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ANTECEDENT EFFECTS OF OBSERVING PEER PLAY

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The relative reinforcing value of toys was assessed in the absence of, and immediately following, participant observation of a peer manipulating one of the toys. Preference assessments were used to identify preference hierarchies. Reinforcer assessments were conducted with a high-preference item, a low-preference item, and a control. Each participant allocated responding toward the high-preference item during baseline. When reinforcer assessment sessions were preceded by a peer observation period, 3 of the 4 participants shifted allocation to the toy manipulated by the peer. The 4th participant shifted allocation only when the high-preference stimulus was replaced with a medium-preference stimulus. These data suggest that, among preschoolers, response allocation is influenced by observations of peers playing.

DESCRIPTORS: motivating operations, imitation, peer modeling, reinforcer assessment

Effective early education environments strive to minimize inappropriate behavior and promote maximum participation in beneficial classroom activities. Thus, an understanding of those variables that influence preschoolers' response allocation among activities is necessary for effective practice. Several studies have shown that preschoolers' response allocation is a function of consequences associated with available response options. Cuvo, Lerch, Leurquin, Gaffaney, and Poppen (1998) found that children allocated relatively more responding to a task associated with a denser schedule of reinforcement, even when that task was more challenging than an alternative. In addition, differential reinforcement schedules have been used to increase preschoolers' selection of initially nonpreferred (Betancourt & Zeiler, 1971) or novel (Cammilleri & Hanley, 2005) classroom activities.

Relatively little research has been devoted to identifying the influence of antecedent variables on preschoolers' response allocation. McAdam et al. (2005) demonstrated that preschoolers' selections during a preference assessment were influenced by presession deprivation or satiation, illustrating one example of the influence of motivating operations (Laraway, Snycerski, Michael, & Poling, 2003) on preschoolers' behavior. Another potentially influential antecedent variable in early education settings is peer behavior. For example, children often compete for the same toy even when duplicates of the toy are readily available—children want what their peers have (Caplan, Vespo, Pederson, & Hay, 1991). Thus, the relative value of classroom materials may be altered when children observe their peers manipulating those materials. We explored this possibility by conducting reinforcer assessment sessions in the absence of, and immediately following, a peer observation during which the peer manipulated one of the available items.

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METHOD

Participants and Setting

Four children participated in the study. All children were typically developing and attended a full-day early education program. Each participant also served as a peer for another participant. Dyads (the participant and his or her peer) were chosen based on teacher and/or parent report that the children frequently played together. Amy (2 years 2 months old) and Kerry (3 years 8 months old) were siblings and were assigned to a dyad, and Adam (2 years 5 months

old) and Larry (2 years 8 months old) were classmates who were assigned to a dyad. All sessions were conducted in a room equipped with an adjoining observation area. Reinforcer assessment sessions were 5 min in length (excluding reinforcer consumption time for Larry and Kerry) and were conducted once per day.

Data Collection and Interobserver Agreement

Trained undergraduate and graduate students served as experimenters and data collectors. Observers recorded selections during the preference assessments using paper and pencil. A selection was recorded if the participant touched an item within 5 s of the instruction, ''pick one.'' For each item, the number of selections was divided by the number of presentations and multiplied by 100% to determine the percentage chosen. A second independent observer simultaneously scored 100% of trials. Agreement was defined as both observers recording the same response for a trial. Percentage agreement was calculated by dividing the number of agreements plus disagreements and multiplying by 100%; mean agreement was 100% for all participants.

During the reinforcer assessment, the duration of in-zone behavior (i.e., the majority of the body inside a zone) was recorded and then divided by the total session length to determine the percentage of time in zone. The frequency of card placement (releasing a card into a container) was recorded and then divided by the session length to determine number of responses per minute. Interobserver agreement was assessed during a mean of 37% of sessions (range, 26% to 43% across participants). Agreement percentages were calculated by comparing observers' records on an interval-by-interval basis. The smaller duration (or number) of responses in each interval was divided by the larger number; these fractions were then averaged across intervals and multiplied by 100% to obtain a percentage agreement score. The mean agreement across participants was 95% (range, 88% to 100%).

Procedure

Preference assessment. A paired-choice preference assessment (Fisher et al., 1992) was conducted to identify high-preference (HP), low-preference (LP), and medium-preference (MP) stimuli for inclusion in the reinforcer assessment. Items were included based on parent and teacher reports of participants' preferences. During the preference assessment, each item was presented in a pair with every other item until all possible pairs had been presented once. For each trial, the selected item was delivered for 30 s.

