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VARIANT AND INVARIANT HIGH-PROBABILITY REQUESTS: INCREASING APPROPRIATE BEHAVIORS IN CHILDREN WITH EMOTIONAL-BEHAVIORAL DISORDERS

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This study examined the effects of variant versus invariant high-probability (high-*p*) request sequences on the performance of requests to initiate a social bid by young children with emotional-behavioral disorders. In the initial phases of the investigation, a multiple baseline design showed that the delivery of invariant sequences (i.e., high-*p* requests delivered in the same sequence) produced initial increases in compliance to requests to initiate a social bid to a peer. However, increases were not maintained across the invariant condition. The delivery of variant high-*p* sequences produced increases in compliance to requests to initiate social bids that were maintained across the variant condition. In a follow-up condition, the number of requests within the pool of the variant and invariant high-*p* requests were controlled. Results of the follow-up condition replicated those found in the initial condition. Implications for applied use and future research are discussed.

DESCRIPTORS: high-probability requests, behavioral momentum, emotional-behavioral disorders, peer intervention

High-probability (high-*p*) request sequences consist of a set of simple, easy-to-perform requests that are issued immediately prior to the delivery of a request that is usually followed by problem behavior. These sequences have been reported to be an effective intervention for reducing noncompliance with individuals of different ages who experience a range of developmental disabilities. High-*p* request sequences have been implemented successfully in a wide range of contexts that include medication acceptance, transition activities, self-care routines, social interactions, and communication routines (Davis, Brady, Hamilton, McEvoy, & Williams, 1994; Davis, Brady, Williams, & Hamilton, 1992; Harchik & Putzier, 1990; Horner, Day, Sprague, O'Brien, & Heathfield, 1991; Mace & Belfiore, 1990; Mace et al., 1988; Sanchez-Fort, Brady, & Davis, 1995; Singer, Singer, & Horner, 1987).

In addition to demonstrating the efficacy of high-*p* request sequences across a range of populations, many researchers have begun to examine variables that contribute to the procedure's effectiveness. Mace et al. (1988) conducted a series of five experiments that examined the differential effectiveness of a variety of variables including (a) the form of the low-probability (low-*p*) requests, (b) the attention given to the participant, and (c) the interprompt time (i.e., the time between the reinforcement of the last high-*p* instruction in the sequence and the delivery of the low-*p* request). Findings from these experiments were that high-*p* request sequences were more effective than a sequence of statements directed to the participant and that participants responded at a substantially higher rate with a 5-s interprompt time than they did with a 20-s interprompt time. These findings suggest that the contiguity between the high-*p* sequence and the low-*p* request is critical in building

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a momentum to respond and that the provision of noncontingent attention was not responsible for the effects attributed to the procedure.

Zarcone, Iwata, Mazaleski, and Smith (1994) investigated the effectiveness of high-*p* sequences in increasing individuals' participation in activities that, during baseline, resulted in self-injury maintained by escape. Zarcone et al. noted a decrease in compliance to high-*p* and low-*p* requests when a single set of three high-*p* requests was presented immediately prior to the delivery of a low-*p* request. They reported that across opportunities, participants began to comply substantially less often to the high-*p* requests. They hypothesized that high-*p* requests, when paired repeatedly with low-*p* requests, may come to acquire the aversive properties of low-*p* requests. Presenting a small number of different high-*p* requests may increase the discriminability of the onset of a low-*p* instruction and might serve as a discriminative stimulus for an aversive event. If this occurs, the high-*p* instructions might become part of a chain of events that function as a discriminative stimulus (S^D) for noncompliance. Moreover, Reichle (1995) found that teachers are most likely to use a small number of high-*p* instructions and to use the same sequence in delivering high-*p* instructions because it is easier to remember to implement them. Thus, additional evaluation is warranted on how to best sequence high-*p* requests.

In addition to questions regarding the procedural variations of high-*p* request sequences, there is a need to determine whether the procedure can be implemented in the milieu of ongoing daily routines in classrooms that involve peer interaction. For example, a related question is the applicability of the procedure. To date, most studies using high-*p* requests have focused on increasing compliance with individuals who have developmental disabilities. Davis et al. (1994) extended the use of high-*p* requests to influence the social interactions of young children with autism and mental retardation, but this procedure has not been used with individuals with emotional-behavioral disorders. Odom, Hoyson, Jamieson, and Strain (1985) suggested that individuals who exhibit extreme problem behaviors but are otherwise developing normally often engage in socially unacceptable patterns of interactions with their peers. Consequently, high-*p* instructional sequences may be implemented successfully by peers to increase social interactions between themselves and children diagnosed with emotional-behavioral disorders. To date, no empirical studies have addressed the implementation of high-*p* request sequences by peers, although the literature strongly supports the use of peers as change agents (Strain & Fox, 1981a, 1981b; Strain, Hoyson, & Jamieson, 1985). Those who have implemented high-*p* sequences have included group-home staff (Horner et al., 1991; Mace et al., 1988), school personnel (Davis et al., 1992; Singer et al., 1987), and parents and grandparents (Ducharme & Worling, 1994).

