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Abstract

Reinforcer sampling has been demonstrated to increase correct academic responding during teaching sessions (Park, Pereia Delgado, Choi & Greer, 2008) and to increase the frequency of hospital patients exchanging tokens for reinforcing events (Ayllon & Azrin, 1968). Further research is warranted to evaluate the impact of pre-teaching events, such as reinforcer sampling, on subsequent performance of children with autism. The purpose of Study 1 was to compare academic skill acquisition, academic skill maintenance, and problem behavior with and without pre-session exposure to reinforcing stimuli. Two children diagnosed with autism participated in the study. Data were collected on percentage correct performance (acquisition and maintenance) and percentage of trials with problem behavior. Interobserver agreement (IOA) was assessed for 25% of sessions with agreement averaging 98.3% (range 95-100%). Pre-session exposure to reinforcers resulted in slower acquisition compared to the No-Exposure condition. Study 2 was designed to compare academic skill acquisition, academic skill maintenance, and problem behavior after varying amounts of pre-session exposure to reinforcing stimuli. Data for one participant suggest low levels of reinforcer sampling resulted in more rapid acquisition compared to High-Exposure and to No-Exposure. Problem behavior and academic skill maintenance were undifferentiated, although an unequivocal decrease of both behaviors was observed from baseline to treatment across studies. Results are discussed in terms of basic principles that may account for these findings and methodological differences that could have contributed to our failure to replicate the results of Park et al. (2008) in Study 1.

Effects of Pre-Session Exposure to Reinforcers on Correct Responding and Problem Behavior of Children with Autism

A commonly advised first step when introducing intensive behavior-analytic teaching procedures to children with autism is for therapists to deliver some number of time-based (i.e., "noncontingent") reinforcers before presenting demands (Barbera & Rasmussen, 2007). Reinforcer sampling has taken different forms in past research. Sampled stimuli may be identical to those delivered contingent upon behavior in subsequent sessions (Ayllon & Azrin, 1968) and sometimes sampled stimuli are presumed or demonstrated reinforcers that are not available during subsequent sessions (Park et al. 2008.). The process of a therapist providing access to reinforcing events and stimuli prior to teaching sessions has sometimes been referred to as "pairing" (Barbera & Rasmussen, 2007), "establishing the instructor as a positive conditioned reinforcer" (Rehfeldt & Rosales, 2007), and "reinforcer sampling" (Ayllon & Azrin, 1968, Park et al., 2008; Ramaswamy, 2005). Barbera and Rasmussen (2007) describe the process of associating the teaching environment, people, and materials with established reinforcers as an essential first step when setting up an early intensive behavior intervention program. These authors further recommend that therapists should provide pre-teaching access to reinforcers before the first session and throughout the intervention process with a particular student.

Reinforcer sampling is procedurally distinct from the pre-teaching intervention known as priming. Like reinforcer sampling, priming involves the teacher or therapist exposing the learner to stimuli that will be present at a later time. Unlike reinforcer sampling, priming involves low-demand, high-reinforcement practice trials related to the upcoming task. Priming has been used, for example, to increase spontaneous peer interactions initiated by children with autism (Zanolli, Daggett & Adams, 1996). Zanolli et al. conducted 10-14 priming trials for spontaneous interaction skills (e.g., looking at peers, saying peers' names, etc.) by prompting and reinforcing each target behavior immediately before an integrated group lesson (i.e., the target setting for children with autism to socialize). To summarize, priming involves the delivery of reinforcers contingent on behavior that should be occasioned in later sessions. Reinforcer sampling involves the delivery of pre-session reinforcers on a time-based schedule without the opportunity for the learner to practice target responses.

Reinforcer sampling has been demonstrated to increase responding of people with developmental disabilities. Ayllon and Azrin (1968) evaluated a reinforcer sampling procedure designed to increase the frequency with which hospital patients exchanged tokens for reinforcing events (i.e., going for a walk, watching a movie, and attending a music session). Participants were required to engage in each event for a brief period (3-5 min) every time the activity was available (e.g., twice weekly). After the sampling period, experimenters presented the opportunity for each participant to exchange a token for continued access to the sampled activity. The sampling procedure was effective in increasing the number of patients who exchanged tokens for each activity and the number of tokens exchanged per activity. This evocative effect has also been demonstrated with aberrant behaviors. Roantree and Kennedy (2006) demonstrated that 20 min of pre-session access to attention resulted in increased attention-maintained stereotypy in subsequent sessions.

Park et al. (2008) evaluated the effects of pre-session exposure to playful physical contact on academic performance. In a systematic replication of an unpublished dissertation (Ramaswamy, 2005) the investigators demonstrated that pre-instructional physical contact (tickling, spinning, and hugging) delivered for 10 s before every 10 learning trials increased the correct academic responding of preschool students with developmental disabilities compared to a condition without pre-session exposure. It is important to note when interpreting these results that the sampled playful physical contact was different from the consequences delivered contingent on correct academic responses (an edible). Reinforcers used during teaching sessions were not available during pre-session exposure sessions; therefore, a potential confound of reinforcer satiation was avoided by Park et al.

Researchers have also demonstrated abative effects of reinforcer sampling. Vollmer and Iwata (1991) demonstrated that simple motor responses (closing a switch or placing a block) reinforced with access to music decreased during sessions that were preceded by free access to music. This reinforcer sampling condition was described by Vollmer and Iwata as a satiation condition. Parameters such as duration of reinforcer access and amount of reinforcers available have also been evaluated. O'Reilly et al. (2009) compared the effects of three different pre-session conditions on problem behavior maintained by access to tangible items. High levels of problem behavior were observed in sessions preceded by conditions of brief access (i.e., continuous access to preferred tangible item for 5 min prior to session) and a no-access condition. Low levels of problem behavior were observed following a third condition, termed the satiation condition (i.e., continuous, unlimited access to a preferred item). Studies by O'Reilly et al. and Vollmer et al. (1991) suggest that reinforcer sampling at higher magnitudes may produce a decrease in target behavior; therefore, caution may be warranted when utilizing these procedures in the context of acquisition programming for children with autism.

