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EFFECTS OF MOTIVATING OPERATIONS ON PROBLEM AND ACADEMIC BEHAVIOR IN CLASSROOMS

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The current study examined the effects of motivating operations on problem behavior and academic engagement for 2 students with autism. Classroom sessions were preceded by periods in which the participants had access or no access to the items functionally related to their problem behavior. Results suggested that presession access may result in lower levels of problem behavior and higher levels of academic engagement during classroom instruction.

Key words: problem behavior, autism, motivating operations

Motivating operations (MOs) are events that alter the value of reinforcement and the frequency of behavior previously correlated with such reinforcement (Laraway, Snycerski, Michael, & Poling, 2003). Recent research has focused on the incorporation of MOs into assessments and interventions to maximize the effectiveness of behavioral programming (e.g., Hanley, Tiger, Ingvarsson, & Cammilleri, 2009; McGinnis, Houchins-Juarez, McDaniel, & Kennedy, 2010). For example, O'Reilly et al. (2008) evaluated the effects of presession exposure to consequences (attention and tangible items) that maintained problem behavior for three adults with developmental disabilities immediately prior to leisure activities. Results indicated that problem behavior was reduced during those leisure activities that were preceded by access to the consequences that maintained problem behavior.

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In the current study, we examined the effects of presession exposure to items that maintained problem behavior for two children with autism in a school context. We hypothesized that presession exposure would reduce problem behavior during regular classroom routines. Immediately prior to classroom sessions, participants were exposed to one of two conditions: (a) presession access to items or (b) no presession access to items. The effects of these presession conditions were examined with respect to the occurrence of problem behavior and academic engagement during subsequent classroom activities.

METHOD

Participants and Settings

Participants were referred by their classroom teachers for problem behavior that appeared to be related to accessing preferred items and that interfered with academic engagement. Terry was a 5-year-old Caucasian boy who had been diagnosed with autism. Rusty was a 7-year-old Caucasian boy who had been diagnosed with autism, hypotonia, chronic otitis media, and congenital scoliosis. Both participants attended self-contained classrooms in private schools that served students with severe disabilities.

Prior Functional Analyses

Prior to this study, functional analyses (Iwata, Dorsey, Slifer, Bauman, & Richman, 1982/1994) were conducted with each participant (data available from the first author). Each student was exposed to five 10-min sessions of each of four conditions including attention, demand, tangible, and play. Results of the functional analyses showed that Terry engaged in problem behavior only during the tangible condition (M = 67%, range, 57% to 80%), whereas Rusty's problem behavior occurred primarily in the tangible (M = 78%, range, 47% to 100%) and demand (M = 74%, range, 63% to 93%) conditions.

Response Measurement and Reliability

Terry's target problem behavior was throwing objects (i.e., object launched from hand). Rusty's target behavior was inappropriate vocalizations in the form of a repeated sound "eeee." Academic engagement was defined as being appropriately involved with the instructional materials or with teachers or peers during classroom sessions (see O'Reilly, Sigafoos, Lancioni, Edrisinha, & Andrews, 2005). Academic engagement included working on puzzles, looking through picture books, and placing pegs into a pegboard. Observers collected data during regular classroom activities using 10-s partial-interval recording for problem behavior and 10-s whole-interval recording for academic engagement. A second independent observer scored problem behavior and academic engagement for each participant on an interval-by-interval basis for 36% of sessions. Interobserver agreement was calculated by dividing the number of agreements by the total number of agreements plus disagreements in each session and multiplying by 100%. Mean agreement for Terry's problem behavior and academic engagement was 96% (range, 93% to 100%). For Rusty, mean agreement for problem behavior was 94% (range, 91% to 98%) and mean agreement for academic engagement was 93% (range, 91% to 98%).

Presession Conditions

Immediately prior to the classroom sessions, the participants were exposed to one of two conditions: (a) presession access to items or (b) no presession access to items. Only the experimenter, observers, and participant were present during the presession access condition. Terry's presession access to items occurred in his classroom. Rusty's presession access to items occurred in an empty classroom adjacent to his regular classroom. During these periods, classroom materials (e.g., books and blocks) were present in the room. In addition, the participants had continuous access to preferred items (i.e., blank white paper plus crayons for Terry

and a musical book for Rusty). These items were reported by both students' teachers as being associated with problem behavior in the classroom and were subsequently evaluated in a paired-choice preference assessment (Fisher et al., 1992). Access to these items was shown to maintain problem behavior in the functional analyses.