The primary purpose of the current investigation was to examine the effects that variant versus invariant high-*p* request sequences have on the efficacy of the high-*p* intervention. Specifically, we hypothesized that variant sequences of high-*p* requests would be associated with proportionately higher rates of compliance than invariant sequences of high-*p* requests. Second, we hypothesized that high-*p* request sequences using a variant sequence of high-*p* instructions would be effective with children who have emotional-behavioral disorders. Finally, we hypothesized that young peers could be successfully taught to implement high-*p* request sequences and achieve substantial behavior change.

METHOD

Participants and Setting

Four children, 2 boys and 2 girls, who received special education services, participated in this investigation. Peter, 5 years 6 months, and Patty, 5 years 11 months, attended a classroom for young children with severe emotional-behavioral disorders on two different regular school campuses. Peter was diagnosed with emotional-behavioral disorders and was integrated into a kindergarten classroom for the first 3 hr of the school day. Social behaviors exhibited by Peter included unwillingness to play with peers, hoarding toys, and grabbing toys from others. Patty was diagnosed with emotional-behavioral disorders, was integrated into a half-day kindergarten classroom, and exhibited behaviors such as hitting peers, kicking, and ignoring prompts to play. Rhonda, 4 years 10 months, and Keith, 4 years 8 months, were receiving special education services at two separate community day-care centers. Rhonda, who had emotional-behavioral disorders and a speech disorder, attended the day-care center for a full day. Her social behaviors included throwing toys and running from peers during social interactions. Keith attended the day-care center for a half day. Keith had been identified as having emotional-behavioral disorders and a speech disorder and exhibited social behaviors such as hitting children in close proximity and grabbing toys from others.

Each child participated in play groups that consisted of 8 to 10 children (peers) without disabilities. All play groups were held during free play and were conducted in their day-care or elementary classrooms. Peers were selected for this study on the basis of regular attendance, compliance to adult instructions, and demonstration of social competence (Odom & Strain, 1984).

For each target child, 3 children were chosen to serve as intervention peers and to deliver the high-*p* sequence. Following baseline, the intervention peers were taught to implement high-*p* sequences prior to intervention. Training procedures followed those used in previous investigations using peers as intervention agents (Davis et al., 1994; Martin, Brady, & Williams, 1991). These procedures included (a) defining the social behaviors for the peers, (b) demonstrating the delivery of the high-*p* sequence by the teacher, (c) role playing the delivery of the intervention between the peer and the teacher, (d) role playing the delivery of the high-*p* and low-*p* requests between the peer and other children in other classrooms, and (e) role playing the delivery of the intervention using prompts delivered from the investigator. To maintain procedural integrity, the investigator delivered prompts to the intervention peer to issue requests by either (a) whispering in the peer's ear while the peer was away from the target child or (b) using hand gestures while standing behind the target child and facing the intervention peer. Over the course of the study, the children were able to deliver the intervention without the use of the verbal prompts.

Other children were considered to be social peers in the play group and served as the recipients of the action associated with the low-*p* request that would be performed by the target child. For example, the intervention peer delivered the low-*p* request, "Peter [target peer], give the pizza to Sara [social peer]." Social peers were also taught to wait for the child with disabilities to initiate the interaction before responding. This was done to control for an increase in initiations from the social peers that could confound the implementation of the intervention.