Parameters for the magnitude or amount of reinforcer sampling have varied in past research. One example of very brief exposure is the conspicuous visual presentation of the reinforcer while awaiting responding during session (Staats, Flinley, Minke & Wolf, 1964). Still other studies evaluated brief pre-session exposure to stimuli (10 s prior to each 10 learning trials, Park et al.) slightly longer periods of exposure (5 min, Vollmer et al.), and lengthy, continuous access to preferred stimuli (O'Reilly et al. 2009).

Taken together, the aforementioned results suggest that reinforcer sampling may establish or abolish the reinforcing value of sampled stimuli such that target responses (e.g., responding to academic tasks, engaging in problem behavior maintained by the relevant reinforcer) are more or less likely to occur during the subsequent session. One prior study (Park et al., 2008) and at least one clinical manual (Barbera & Rasmussen, 2007) related to teaching children with autism suggest that reinforcer sampling may be beneficial for increasing academic responding.

Problem behavior may decrease as a result of reinforcer sampling. Indirectly, increased academic responding resulting from reinforcer sampling may compete with problem behavior, making problem behavior less likely. A second, more direct conceptual analysis is possible. If the maintaining reinforcer for problem behavior (e.g. attention) is made available during reinforcer sampling sessions, the motivating operation for problem behavior may be decreased during subsequent sessions (O'Reilly et al. 2009). Changes in problem behavior due to a manipulation of the relevant motivating operation or as a result of response competition were not systematically evaluated by Ayllon and Azrin (1968) or Park et al. (2008).

Given mixed parameters and outcomes of reinforcer sampling found in past studies, additional research is needed on potential benefits and risks of reinforcer sampling as a method to maximize student responding during behavior-analytic teaching sessions. The current sequence of studies evaluated whether pre-session exposure to reinforcers affected the academic responding and problem behavior of children with autism. Past studies were extended in the following ways: 1) stimuli provided during reinforcer sampling sessions were identical to the stimuli earned in subsequent teaching sessions, and 2) problem behavior was measured across sessions and conditions to assess for differential changes as a function of abative effects of reinforcer sampling (Jason) or as a function of response competition (Ben and Jason).

General Method

Participants and Setting

Participants were two 10-year-old males diagnosed with autism who attended an intensive instruction program at a school for children with disabilities. Ben exhibited a variety of aberrant behaviors during teaching sessions including whining, screaming, aggressions (punching, kicking, slapping and hair pulling) and environmental destruction (throwing materials, tipping his desk). Functional analyses conducted 6 months prior to and independent of this investigation suggested that Ben's problem behavior was maintained by escape from demands. Jason exhibited a variety of aberrant behaviors during teaching sessions including aggressions (slapping, hair pulling, biting), screaming, self-injurious behavior (head hits), and leaving his seat. A functional analysis conducted 1 year prior to and independent of the current investigation suggested that Jason's problem behavior was maintained by therapist attention. Sessions took place within the participants' typical classrooms in a 1.5 meter by 1.5 meter partitioned cubby area.

Response Measurement and Interobserver Agreement

Session-by-session behaviors were scored by trained observers and summarized as percentage of trials with correct performance and problem behavior, respectively. Interobserver agreement was collected for 25% of sessions and agreement was calculated by comparing each trial and recording the total number of agreements, dividing the number of agreements by the total number of trials, and multiplying the resulting number by 100. Agreement for acquisition responding averaged 99.5 % (range, 99-100 %), agreement for maintenance responding averaged

98% (range, 96-100%), and agreement for problem behavior averaged 97.5% (range, 95-100%). Overall agreement averaged 98.3% (range, 95-100%).

General Procedures

Preference assessments. Reinforcers were identified for each participant via two (one edible, one physical attention) paired-stimulus preference assessments based on the procedures described in Fisher et al., 1992. Through consultation with the participants' primary teachers and parents, eight food items and eight forms of physical attention were evaluated. For the edible assessment, small bites of the edible were placed on a plate prior to presentation. For the physical attention assessment, photographs of the experimenter delivering each form of physical attention to the participant were presented. In a randomized order, each stimulus was paired once with every other stimulus for a total of 56 trials per assessment. Items were presented in pairs and student approach responses (defined as the participant pointing to the item) were recorded. An approach to a stimulus resulted in access to that stimulus (either consumption of the edible or 10 s of access to the depicted form of physical attention) and removal of the unchosen stimulus. To prevent exposure to reinforcing stimuli throughout the school day, study-related edible reinforcers did not include high-preference items used in the classroom for Ben. Edible preferences for Jason shifted throughout the study; therefore study-related edible reinforcers were not necessarily limited to the study. The experimenter was only involved with the participants during sessions for this study; thus, attention mediated by the experimenter was specific to the study.

Teaching procedures. The current study involved a direct comparison of acquisition and maintenance performance with and without pre-session exposure to reinforcing stimuli. Through consultation with each participant's primary therapist, the experimenter identified unmastered tasks from program areas that were historically associated with an increase in problem behavior. The experimenter taught participants to perform discrete academic tasks appropriate to their individual skill level. Both participants learned to tact pictures of previously unknown objects and activities. Ben also learned to select 5-7 letter sight words from a three stimulus array.

