both the skill (e.g., receptive language) and motivation to do so (Richman et al., 2001). Altering dimensions of task directives has been shown to differentially affect children's ability to respond accurately (Richman et al.). Other studies that have focused on the variables influencing the motivation to comply have shown that altering antecedent task dimensions (e.g., choice) can decrease rates of problem behavior even when access to negative re-

inforcement is available (McComas, Hoch, Paone, & El-Roy, 2000).

Task directives that set the occasion for accurate responding have been conceptualized as discriminative stimuli (S^D s) in that they may signal the availability of reinforcement (e.g., praise, removal of a completed task) contingent on emitting an accurate response (e.g., Richman et al., 2001). These directives are related to the skill required to discriminate task requirements for compliance. Task dimensions that affect disruptive behavior have been conceptualized as motivating operations (e.g., Call, Wacker, Ringdahl, Cooper-Brown, & Boelter, 2004) and are related to the motivation to complete a task. To understand more precisely why noncompliance occurs, individual analyses of both S^D s that set the occasion for accurate responding and motivating operations (MOs) that affect disruptive behavior are needed. Assessing both S^D s and MOs can be difficult when there are time restrictions such as those imposed in outpatient clinic or school settings. Brief experimental analyses have been developed

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in these settings to show the responsiveness of behavior to environmental events (e.g., Cooper, Wacker, Sasso, Reimers, & Donn, 1990) and to identify task directives that occasion accurate responding (e.g., McComas *et al.*, 1996). However, similar evaluations of both S^Ds and MOs have not been reported in the literature. The purpose of the current study was to develop a brief experimental analysis to identify antecedent variables that affect response accuracy and disruptive behavior during the presentation of task demands.

METHOD

Setting, Participants, and Response Definitions

Three children participated in the current study. Two children were evaluated in an outpatient behavioral pediatrics clinic (see Cooper *et al.*, 1992, for a description of the clinic), and 1 child (Beto) was evaluated during a regularly scheduled visit to his school. James was a 4-year-old boy who had been diagnosed with attention deficit hyperactivity disorder (ADHD) and had a history of speech delays. Marcus was a 3-year-old boy who had been diagnosed with congenital hypothyroidism, ADHD, and mild developmental delays including speech delays. Beto was a 6-year-old boy who had been diagnosed with autism. All children had been referred for disruptive behavior associated with the presentation of task demands. For all analyses, *disruptive behavior* was recorded when the child engaged in aggression, destruction, verbal refusal, or did not attempt to complete the task within 5 s. *Accurate* (behavior matching the directives) and *inaccurate* (behavior not matching the directives) responding was also recorded.

Data Collection and Interobserver Agreement

Data on accuracy for all children were recorded across trials (i.e., task presentation and a response). Interobserver occurrence agreement was calculated on a trial-by-trial basis, dividing the total number of agreements

across trials by the sum of the number of agreements and disagreements and multiplying by 100%. For James and Marcus in Phase 1, data on the presence or absence of disruptive behavior were collected using the same trial-by-trial procedure as for accuracy. In Phase 2 for James and Marcus, a 10-s partial-interval data-recording system was used to collect data on disruptive behavior across 5-min sessions. For Beto, a 6-s partial-interval data-recording system was used to collect data on disruptive behavior. Interobserver agreement was calculated using an exact interval-by-interval system by dividing the total number of agreements on the occurrence of disruptive behaviors by the total number of agreements and disagreements and multiplying by 100%. During interobserver agreement checks, two trained clinic staff members simultaneously but independently collected data. For James and Marcus, agreement data were gathered on disruptive behavior for 50% and 75% of the sessions in Phase 1 and for 57% and 40% of the sessions in Phase 2, and on accuracy for 70% and 50% of sessions in which tasks were presented across both phases, respectively. Mean agreement for disruptive behavior in Phase 1 was 90% (range, 80% to 100%) and 100%, and in Phase 2 it was 85% (range, 78% to 100%) and 80% (range, 70% to 90%) for James and Marcus, respectively. Mean agreement for accuracy across both phases was 87% (range, 75% to 100%) and 95% (86% to 100%), respectively. For Beto, agreement data were gathered on disruptive behavior and accuracy for 100% of all sessions. Mean agreement was 94% (range, 86% to 100%) for disruptive behavior and 88% (range, 81% to 100%) for accuracy.

Experimental Design and Procedure

The analyses were conducted in one (Beto) or two (James and Marcus) phases. Phases were conducted within a multielement design described by Cooper *et al.* (1992). Preference was based on a clinic observation of toy engagement

or care provider report (details available from the first author).