Behavioral Measures

Dependent variable. The dependent variable was the percentage of compliance to low-*p* requests. Low-*p* requests were defined as those requests delivered to the target child

Table 1
Sample High-Probability and Low-Probability Requests

High	Low
Point to the soda fountain	Hand [peer] soda.
Pick up the plate.	Share the pizza with [peer].
Put some soda in the glass.	Give a donut to [peer].
Get a chocolate donut.	Share the marbles with [peer].
Pick up the marbles.	Help build the city with [peer].
Count the blocks.	Make [peer] a hamburger.
Point to the cheese.	
Pick up a bun.	
Point to the cash register.	

to initiate a social interaction with a social peer to which the target child did not typically respond. An initial pool of low-*p* requests was obtained by (a) examining the students' individual education plan; (b) asking teachers, aides, or parents; and (c) determining that nonperformance of the request was noncompliance rather than lack of ability. Ten separate opportunities were conducted by the social peers for each request to verify its low-*p* status. Requests responded to less than 50% of the time were considered low-*p* requests. For example, a low-*p* request might be to give a slice of pizza to a peer. If the target child responded to the request, social peers were prompted to respond to the social initiation. Thus, social initiations were defined as compliant responses to requests.

Responses to high-*p* requests were also measured. High-*p* requests were those within the play context that students had a history of responding to at least 80% of the time. The procedures for identifying high-*p* requests were the same as for low-*p* requests. Examples of high-*p* requests included, "Point to the soda fountain," "Pick up the plate," and "Put some soda in the glass." A sample pool of high-*p* and low-*p* requests is provided in Table 1.

*Independent variable (variant and invariant high-*p *request sequences).* Two types of high-*p* sequences, variant and invariant, were the independent variables. In an invariant sequence, three high-*p* requests were delivered consistently in the same order just prior to the delivery of a low-*p* request. Three invariant high-*p* requests were identified for each of the 4 participants. In a variant sequence, three high-*p* requests were randomly selected from a pool of approximately six high-*p* requests (range, 5 to 8) and were delivered just prior to the low-*p* request.

Collection of normative rates. A mean rate of initiations among peers was obtained and used as a guide for determining how often to implement high-*p* sequences. Normative rates of peer social initiations and teacher reinforcement were observed for 3 days during integrated play sessions. The mean rate of social initiations was once every 40 s.

Data Collection and Interobserver Agreement

Ten minutes of continuous data were collected daily using MOOSES computer-based observation system (Tapp, Wehby, & Ellis, 1995). Data derived from MOOSES permitted assessment of interactions among the target child, adults, and peers in the play setting, and included (a) responses to low-*p* and high-*p* requests, (b) correct delivery of the high-*p* and low-*p* requests, and (c) the time between the delivery of reinforcement and high-*p* and low-*p* requests (i.e., the interprompt time).

Interobserver agreement was assessed during 28%, 25%, 31%, and 30% of the ses-

sions for Rhonda, Peter, Keith, and Patty, respectively. An agreement was defined as two independent observers coding the same event within a 5-s window. If there were any differences in the coded event or if the event was coded outside of the 5-s window, an error was recorded. Agreement was calculated for responses to high-*p* requests and low-*p* requests by dividing the number of agreements by the number of agreements plus disagreements and multiplying by 100%. Data on procedural integrity of the delivery of high-*p* and low-*p* requests were collected for deliveries of the requests and for interprompt time. Mean agreements for responses to high-*p* requests were 88%, 91%, 87%, and 90% for Rhonda, Peter, Keith, and Patty, respectively. Mean agreements for responses to low-*p* requests were 95%, 98%, 98%, and 97% for Rhonda, Peter, Keith, and Patty, respectively. For procedural integrity (i.e., correct delivery and responses to low-*p* and high-*p* requests), mean agreements were 92%, 95%, 88%, and 95%, for the 4 participants.

Design and Procedural Overview

The effects of variant versus invariant high-*p* sequences on social initiations were evaluated using a combined multiple baseline and reversal (ABCBC for 2 participants and an ACBCB for the remaining 2 participants) design, in which A is baseline, B is invariant high-*p* sequences, and C is variant high-*p* sequences.

Baseline. Each play session began with a 5-min warm-up period in which the children were allowed to play together (with no data collection). During the play sessions, the intervention peer was prompted by the investigator to deliver a low-*p* request; that is, the intervention peer directed the target child to extend a social bid to a social peer. Approximately eight low-*p* requests were delivered during the 10-min play session. If the target child responded correctly to the low-*p* request, the social peer responded with a statement that would naturally extend the social interaction (e.g., "Thanks for the soda pop. Can I have a piece of pizza?"). If the target child did not respond to the low-*p* request, the intervention peer was prompted to pause approximately 30 s and then deliver another request.