Across conditions, experimental sessions consisted of 15 trials of unmastered tasks (five trials each of three tasks) and 15 trials of previously mastered tasks (five trials each of three tasks). Preferred edibles (Reese's™ peanut butter cups and Chips Ahoy™ cookies for Ben; chocolate-covered pretzel and Lays™ potato chips for Jason) and social attention (high fives and back pats for Ben; head rubs and torso tickles for Jason) were delivered on a fixed- ratio (FR) 1 schedule for correct, independent responses on acquisition trials. To avoid stalled learning based on decreased motivation, edible stimuli and social praise were provided on an FR 5 schedule for correct responses on maintenance trials.

After an instruction was delivered for an acquisition or a maintenance task, participants had 5 s to respond. If the participant responded incorrectly or did not respond within 5 s, a prompt in the form of a point cue (Ben) or a full verbal model (Jason) was provided. For both acquisition and maintenance targets, prompted responses resulted in descriptive verbal feedback delivered in a neutral tone of voice (e.g., "that's number 4," "that's saying cat").

Study 1

The effects of pre-session exposure to reinforcers on academic performance and problem behavior were evaluated using an adapted alternating-treatments design. Six different academic responses (three acquisition responses and three maintenance responses) were targeted in each condition. Each participant was exposed to each condition once per day during the same morning or afternoon timeslots. The timeslot in which each condition was scheduled varied systematically across days (e.g., Monday: Exposure [AM], No-Exposure [PM]; Tuesday: No-Exposure [AM], Exposure [PM].)

Acquisition and maintenance targets were randomly assigned to each condition. The mastery criterion for each acquisition target was two consecutive sessions with 80% or greater correct responding. Participants experienced training in the assigned condition until the mastery criterion was achieved or until all targets in the comparison condition were mastered. In the latter case, unmastered targets were then taught in the more effective condition unless an ascending trend was evident in the current condition. A summary of sessions to mastery across conditions can be found in Table 1.

Exposure Condition

In the Exposure Condition, the experimenter (who is the first author) provided preferred social attention and edibles on a time-based schedule for 5 min immediately prior to each teaching session. Specifically, participants received 10 edibles (five each of top two preferred items or two edibles per 1 min) and a minimum of 50 s (10 s per 1 min) of preferred social attention. Mands for particular edibles or social interactions were acknowledged (i.e., “You are earning ____ for doing your work”) but the requested item was not delivered. After the 5-min pre-session exposure procedure concluded, the experimenter initiated a 30-trial teaching session (15 acquisition trials, 15 maintenance trials).

No-Exposure Condition

The same experimenter who conducted the Exposure Condition also ran the No-Exposure Condition. Teaching procedures were identical to the Exposure Condition except that the experimenter began the teaching session immediately without implementing the pre-session exposure procedure. To minimize the influence of experimenter presence or familiarity across conditions, he or she was present within 3 m of the child for 5 min prior to No-Exposure sessions. The experimenter did not interact with the participant during the 5-min period leading up to a No-Exposure session.

Results

Study 1 results for Ben demonstrate that pre-session exposure to reinforcing items and events produced slower acquisition than the No-Exposure condition. Results for problem behavior were undifferentiated between the Exposure and No-Exposure conditions, with a uniform drop in problem behavior from baseline to treatment. Results for maintenance responses were differentiated with mixed findings across comparisons.

In the first comparison, Ben met the mastery criterion after seven No-Exposure sessions for acquisition targets “farm” and “maple,” and after eight No-Exposure sessions for the acquisition target “heard.” Ten sessions of Exposure training were required for Ben to master the acquisition target “space,” but mastery was not met for the targets “shown” and “broom” after 12 sessions of Exposure training. Both unlearned targets were mastered in two sessions of the No-Exposure condition. In the second comparison, Ben met the mastery criterion after 6, 11, and 12 sessions of No-Exposure for the acquisition targets “color,” “mitten,” and “planet.” The mastery criterion was met following five sessions of Exposure training for the acquisition target “dragon.” The targets “errand” and “salmon” were unmastered after 12 sessions of Exposure training, thus, these targets were addressed and mastered after five sessions in the No-Exposure condition. A summary of sessions to mastery across conditions can be found in Table 1.

Accuracy of maintenance performance dropped from baseline to treatment across comparisons and conditions for Ben. Ben’s maintenance performance was better in the No-Exposure condition of the first comparison and, by contrast, his performance was better in the

Exposure condition of the second comparison. In the first comparison, maintenance performance (task of receptive identification of the printed numbers 6, 2, and 5) dropped from an average of 95% accuracy in baseline to an average of 51.6% accuracy in the Exposure condition. In the No-Exposure condition, receptive identification of the printed numbers 4, 3 and 1 dropped from an average of 88.2% accuracy to an average of 68.1% during intervention. In the second comparison, maintenance of receptive identification of printed words “day,” “man,” and “cat” dropped from an average of 96.5% accuracy in baseline to an average of 79.8% accuracy during training in the Exposure condition. In the No Exposure condition, maintenance of receptive identification of printed words “hat,” “den,” and “elf” dropped from an average of 83.5% in baseline to an average of 59.9% during training.

Problem behavior dropped from baseline to intervention for Ben. In the first comparison, the percentage of trials with problem behavior dropped from an average of 70% and 71% in the No-Exposure and Exposure condition baseline phases, respectively, to an average 17% and 12.9% during intervention. In the second comparison, the percentage of trials with problem behavior dropped from an average of 16.5% and 11.5% in the No-Exposure and Exposure condition baseline phases, respectively, to an average of 0% and 6.8%.