Reinforcer assessment. Reinforcer assessments were conducted to determine the relative reinforcing effects of stimuli identified in the preference assessment. For Amy and Adam, stimuli were delivered contingent on in-zone behavior (Fisher et al., 1992). The session room was divided into three zones (1.2 m by 1.5 m) marked on the floor with tape. One zone contained the HP stimulus, one contained the LP stimulus, and one zone was empty (i.e., control). Each session began with the participant and experimenter standing outside the three zones, and the experimenter prompted the child to ''pick one.'' In-zone behavior resulted in continuous access to the corresponding stimuli and continuous experimenter attention (i.e., the experimenter entered the zone and played with the child), or no programmed consequences (i.e., control). Stimuli were randomly assigned to zones prior to each session, and sessions were conducted until the relative value of the HP and LP stimuli was determined.

For Larry and Kerry, the reinforcer assessment was modified to increase the response requirement. The session room was arranged as described above, but each zone contained a different-colored set of task materials. Each set consisted of five index cards and a rectangular container that were placed on the floor directly in front of the corresponding stimulus. Contingent on placing all five cards in the container, the child gained 30-s access to the HP or LP

stimulus and experimenter attention or no programmed consequences (control). The position of the HP and LP stimuli and their corresponding materials was randomly assigned before each session. At the beginning of each session the experimenter delivered the instruction to "pick one," and this instruction was reissued after each reinforcer access period.

Experimental Conditions

Baseline. Baseline reinforcer assessment sessions were conducted as described above.

Observation of peer play. Reinforcer assessment sessions occurred immediately after a period during which the participant observed a peer engaging with one of the stimuli (i.e., HP, LP, MP) available during the subsequent reinforcer assessment session. Prior to the observation period, an experimenter instructed the peer to play with one of two available stimuli (the peer always complied). The peer and experimenter then entered the room and the peer interacted with the designated stimulus for 2 min. The peer was never asked to complete the clean-up task. During the peer observation period, the participant observed through a one-way window with a second experimenter who briefly responded to any of his or her questions or comments. The second experimenter also made neutral statements about the toys (e.g., "They're racing the cars.") every 30 s to direct the participant's attention to the peer's actions. Following the 2-min peer observation period, the peer was escorted back to class and the participant was exposed to the reinforcer assessment procedures described above.

Experimental Design

A concurrent operants arrangement was used to determine the relative reinforcing value of stimuli presented during the reinforcer assessment. The effects of peer observation on response allocation during the reinforcer assessment were evaluated in a reversal design.

RESULTS AND DISCUSSION

For Amy, the HP stimulus was people and houses (chosen on 89% of trials) and the LP stimulus was dinosaurs (chosen on 22% of trials). For Adam, the HP stimulus was food and dishes (chosen on 89% of trials) and the LP stimulus was dinosaurs (chosen on 11% of trials). For Larry, the HP stimulus was cars and carwash (chosen on 100% of trials) and the LP stimulus was stacking cups (never chosen). For Kerry, the HP stimulus was markers and paper (chosen on 100% of trials), the LP stimulus was Mr. Potato Head® (chosen on 11% of trials), and an MP stimulus (bus and people; chosen on 56% of trials) was included as well.

Figure 1 depicts the reinforcer assessment results for all participants. Control selections were rare and were omitted from the graphs for ease of visual inspection. The results were highly consistent for Amy, Adam, and Larry. During baseline, responding was consistently allocated to the HP stimuli relative to the LP stimuli and control. During sessions following observation of a peer, substantially more responding was allocated to the stimuli manipulated by the peer during the observation.

The effects of peer observation were less robust for Kerry. During baseline, Kerry allocated substantially more responding to the HP stimulus. She continued to allocate responding to the HP stimulus after observing her peer interacting with the LP stimulus, suggesting that peer observation was not powerful enough to override her strong preference for the HP stimulus. The HP stimulus was then replaced with an MP stimulus, and Kerry allocated responding primarily to the MP stimulus. In subsequent sessions that followed peer observation, Kerry allocated responding primarily to the stimulus manipulated by the peer. Peer observations were insufficient to override Kerry's preference for the HP stimulus over the LP stimulus. Peer observations did alter the relative reinforcing value of the MP and LP