High-p *intervention.* The setting and context of the play activities remained the same as in baseline. Implementation procedures for both invariant and variant high-*p* sequences were identical. During both intervention conditions, an intervention peer delivered the high-*p* sequence immediately prior to the low-*p* request. If the target child performed the high-*p* request, the intervention peer delivered a statement to continue the social interaction (consistent with those statements used in baseline). If the target child did not perform one of the high-*p* requests, the intervention peer was directed to pause for 30 s and then continue the sequence of high-*p* and low-*p* requests. After the third high-*p* request was performed, the intervention peer delivered the low-*p* request (i.e., to extend a social initiation) within 5 s. If the target child performed the low-*p* request, the interaction peer delivered praise or a social statement and the social interaction was continued by the social peer. Nonperformance of the low-*p* request resulted in a pause of approximately 30 s and the initiation of a new sequence.

Follow-Up Conditions

Participant and setting. A set of follow-up conditions for Patty was conducted 2 months after the initial study. In the original procedures, a greater number of high-*p* requests were used in the variant pool than were used in the invariant pool. For example, in Patty's original intervention, there were three requests in the invariant pool and six requests in the variant pool. To examine the singular effect that high-*p* request vari-

ability had on compliance to both high-*p* and low-*p* requests, we identified six high-*p* requests for the variant pool and six high-*p* requests for the invariant pool. Definitions for and identification of low-*p* and high-*p* requests remained the same. Thus, the invariant pool contributed two invariant sequences of three high-*p* requests. The variant high-*p* sequences were again chosen randomly from all six of the high-*p* requests in the variant pool. All requests used in the follow-up conditions were different from those used previously.

Procedural overview and data collection. An ABCBC design was used to examine the effects of invariant versus variant high-*p* sequences. Baseline and intervention procedures were the same as those implemented originally. During baseline, intervention peers delivered a low-*p* request. Intervention included the delivery of the variant or invariant sequence prior to the delivery of the low-*p* request. Variant sequences were delivered as the first condition after baseline.

Data collection and agreement were conducted as in the initial conditions. Mean agreement was 92% and 100% for responses to high-*p* requests and low-*p* requests, respectively. For procedural integrity, mean agreement was 97%.

RESULTS

Results of the high-*p* request sequences for Peter and Rhonda are presented in the top portion of Figure 1. For both children, baseline percentages of responding to low-*p* requests were variable but low, with a mean of 17.8% for Rhonda and 19.7% for Peter. When the invariant high-*p* sequences were implemented, responding to the high-*p* requests for both participants was high; however, a slight descending trend can be detected across the condition. Responding to the low-*p* requests during this initial invariant condition increased from baseline to a mean of 61.0% for Rhonda and a mean of 62.7% for Peter. However, a marked descending trend across the invariant condition occurred. During implementation of the variant condition of high-*p* sequences, responding to high-*p* requests for both children remained high and stable across the condition (M = 98.3% and 97.4% for Rhonda and Peter, respectively). Responding to low-*p* requests when the high-*p* requests were varied also remained high and stable across the condition (M = 89.6% for Rhonda and 90.8% for Peter). When invariant sequences were reintroduced, responses to the high-*p* requests decreased across the condition for both Peter and Rhonda. This condition also produced decreased responding to low-*p* requests for both participants. Rhonda's responding decreased to a mean of 41% for low-*p* requests, whereas Peter's responding to low-*p* requests decreased and was slightly variable with a mean of 32.4%. Upon reversing to variant high-*p* sequences, responding to high-*p* requests increased and remained high across the condition for both participants. Responding to low-*p* requests yielded a similar increase and trend across this final condition (M = 86.5% for Rhonda and 75.3% for Peter).

The same pattern of results occurred for Keith and Patty, even though, after baseline, they received the variant condition first, followed by the invariant condition. Results displayed in the bottom portion of Figure 1 show that during baseline, responses to low-*p* requests were variable but low for each of the children (M = 12.6% for Keith, M = 19% for Patty). When a variant condition was implemented, Keith's responses to high-*p* requests averaged 97.6%. The variant high-*p* sequences resulted in marked improvement for Keith, whose responding to low-*p* requests increased to a mean of 87.6%. When the variant high-*p* condition was implemented with Patty, responses to high-*p* requests averaged 96.6%, and re-