Study 1 results for Jason demonstrate that the Exposure condition produced slower acquisition than the No-Exposure condition, though Jason did not master a full set of responses in either condition prior to the conclusion of data collection. Tasks for Jason included expressive identification of unknown pictures (acquisition targets) and known pictures (maintenance targets). Jason met the mastery criterion for one acquisition target, “calendar,” in the No-Exposure condition after 14 sessions, but not for the other two acquisition targets (“tractor” and “eraser”). In the Exposure condition, Jason failed to meet the mastery criterion for acquisition targets “camera,” “calculator,” and “headphones” after 15 sessions.

Jason’s maintenance responding was differentiated with better performance in the No-Exposure condition. In the Exposure condition, maintenance responding for the targets “house,” “book,” and “dog” dropped from an average of 96.6% in baseline to an average of 89.7% accuracy during training. In the No-Exposure condition, correct maintenance responding for the targets “apple,” “cat,” and “chips” was stable (i.e., average of 100% accuracy in baseline; average of 99.1% in training.)

Jason acquired one expressive identification response (“calendar”) in the No-Exposure condition after 14 teaching sessions. When the mastery criterion was not attained on the remaining two targets (“tractor” and “eraser) within the No-Exposure condition or the three targets (“camera,” “calculator,” and “headphones”) taught in the Exposure condition following 15 sessions of each condition, maintenance targets were eliminated from the daily teaching sessions. This change was made to shorten the session duration and to decrease the likelihood of satiation across conditions. Maintenance responding was assessed during intermittent training sessions conducted weekly. Jason’s maintenance responding was stable subsequent to the elimination of session-by-session maintenance trials.

Similar to Ben, Jason’s results for problem behavior were undifferentiated between the Exposure and the No-Exposure conditions with a uniform drop in levels of problem behavior from baseline to treatment. Percentage of trials with problem behavior dropped from an average of 6.5% and 16.5% in the No-Exposure and Exposure condition baselines, respectively, to an average of 0.75% and 1.35%, during intervention.

Study 2

Study 2 was designed based on the failure to replicate findings from Park et al. (2008) with the magnitude of reinforcer sampling selected for Study 1. For Study 2, a Low-Exposure condition was added to Ben's third treatment comparison. O'Reilly et al. (2009) compared the effects of three different pre-session conditions on problem behavior maintained by access to tangible items. Similar to results demonstrated in the Study 1, O'Reilly et al. demonstrated that high levels of responding were observed in sessions preceded by conditions of no-access to the relevant reinforcer and low levels of responding were observed following periods of continuous access. The third condition evaluated by O'Reilly et al. entailed brief access to reinforcers and the results were similar to the No-Access condition. Thus, a Low-Exposure condition was added to the existing protocol to assess the effects of a lower magnitude of pre-session exposure. The timeslot for this condition varied systematically across days (e.g., Monday: Exposure [AM], No-Exposure [PM]; Tuesday: Low-Exposure [AM], Exposure [PM]).

The same experimenter who conducted the Exposure and No-Exposure Conditions ran the Low-Exposure condition. Teaching procedures were identical to the Exposure condition except the experimenter provided preferred social attention and edibles on a time-based schedule for 2 min rather than 5 min immediately prior to each teaching session. Specifically, participants received two edibles (two each of top two preferred items or two edibles per 1 min) and a minimum of 20 s (10 s per 1 min) of preferred social attention. Mands for particular edibles or social interactions were acknowledged (i.e., "You are earning ____ for doing your work"), but the requested item was not delivered. After the 2-min pre-session exposure procedure concluded, the experimenter initiated a 30-trial teaching session (15 acquisition trials, 15 maintenance trials).

Results

Study 2 results for Ben demonstrate that the Low-Exposure condition produced faster acquisition compared to both High-Exposure and No-Exposure conditions. Ben met the mastery criterion for the acquisition target “mouse” following three sessions in the Low-Exposure condition and he mastered the acquisition targets “North America” and “crown” following six sessions in the Low-Exposure condition. Ben met the mastery criterion following five, eight, and nine sessions, respectively, of No-Exposure sessions for the acquisition targets “shovel,” “rose,” and “Saturn.” Ben mastered “skiing” after five sessions and he mastered “basketball” and “spade” after 10 sessions. A summary of sessions to mastery across conditions in Study 2 can be found in Table 2.

In the High-Exposure condition, Ben’s maintenance responding for “flag,” “giraffe,” and “sandwich” dropped from an average of 90% during baseline to an average of 65% during training. In the Low-Exposure condition correct maintenance responding for the targets “house,” “monkey,” and “glove” dropped from an average of 83% during baseline to an average of 60% during training. In the No Exposure condition correct maintenance responding for the targets “apple,” “banana,” and “dog” dropped from an average of 87% during baseline to an average of 51% during training.

Problem behavior data were undifferentiated across conditions, with a uniform drop from baseline to intervention demonstrated in each of the three conditions. In the No-Exposure condition, the percentage of trials with problem behavior dropped from an average of 60% during baseline to an average of 17.1% during intervention. In the High-Exposure condition, the percentage of trials with problem behavior dropped from an average of 53% during baseline to an average of 23.7% during intervention. In the Low-Exposure condition the percentage of trials with problem behavior dropped from an average of 46.5% during baseline to an average of 3.33% during intervention.

Discussion

Based on data collected to date for Ben and Jason, High Exposure to reinforcer sampling did not enhance acquisition or maintenance responding and did not result in lower levels of problem behavior compared to the No-Exposure condition. Low Exposure to reinforcer sampling did enhance acquisition responding, but it did not differentially affect maintenance responding or levels of problem behavior. For Ben and Jason, levels of problem behavior dropped from baseline to training. For Jason, maintenance responding was slightly higher in the No-Exposure condition, with a decrease in responding from baseline to intervention. For Ben, maintenance responding was undifferentiated across conditions with a uniform decrease in responding from baseline to training.