During the presession access sessions, observers collected data on each participant's rejection of the item (O'Reilly et al., 2009). Rejection behaviors for each participant were defined based on teacher report. For Terry, rejection included transferring the crayons to his nondominant hand while manipulating other items with his dominant hand. For Rusty, rejection consisted of dropping the musical book without an attempt to pick it up within 3 s. When the participant rejected the item, the experimenter re-presented it and encouraged the participant to play with it. This procedure continued until the participant had rejected an item three times. Following the third rejection, the experimenter terminated the presession access session and initiated the classroom session (see below). The mean duration of presession access was 45 min (range, 40 to 52 min) and 22 min (range, 11 to 35 min) for Terry and Rusty, respectively.

In the no presession access condition, the participant continued through his typical school routine but the preferred item was not present in the classroom for a minimum of 2 hr prior to the classroom session.

Classroom Sessions

The children's teachers reported that both participants engaged in problem behavior during academic activities when preferred items were in sight but unavailable. Only one 20-min classroom session was conducted per day, and classroom sessions occurred in the context of the participants' typical instruction. During these sessions, three to four students were seated with the participant at a table, and all had access to instructional materials (e.g., puzzles, books, counting games). The teacher modeled appropriate engagement with the materials but provided no prompts to engage with the materials; this represented typical classroom instruction. The same materials were used in all classroom sessions. The teacher delivered praise to the participant on a fixed-time 30-s schedule. Each participant's preferred item was placed in its typical location in the classroom, making the item visible but not accessible during the session. For example, Terry's paper and crayons were located on a nearby table, and Rusty's musical book was placed on a nearby bookshelf. The teacher blocked attempts to access the items by moving the items out of reach or by placing herself between the participant and the item. Sessions following presession and no presession access were compared in a multielement design.

RESULTS AND DISCUSSION

The results of the presession MO manipulation on problem behavior and academic engagement are presented in Figure 1 for Terry and Rusty, respectively. Both participants displayed lower levels of problem behavior in the classroom during those sessions that were preceded by access to items (M = 20%, range, 1% to 38%) than in sessions that were not preceded by access (M = 61%, range, 21% to 89%). Participants engaged in higher levels of academic engagement following presession access (M = 83%, range 65% to 99%) than in no presession access (M = 31%, range, 4% to 65%).

Providing the participants with presession access to items likely decreased the value of the items during subsequent classroom sessions, which resulted in a corresponding decrease in the frequency of problem behavior previously correlated with obtaining these items. Increases in academic engagement were an unforeseen but positive side effect of the presession access manipulation. The reason for the increase in academic engagement is unclear. It is possible that the preferred items no longer posed a