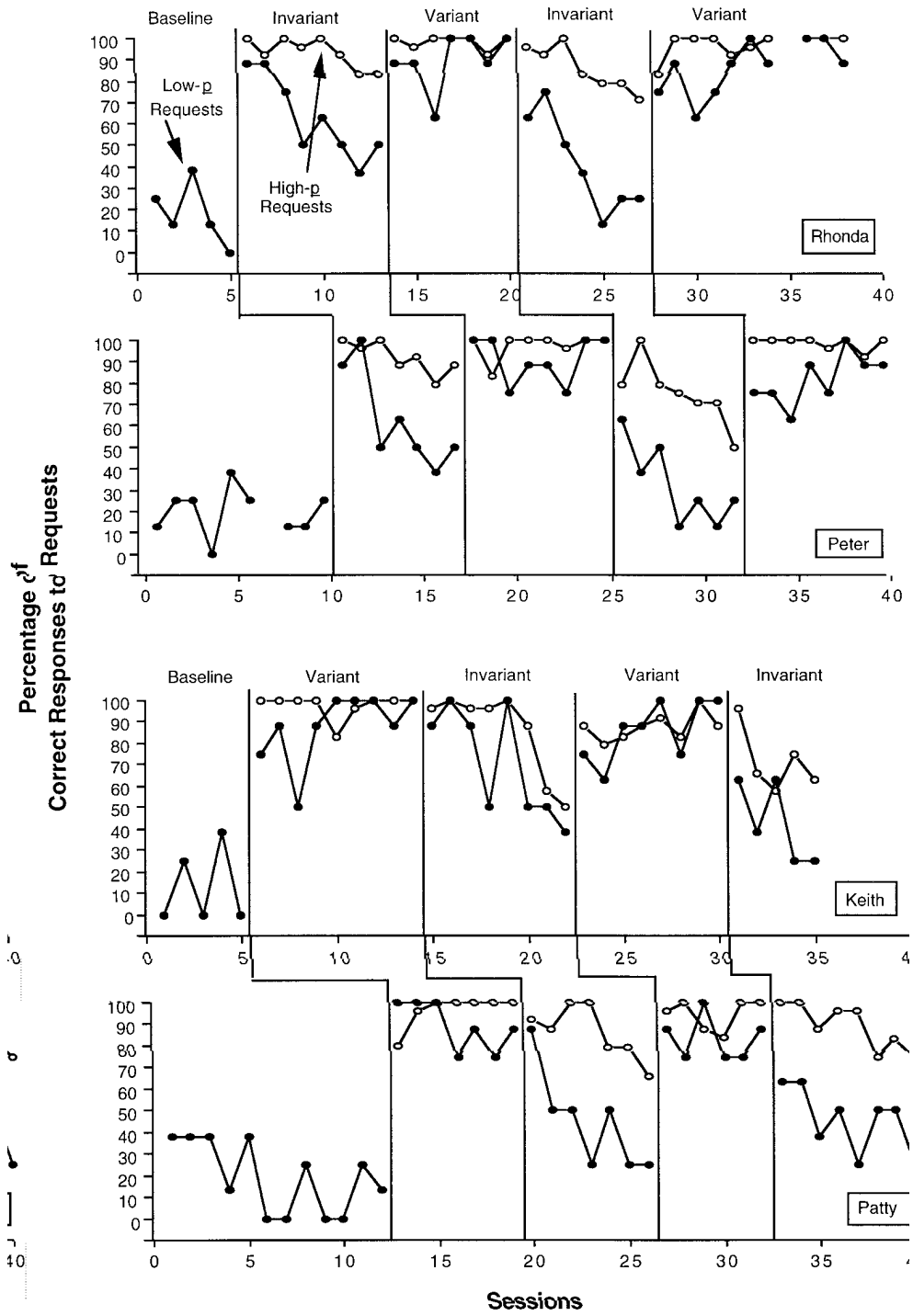

Figure 1. Percentage of correct responses to low-probability and high-probability requests during baseline and intervention with variant and invariant high-*p* sequences.

sponses to low-*p* requests increased and remained fairly stable with a mean of 89.4%. When the invariant condition was implemented, responding to high-*p* and low-*p* requests resulted in trends similar to the first 2 participants; responding was high initially but decreased across the condition. When the high-*p* request condition was reversed to the delivery of variant high-*p* requests, their responding to high-*p* requests was high and variable across the condition. Keith's responding to low-*p* requests did not increase immediately but, across the condition, resulted in an ascending trend (M = 86%). Patty's responding increased, averaging 83.5% responding to low-*p* requests. A final reversal to the invariant condition was then delivered. Keith's responding to high-*p* requests and low-*p* requests was variable across this phase and yielded a similar descending trend, as was noted in the initial invariant condition. Patty's responding to high-*p* requests averaged 84%, once again decreasing across sessions. Her responding to low-*p* requests averaged 45%.