For James and Marcus, the focus of Phase 1 was to identify task directives that set the occasion for accurate responding (i.e., skill component). To collect accuracy data, it was important for each child to attempt the tasks. To reduce the possibility that the child would refuse the task and engage in disruptive behavior maintained by negative reinforcement (i.e., motivation component), an unfamiliar therapist (Ringdahl & Sellers, 2000) presented one-step or three-step task directives with visual cues, praise was delivered for attempting to complete each task, and no programmed consequences were provided for disruptive behavior (Richman et al., 2001). The types of task directives were alternated across sessions, with each session consisting of five trials. All tasks required the manipulation of a preferred play item (i.e., toy bug for James and toy car for Marcus).

The focus of Phase 2 was to identify antecedent variables (e.g., parent as therapist and preference of task materials) that potentially functioned as MOs for negative reinforcement and to assess if they interacted with variables identified in Phase 1 as setting the occasion for accurate responding. During this phase, parents presented the same types of task directives as in Phase 1, and negative reinforcement in the form of brief breaks was provided for disruptive behavior on a fixed-ratio 1 schedule. Tasks were presented in 5-min sessions. For James and Marcus, Phase 2 began with a free-play session in which each child had free access to toy items and parental attention. Next, the effects of the number of steps in the directives and the preference of the toy item on accuracy and disruptive behavior were evaluated (James only). Due to a substantial increase in Marcus' disruptive behavior when one-step directives with preferred tasks were presented by one of his parents, no other variables were evaluated. For Beto, only procedures similar to Phase 2 for James and Marcus were implemented. A

teacher's aide presented him with either one- or three-step directives to complete a nonpreferred work task (i.e., writing activities, art activities, etc.).

RESULTS AND DISCUSSION

The results for James' analysis are presented in the top panel of Figure 1. During Phase 1, James responded accurately to all one-step task directives, he was less accurate when presented three-step directives ($M = 30\%$), and he did not engage in disruptive behavior. In Phase 2, he responded accurately to the majority of the one-step task directives with preferred items ($M = 94\%$) and engaged in little disruptive behavior ($M = 3\%$). His accuracy decreased (17%) when three-step directives were presented, and disruptive behavior increased (37%). When one-step directives with the nonpreferred item were presented, accuracy was high ($M = 72\%$), but disruptive behavior was also elevated ($M = 29\%$). The results for Marcus' analysis are presented in the middle panel of Figure 1. During Phase 1, he responded similar to James for accuracy (one-step task directives, $M = 90\%$; three-step task directives, $M = 10\%$) and did not engage in disruptive behavior. During Phase 2, when Marcus was given one-step task directives with the preferred toy item, he was never accurate and engaged in high levels of disruptive behavior ($M = 81\%$). The results for Beto's analysis are presented in the bottom panel of Figure 1. He responded accurately to the majority of the one-step directives ($M = 88\%$) and to a minority of the three-step directives ($M = 15\%$). He did not engage in disruptive behavior during the presentation of the one-step directives but did when three-step directives were presented ($M = 38\%$).

Collectively, these results replicate those of Richman et al. (2001) by demonstrating a methodology to identify quickly the stimulus characteristics of directives that guide accurate responding. In addition, the increase in disrupt-