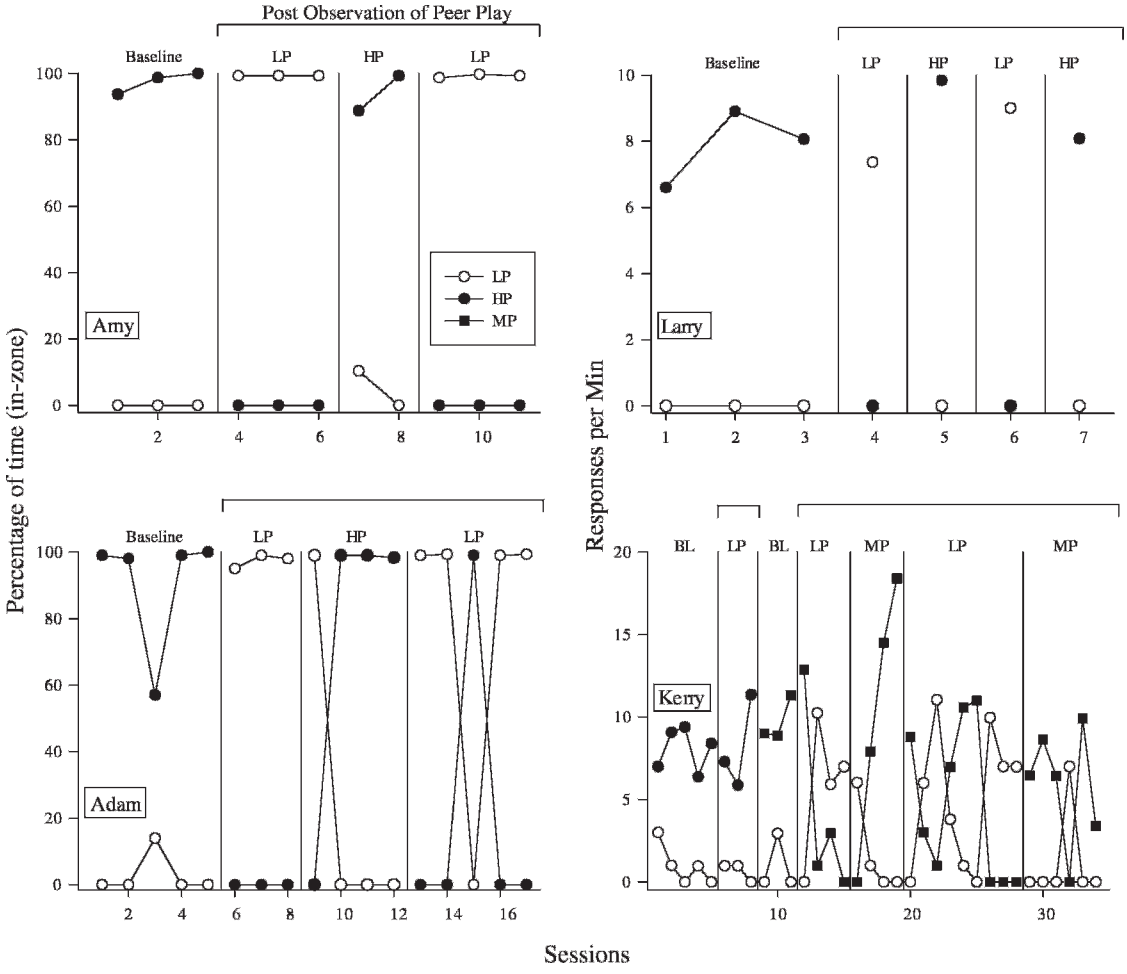

Figure 1. The percentage of time in zone during the reinforcer assessments is shown for Amy and Adam (left). Responses per minute during the reinforcer assessments are depicted for Larry and Kerry (right). Brackets indicate reinforcer assessments conducted after observation of peer play. Phase descriptors within the brackets indicate the item (HP, LP, or MP) manipulated by the peer.

stimuli, but results were less consistent than those obtained with the other participants.

These results add to a substantial literature that has examined the effects of peers on the behavior of young children by suggesting an additional conceptual framework for understanding peer influences. In most prior studies, peer behavior served as a discriminative stimulus that occasioned imitation (e.g., Nikopolous & Keenan, 2004; Werts, Caldwell, & Wolery, 1996). In the current study, children did not merely imitate their peers; they worked to gain access to stimuli with which their peers had engaged. Thus, it appears that peer observation served as a motivating operation, altering the value of toys presented during the reinforcer assessment.

However, a plausible alternative interpretation is that the opportunity to imitate a peer was itself a reinforcer that resulted in shifts in response allocation. To rule out this alternative account, one would need to provide access to the toy manipulated by the peer but prevent imitation of the peer's actions. Another potential limitation is that our study does not provide information regarding the characteristics of the

peer pair necessary for peer observation to influence response allocation. In addition, it is possible that preferences shifted as a result of the experimenter's statements, which were designed to direct the participant's attention to the peer's actions.

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