Follow-Up

The results for follow-up conditions for Patty are displayed in Figure 2. Baseline responding to low-*p* requests averaged 22.6%. Upon implementation of the invariant high-*p* sequences, Patty's responding to low-*p* requests increased to 100% but subsequently decreased across the condition. Implementation of the variant sequences resulted in a sustained increase in responding to low-*p* requests, averaging 92.8% across the condition. When the invariant high-*p* sequences were introduced again, Patty's responding to high-*p* and low-*p* requests yielded a descending trend across the condition (high-*p* M = 54.8%, low-*p* M = 21.8%). Finally, when the variant high-*p* request sequences were reimplemented, responding to high-*p* requests once again increased. Reimplementation of the variant sequences produced higher percentages of responding to the low-*p* requests (M = 83.5%).

DISCUSSION

The results of this study demonstrate that (a) high-*p* request sequences delivered in a variant sequence are more effective than high-*p* sequences delivered in an invariant sequence, (b) high-*p* sequences are effective with children with emotional-behavioral disorders, and (c) young children can act as change agents by delivering the high-*p* sequences. In the initial procedures, the number of requests (i.e., variant and invariant) in each of the high-*p* request pools was not controlled. Consequently, the larger number of requests in the variant pool might have contributed to the maintenance of high percentages of compliance to high-*p* request sequences rather than the order in which they were delivered. This potential limitation was addressed in the follow-up conditions implemented with Patty, with the results replicating the original results.

Three explanations may account for these findings. First, as suggested by Zarcone et al. (1994), it is plausible that invariant high-*p* sequences may make the high-*p* requests more discriminable as part of a chain of events that predictably precedes a discriminative stimulus to engage in an avoidance response (i.e., noncompliance). That is, the invariant high-*p* sequence may become part of the S^D for noncompliance, thus reducing compliant responses to both low-*p* requests and high-*p* requests. In this investigation, no contingencies were in place for noncompliance to low-*p* requests. Thus, similar to Zarcone et al.'s finding, the invariant high-*p* sequence may become an S^D for reinforced escape behavior (i.e., negative reinforcement). Second, high-*p* sequences could function as a chained schedule. The initial high-*p* request in the sequence of three could function as an S^D for the next high-*p* request that

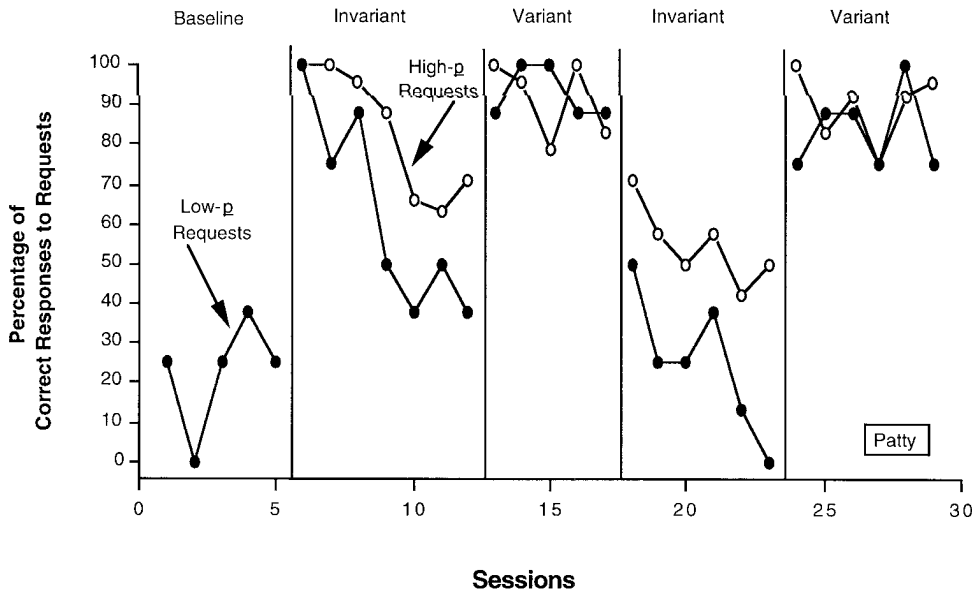

Figure 2. Percentage of correct responses to low-probability and high-probability requests during baseline and intervention with variant and invariant high-*p* sequences for follow-up procedures.

would then lead to the successful completion of low-*p* request (i.e., terminal link). When the invariant high-*p* sequence is delivered prior to the low-*p* request (which has historically functioned as an S^{Δ} [a stimulus in the presence of which a given response is not likely to be reinforced] for compliance), then the invariant sequence may change from being an S^{D} for compliance to an S^{Δ} for compliance. From this perspective, each of the high-*p* requests has become chained to predict nonreinforcement to the low-*p* request. Third, repeated presentation of high-*p* requests may result in satiation to reinforcers associated with engagement in high-*p* requests. If this occurs, the probability of compliance to high-*p* requests diminishes. Diminishing compliance to high-*p* request sequences would interfere with the attempt to build a momentum of positive responding (i.e., increase response rate). With a decrement in responding to high-*p* requests, the participant's compliance to low-*p* requests would not be altered as a result of the attempted intervention.