Ben acquired two separate sets of receptive discrimination tasks more slowly in the Exposure condition compared to tasks presented in the No-Exposure condition. This outcome could be attributed to the abolishing effects of our sampling procedures similar to findings of Vollmer and Iwata (1991) and to the results of the continuous access condition described by O'Reilly et al. (2009). The abolishing effect was further evidenced by the rapid acquisition of unmastered Exposure targets when training began using the No-Exposure procedures across the two comparisons in Study 1.

The overall drop in maintenance responding between baseline and treatment for Ben and Jason could be attributed to an increased level of reinforcement during training as compared to baseline. During training, correct independent responses were reinforced on an FR1 schedule; therefore, as each participant made more correct responses, they each contacted more reinforcers.

This increase in reinforcement may have temporarily diminished the effects of the reinforcers within the session and slowed down responding on the maintenance tasks.

Problem behavior was undifferentiated across conditions with a uniform decrease observed from baseline to training across participants, conditions, and comparisons. Individual controlling variables for each of the participants could account for this result. Jason's problem behavior was maintained by therapist attention; therefore, the decrease in his problem behavior could be attributed to the relatively rich schedule of reinforcement (including experimenter attention) in the training phase. Edibles and experimenter attention were produced by appropriate competing responses on an FR 1 schedule across conditions. This rich schedule of experimenter attention for correct responding during the training phase may have impacted problem behavior via a temporary abative effect, making problem behavior less likely to be evoked during the training phase. Ben's problem behavior was maintained by escape from demands and escape was not granted contingent on problem behavior for the duration of this investigation. Thus, extinction may have resulted in the decrease in Ben's problem behavior. The decrease in problem behaviors demonstrated for both participants illustrate the importance of arranging individualized, function-based competing contingencies and extinction.

Results for Ben demonstrate that the Low-Exposure condition produced faster acquisition when compared to both High-Exposure and No-Exposure conditions. The Low-Exposure condition involved three fewer bites of each edible as well as 30 s less of each form of preferred social attention. In this way, lower levels of reinforcer sampling made satiation less likely. The evocative effect of relatively brief sampling involved with the Low-Exposure condition is similar to the results illustrated by Ayllon and Azrin (1968) and Park et al. (2008). This result could be the function of a temporary increase in reinforcer potency resulting from relatively brief reinforcer sampling, but not to the point of a confounding satiation effect.

Results for the Low-Exposure condition of Study 2 demonstrate the potential evocative effect that reinforcer sampling can have on academic responding while the High-Exposure results demonstrate the potential abative effect that too much reinforcer sampling can produce. This illustrates the importance of procedural integrity when employing these procedures in a clinical setting. Wolf (1978) noted that the degree to which an individual finds a treatment acceptable can affect the degree to which they will employ the procedure with integrity. Further investigation into the potential benefits and risks of pre-session exposure to reinforcers as a function of therapist and student preference as well as therapist treatment integrity with regards to these procedures, are warranted.

At least two procedural differences may account for the fact that Study 1 failed to replicate the findings of Park et al. (2008). First, the current study involved pre-session exposure to stimuli that were subsequently delivered contingent on target responses. Satiation is unlikely when pre-session stimuli are not identical to those used during teaching, such as in the procedures utilized by Park et al. (2008). Future research should further assess the evocative effects of pre-session exposure to highly preferred reinforcers that are dissimilar to reinforcers employed in teaching sessions.

One untested potential benefit of reinforcer sampling is shortened response latencies. Shorter response latencies as a function of pre-session exposure may differentially affect learning in terms of the amount of learning opportunities or trials that can be presented during the course of a session or school day. Future research should focus on assessing response latency and session time as a function of pre-session exposure in an effort to better understand the potential benefits and risks of these procedures.

Participants in the current study were both 10-year-old males diagnosed with autism. The young age of these participants made preferred social and physical attention developmentally appropriate reinforcers to assess (tickles, back pats, head rubs), though this would not necessarily be the case with an older participant. An evaluation of these procedures using forms of reinforcement more appropriate for older learners (such as tangible items, access to preferred activities, or engagement with a preferred conversation topic) would add to the literature and help in clinical decision making.

Based on research conducted to date, practitioners should exercise caution when utilizing a reinforcer sampling procedure prior to intensive teaching. The potential for a satiation effect is evidenced by results of Study 1, and decreased motivation could have detrimental effects on skill acquisition among young children with autism. Study 2 demonstrates that reinforcer sampling can result in an increase in academic skill acquisition, though these results are yet to be replicated. Additional research is warranted with regards to the amount and type of reinforcers (matched to the reinforcement used during teaching sessions, as it was in this study, or unmatched, as in Park et Al. [2008]) made available during pre-session exposure sessions.