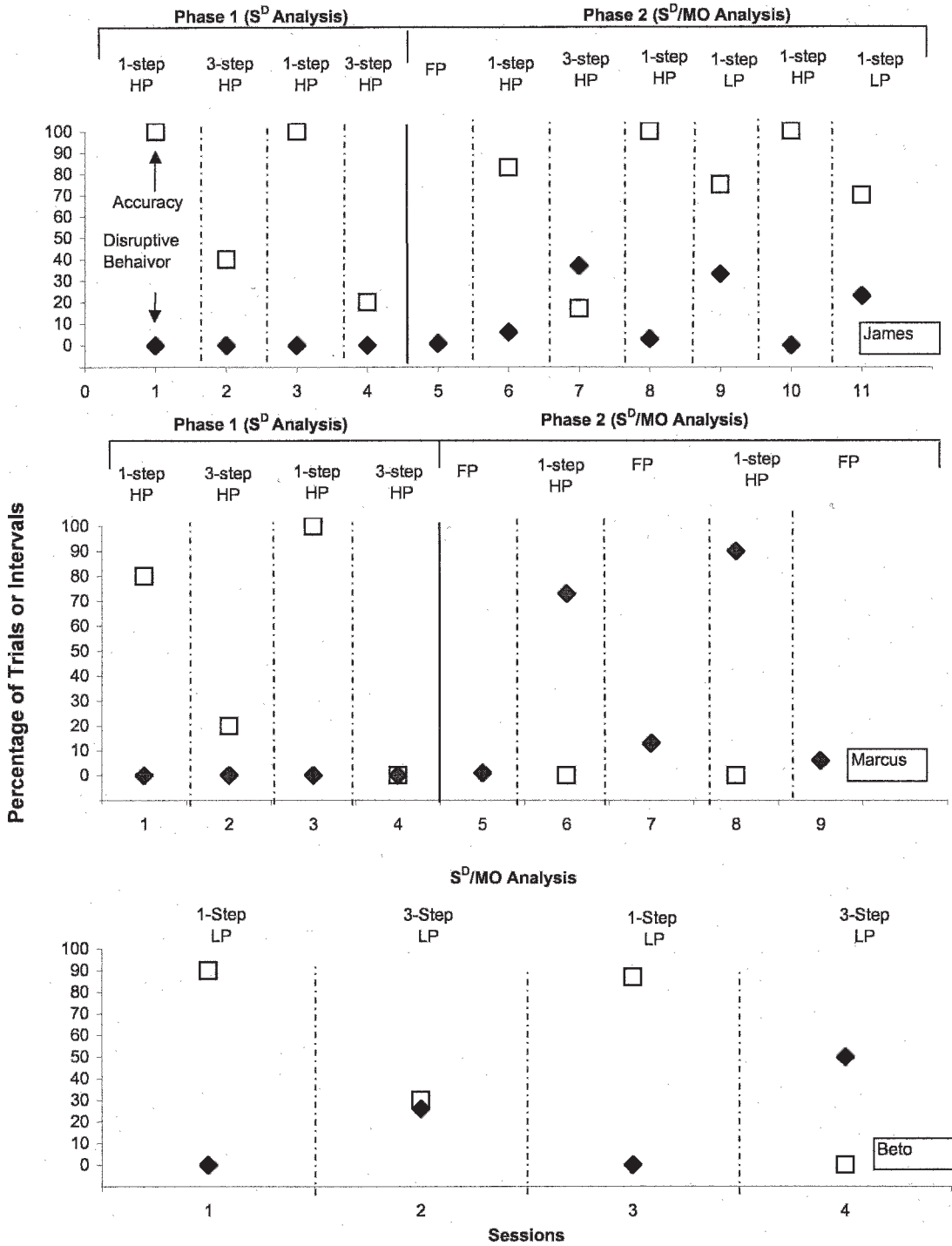


Figure 1. Results of analyses showing the effects of task directives on accurate responding (Phase 1, S^D analysis) and the effects of the presence of parents, task preference, and task directives on accuracy and disruptive behavior (Phase 2, S^D and MO analysis). A 10-s partial-interval recording system was used for James and Marcus, and a 6-s partial-interval recording system was used for Beto. FP = free play; HP = high-preference item; LP = low-preference item.

tive behavior observed in Phase 2 for James suggests that the preference of the toy item in isolation or combined with the presence of his parents functioned as an MO for negative reinforcement during 5-min sessions when access to work breaks was contingent on disruptive behavior. Although preference affected disruptive behavior, it had only marginal effects on accuracy. For Marcus, the one-step task directives shown to guide accuracy in Phase 1 did not do so in Phase 2. One explanation for these results is that Marcus' engagement in disruptive behavior was incompatible with accurate responding. Marcus responded to parental directives by throwing toys. This response was scored as both disruptive and inaccurate. Due to the manipulation of multiple variables (i.e., parents, session duration, and negative reinforcement) in Phase 2, it is not possible to identify the exact antecedent or consequent variables that affected Marcus' behavior. However, the same tasks were presented to him using directives shown in Phase 1 to guide accurate responding, which suggests that the variables that affected his behavior in Phase 2 were related to motivation rather than skill. For Beto, the presentation of three-step nonpreferred task directives appeared to function as an MO for negative reinforcement. A similar finding was shown for James in Phase 2 (Session 7), but it was not replicated.

Although the influence of task directives in guiding accurate responding (e.g., Richman et al., 2001) and the influence of task variables in altering motivation (e.g., McComas et al., 2000) each have been demonstrated in isolation, no investigations have focused on the interaction between these two variables. In the current study, the influence that antecedent variables had on two types of behavior associated with noncompliance (inaccurate responding and disruption) was investigated, and each variable was linked conceptually to a distinct operant mechanism. Accurate responding was linked to stimulus control, and

the directives provided were conceptualized as S^Ds based on Richman et al. Disruptive responding was linked to MOs and was analyzed under negative reinforcement conditions. Thus, the presence of a care provider, the number of steps in a directive, and the preference of tasks were all evaluated as potential components of an MO that affected a child's motivation to escape the task based on McComas et al. (2000). However, multiple variables, both antecedent and consequent, were simultaneously manipulated within some analyses (e.g., Phase 2 for Marcus) and did not permit the individual evaluation of each independent variable as a potential MO for negative reinforcement. Future research using these procedures should alter antecedent variables individually to evaluate their effects on behavior. An additional limitation is that the current study focused on assessment rather than treatment. A logical extension to this line of research is to evaluate the effectiveness of treatments based on these types of analyses.

In the current study, two classes of behavior (accuracy and motivation) required for compliance were shown to occur in individualistic ways across children. These results indicate that similar types of responses that are considered to constitute noncompliance may occur for different functional reasons and require different treatments. The present study provides preliminary evidence that it is important to assess both classes of antecedent variables with children who engage in noncompliant behavior and provides a brief methodology to do so.

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