Anecdotal reports indicated that at least 3 participants engaged in avoidance responses to high-*p* requests by the end of the invariant sequence conditions. These avoidance responses were characterized by the participant moving away from the child delivering the high-*p* requests, throwing materials, or verbalizing negative responses (e.g., "no" and "go away"). These observations suggest that the invariant sequences began to take on the aversive qualities that had been previously associated with the low-*p* request, thus supporting the hypothesis that the invariant high-*p* requests may have become more discriminable (predicted the delivery of the low-*p* request). Based on these anecdotal observations, we conducted an analysis that attempted to identify a pattern of responding, or lack thereof, to the high-*p* requests during the invariant conditions. However, this analysis did not yield a pattern of responding.

Future investigations might more clearly determine whether the mechanism accounting for problems associated with invariant sequences is attributable to aspects of positive reinforcement associated with high-*p* re-

quests or to negative reinforcement associated with low-*p* requests. For example, implementing alternating sequences of variant and invariant high-*p* request sequences prior to their association with low-*p* requests would provide a clearer examination of the role that satiation might play in rendering an invariant high-*p* request sequence ineffective. If low-*p* requests have an impact on compliance to high-*p* requests, one would hypothesize that when sequences of high-*p* requests were presented without the following low-*p* requests, there would be little decrement in performance of high-*p* requests regardless of their sequencing (variant or invariant). On the other hand, satiation with the positive reinforcer associated with high-*p* requests would account for greater decrement in performance to invariant high-*p* requests in the absence of low-*p* instructions.

Mace et al. (1988) have attributed the success of the high-*p* sequence to a phenomenon called *behavioral momentum.* This phenomenon relies on increasing (a) the response rate, which is a function of the response–reinforcer contingency, and (b) the resistance of that response rate to change, which is a function of the stimulus–reinforcer contingency (Nevin, Tota, Torquato, & Shull, 1990). If a child, for whatever reason, does not respond to requests that have, in the past, had a high probability of being performed, then these relationships are nonexistent. Specifically, if we hypothesize that the invariant high-*p* sequences function as an S^{Δ} for compliance, the stimulus–reinforcer contingency is weakened because fewer reinforcers are delivered in the presence of the stimuli. In addition, the response–reinforcer relationship is weakened due to the decrease in response-contingent reinforcement. Thus, compliance loses momentum and correct responses to low-*p* requests decrease.

The findings of the current investigation have extended the literature by showing (a) the utility of teaching inexperienced peers to use high-*p* request sequences, and (b) the effectiveness of this intervention with children who are diagnosed with emotional-behavioral disorders. Although peers have been used to implement a variety of interventions, this study expands the empirically validated peer-mediated interventions to include high-*p* requests. However, due to the extensive teacher training and prompting used in this study, it is necessary to replicate the use of this strategy by peers to determine the efficiency of high-*p* requests as a peer-mediated strategy from the teacher's perspective (Strain & Fox, 1981a, 1981b). Second, this investigation replicated our previous study that expanded the utility of high-*p* requests beyond simple compliance to influence social interactions of young children with severe disabilities. The current investigation extends our previous findings in demonstrating the use of high-*p* requests as a social interaction strategy to a population other than those who experience cognitive delays. Future investigations should continue to examine the utility of high-*p* sequences with a wide variety of populations.

In summary, these results suggest that the configuration of high-*p* request sequences significantly influenced the effectiveness of the intervention strategy. This outcome suggests that the sequencing of high-*p* requests represents a critical component in designing an efficient protocol for the delivery of high-*p* requests. However, it is unclear whether the cause of this phenomenon is related to enhanced satiation as a function of invariant sequencing or whether the characteristics of the low-*p* instruction interact with characteristics of an invariant sequence. If the latter is the case, the relative strength of the reinforcing qualities associated with high-*p* instructions and low-*p* instructions may represent an important consideration for investigators. The implications of this study support the use of the high-*p* intervention by peers in a classroom setting to increase re-

sponding to requests. In addition, this study indicates that high-*p* request sequences may be effective with individuals who are diagnosed with emotional-behavioral disorders but are otherwise developing normally.