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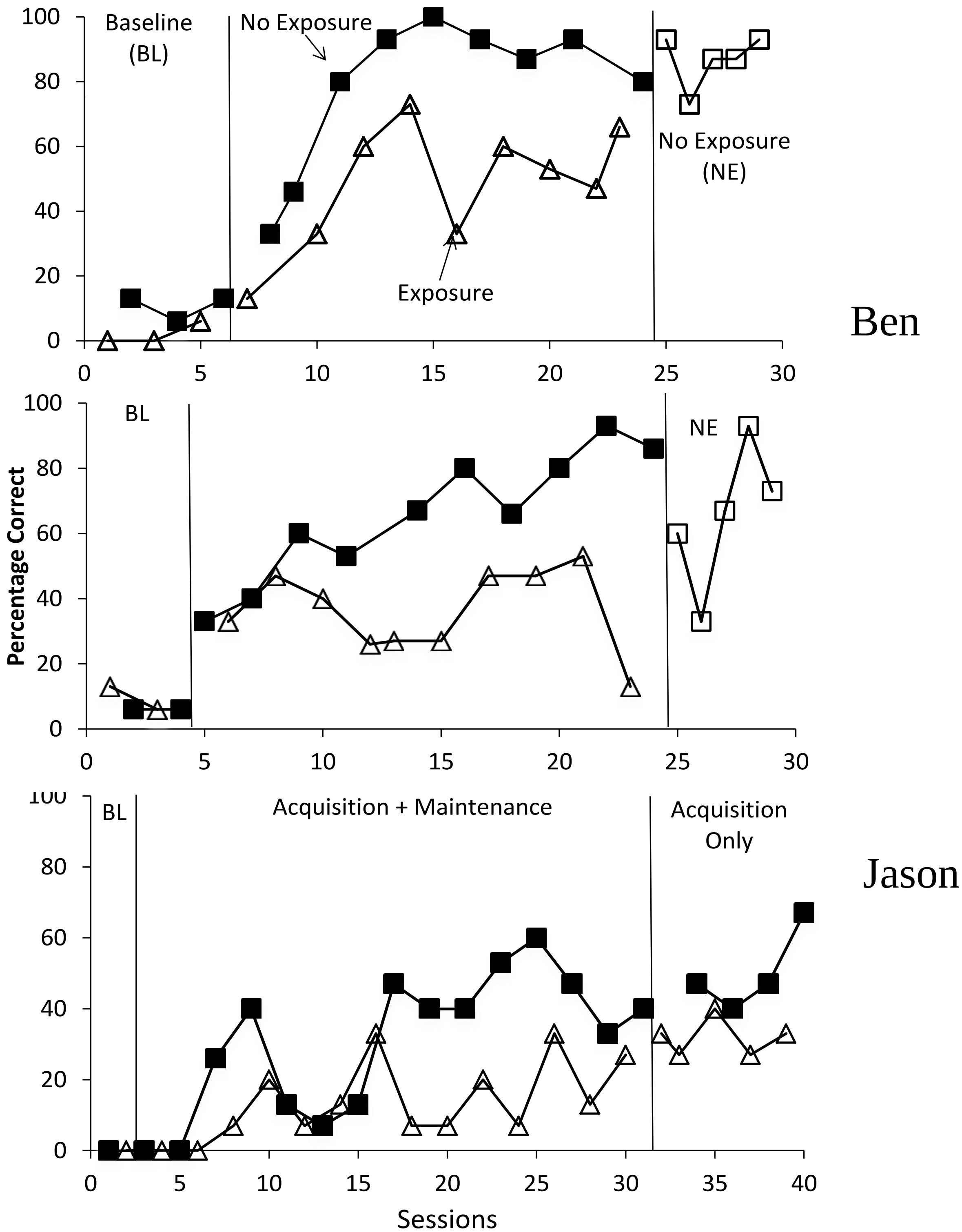

*Figure 1***:** Study 1 aggregate acquisition. The top panel illustrates Ben's performance on acquisition tasks across conditions for comparison 1. The middle panel illustrates Ben's performance on acquisition tasks across conditions for comparison 2. The bottom panel illustrates Jason's performance on acquisitions tasks across conditions.