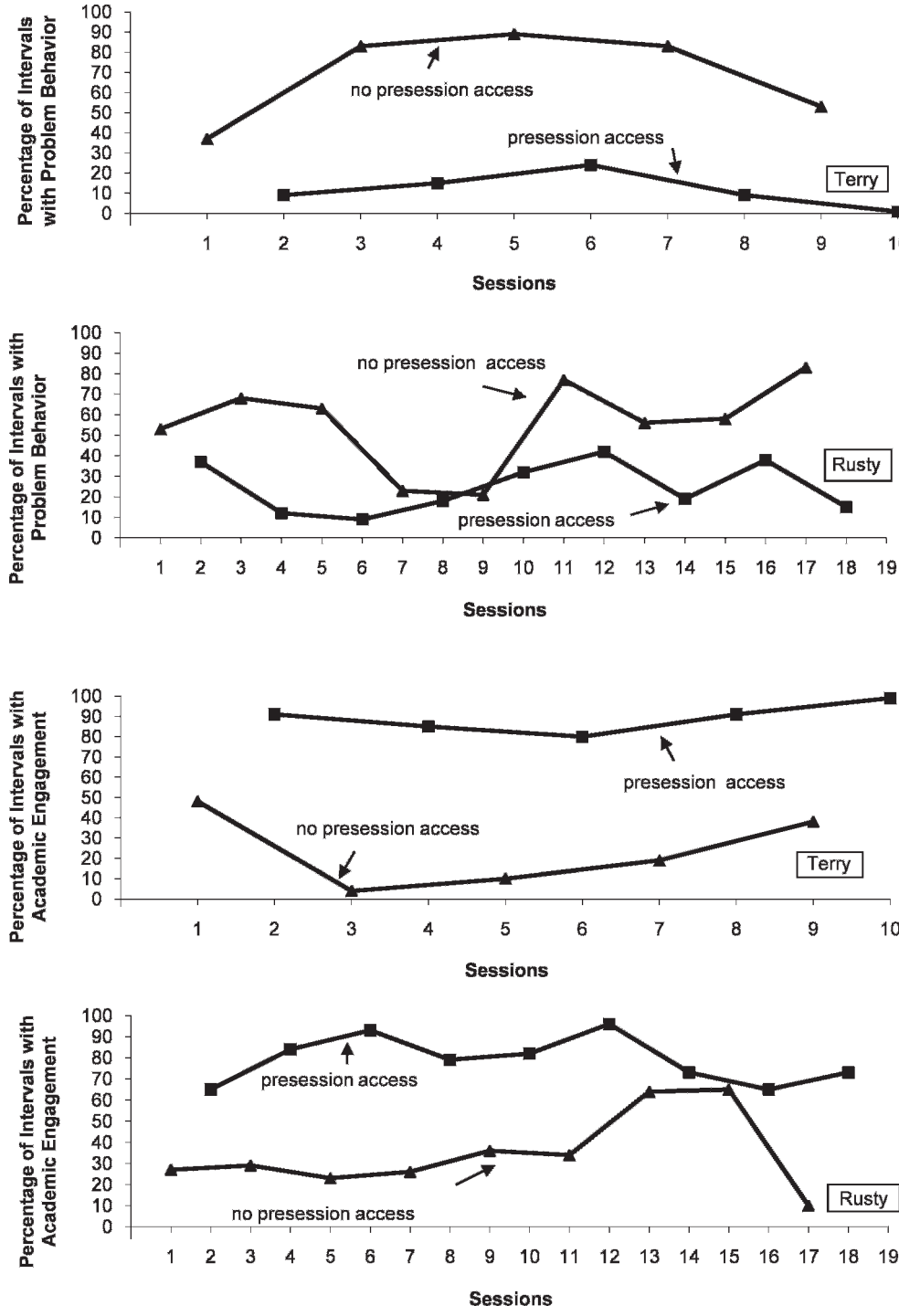

Figure 1. Percentage of intervals with problem behavior (top two panels) and academic engagement (bottom two panels) for both participants.

distraction in the classroom (the rejection criteria used in the presession access condition was indicative of a satiation effect). In addition, the decrease in problem behavior may have permitted the participants to contact the reinforcers that were associated with academic engagement in the classroom context (e.g., interaction with classroom materials). In this respect, the current results are similar to those of Berg et al. (2000), who suggested that noncontingent access to reinforcement prior to the classroom session may reduce the establishing operation for problem behavior. Future research should further examine the influence of MO manipulations on academic engagement.

One limitation of this study was that participants were not exposed to task demands immediately prior to the classroom sessions during the presession access condition, whereas they received typical classroom demands during the no presession access condition. This manipulation might have accounted for differences in problem and academic behavior in the two conditions. That is, the additional presentation of demands in the no presession access condition could have increased the relative MO for item interaction (due to a longer level of deprivation) or it could have occasioned more escape-related problem behavior (particularly for Rusty, whose problem behavior was also maintained by escape from demands). Future research could address this limitation by including demands during the presession conditions. For example, presession conditions could include instruction in which the participant receives the items as a reinforcer for correct responses. Alternatively, participants could be placed in the same room for both presession conditions (access and no access) such that only the presence of the preferred item is manipulated.

The current study used behavioral indicators of satiation (rejection responses; O'Reilly et al., 2009) rather than a specific length of time to determine when the presession access condition should be terminated. Behavioral indicators of satiation provide a more sensitive measure than merely exposing the participant to the reinforcing stimuli for a predetermined period of time. However, the findings from this study raise important questions regarding the practicality of implementing presession access as an adjunct to an intervention for problem behavior. First, the duration of access necessary to produce satiation likely will vary within and across individuals. In the current study, the participants required a mean of 45 min (Tony) and 22 min (Rusty). Such lengthy durations may be unwieldy in many applied settings. Future research should examine variations that pertain to the termination of presession access (e.g., using one rejection response as an indicator of satiation instead of three), which could enhance the applicability of presession access interventions in natural environments.

This study focused on the short-term effects of the MO on problem behavior and academic engagement during 20-min classroom sessions. Thus, questions remain as to the effects of presession access over longer periods of time (i.e., postsession). Future research should examine how long satiation effects last over the course of the day and what the corresponding implications are for treatment effectiveness. In addition, future research should examine whether similar results would be obtained for behavior maintained by other forms of positive reinforcement (i.e., attention) or by negative reinforcement.

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