REFERENCES

Davis, C., Brady, M., Hamilton, R., McEvoy, M., & Williams, R. (1994). Effects of high-probability requests on the social interactions of young children with severe disabilities. *Journal of Applied Behavior Analysis, 27,* 619–637.

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

Ducharme, J., & Worling, D. (1994). Behavioral momentum and stimulus fading in the acquisition and maintenance of child compliance in the home. *Journal of Applied Behavior Analysis, 27,* 639–647.

Harchik, A., & Putzier, V. (1990). The use of high-probability requests to increase compliance with instructions to take medication. *Journal of the Association for Persons with Severe Handicaps, 15,* 40–43.

Horner, R., Day, M., Sprague, J., O'Brien, M., & Heathfield, L. (1991). Interspersed requests: A nonaversive procedure for reducing aggression and self-injury during instruction. *Journal of Applied Behavior Analysis, 24,* 265–278.

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

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

Martin, S., Brady, M., & Williams, S. (1991). Effects of toys on the social behavior of preschool children in integrated and nonintegrated groups: Investigation of a setting event. *Journal of Early Intervention, 15,* 153–161.

Nevin, J., Tota, M., Torquato, R., & Shull, R. (1990). Alternative reinforcement increases resistance to change: Pavlovian or operant contingencies? *Journal of the Experimental Analysis of Behavior, 53,* 359–379.

Odom, S. L., Hoyson, M., Jamieson, B., & Strain, P. S. (1985). Increasing handicapped preschoolers' peer social interactions: Cross setting and component analysis. *Journal of Applied Behavior Analysis, 18,* 3–16.

Odom, S. L., & Strain, P. S. (1984). Peer mediated approaches to increasing children's social interactions. *American Journal of Orthopsychiatry, 54,* 544–557.

Reichle, J. (1995). *A survey of strategies that preschool teachers would use to implement high-probability request sequences*. Unpublished manuscript, University of Minnesota, Minneapolis.

Sanchez-Fort, M., Brady, M. P., & Davis, C. A. (1995). Using high-probability requests to increase low-probability communication behavior in young children with severe disabilities. *Education and Training in Mental Retardation and Developmental Disabilities, 30,* 151–165.

Singer, G., Singer, J., & Horner, R. (1987). Using pretask requests to increase the probability of compliance for students with severe disabilities. *Journal of the Association for Persons with Severe Handicaps, 12,* 287–291.

Strain, P., & Fox, J. (1981a). Peer social initiations and the modification of social withdrawal: A review and future perspective. *Journal of Pediatric Psychology, 6,* 417–433.

Strain, P., & Fox, J. (1981b). Peers as behavior change agents for socially withdrawn classmates. In B. Lahey & A. Kazdin (Eds.), *Advances in child clinical psychology* (pp. 167–198). New York: Plenum Press.

Strain, P., Hoyson, M., & Jamieson, B. (1985). Normally developing preschoolers as intervention agents for autistic-like children. *Journal of the Division for Early Childhood, 9,* 105–115.

Tapp, J. T., Wehby, J. H., & Ellis, D. N. (1995). A multiple option observation system for experimental studies: MOOSES. *Behavior Research Methods, Instruments, & Computers, 27(1),* 25–31.

Zarcone, J., Iwata, B., Mazaleski, J., & Smith, R. (1994). Momentum and extinction effects on self-injurious escape behavior and noncompliance. *Journal of Applied Behavior Analysis, 27,* 649–658.

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STUDY QUESTIONS

1. Briefly describe a high-probability request sequence and how it has been shown to affect compliance.

2. What were the three purposes of the study?

3. The authors' primary dependent variable was compliance with requests (low- and high-*p*). What additional data would have been helpful in evaluating the general effects of the high-*p* sequences?

4. How were high- and low-*p* requests identified and operationally defined?

5. In what way did the invariant and variant high-*p* sequences differ?

6. Briefly describe the experimental conditions of the study and the design used to evaluate the effects of the high-*p* sequences. Also, what modification was included in Patty's follow-up conditions, and what potential source of confounding effects did this modification address?

7. What were the general results of the study in terms of compliance with both high- and low-*p* requests?

8. What explanations did the authors provide to account for their findings? Are there any others? Which explanation(s) do you favor?

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