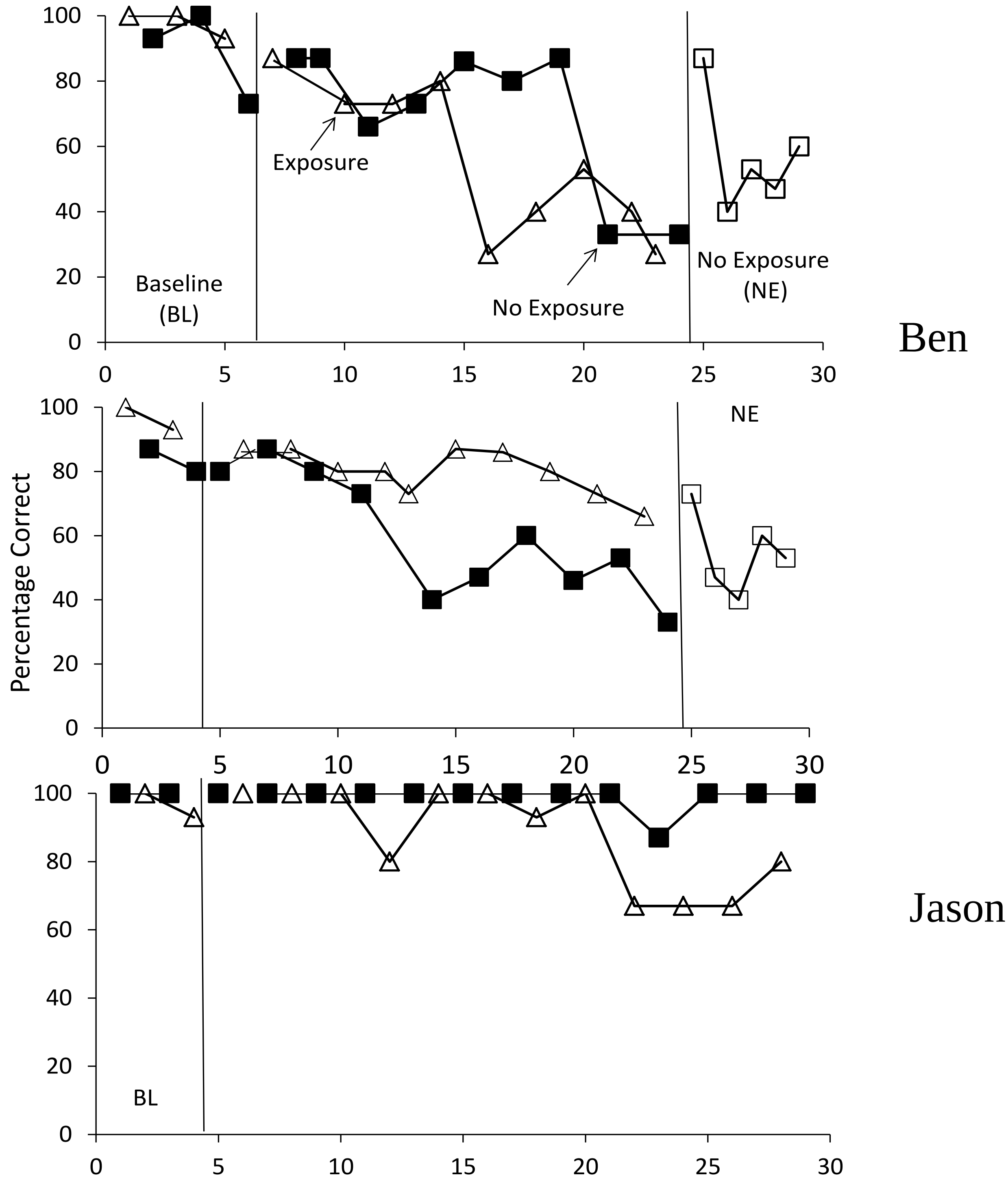

*Figure 2***:** Study 1 aggregate maintenance. The top panel illustrates Ben's performance on maintenance tasks across conditions for comparison 1. The middle panel illustrates Ben's performance on maintenance tasks across conditions for comparison 2. The bottom panel illustrates Jason's performance on maintenance tasks across conditions.

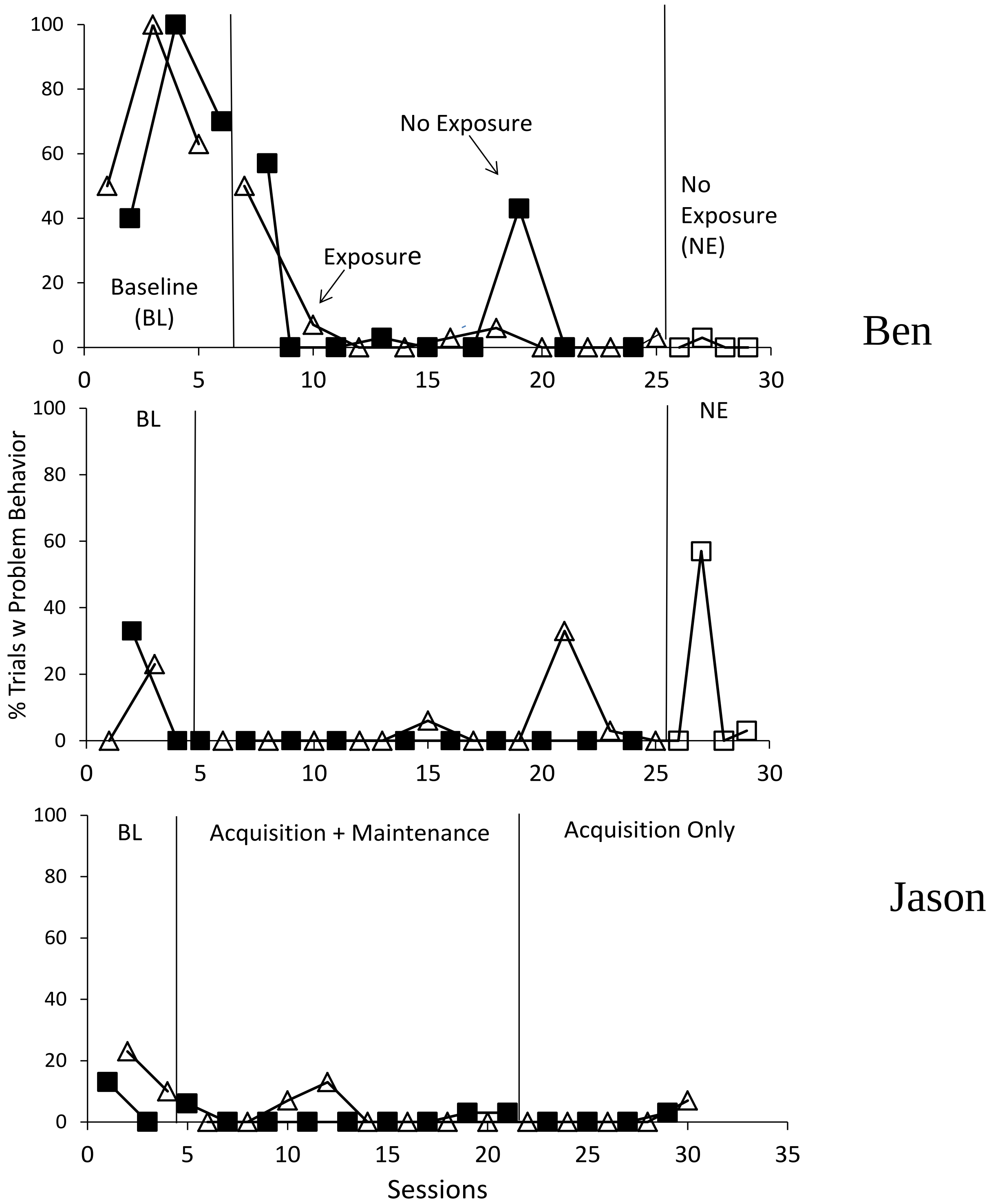

Figure 3: Study 1 aggregate problem behavior. The top panel illustrates the percentage of trials in which Ben exhibited problem behavior across conditions in comparison 1. The middle panel illustrates the percentage of trials in which Ben exhibited problem behavior across conditions in comparison 2. The bottom panel illustrates the percentage of trials in which Jason exhibited problem behavior across conditions.

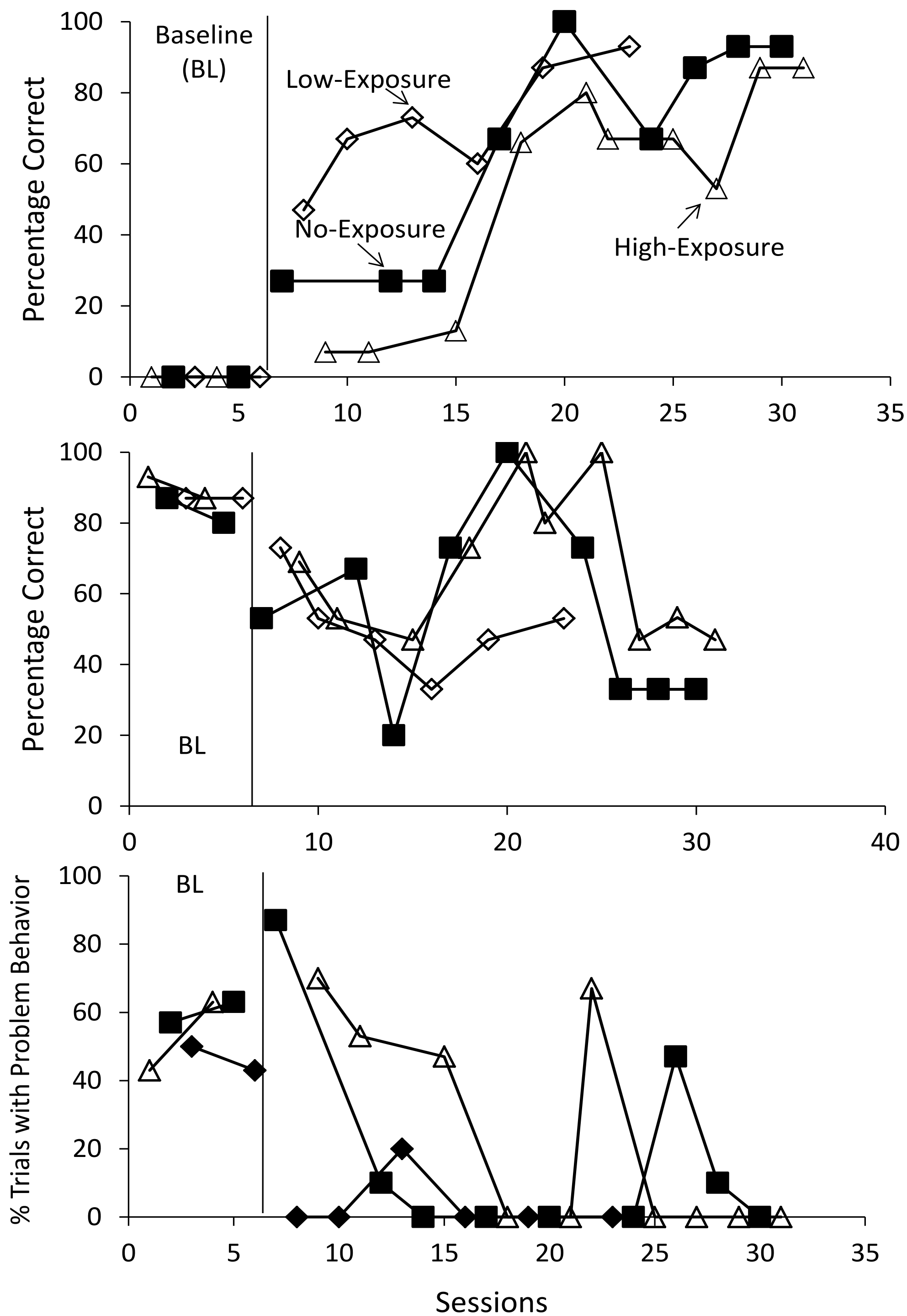

Figure 4: Study 2. The top panel illustrates Ben's performance on acquisition tasks across conditions. The middle panel illustrates Ben's performance on maintenance tasks across conditions. The bottom panel illustrates the percentage of trials in which Ben exhibited problem behavior across conditions.

Study 1	No-Exposure		Exposure	
	Farm	7	Space	10
Ben: Comparison 1	Maple	7	Shown	N/A
	Heard	8	Broom	N/A
	Color	6	Dragon	5
Ben: Comparison 2	Mitten	11	Errand	N/A
	Planet	12	Salmon	N/A
	Calendar	14	Camera	
Jason	Tractor		Calculator	
	Eraser		Headphones	

Table 1: Study 1. Number of sessions to achieve mastery criterion across participants, conditions, and comparisons.

Study 2	No-Exposure		Exposure		Low-Exposure	
	Shovel	5	Skiing	5	Mouse	3
Ben	Rose	8	Basketball	10	North America	6
	Saturn	9	Spade	10	Crown	6

Table 2: Study 2. Number of Sessions to achieve the mastery criterion across participants, conditions and comparisons