

AN EVALUATION AND COMPARISON OF TIME-OUT PROCEDURES
WITH AND WITHOUT RELEASE CONTINGENCIES

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A common recommendation for implementing time-out procedures is to include a release contingency such that the individual is not allowed to leave time-out until no problem behavior has occurred for a specific amount of time (e.g., 30 s). We compared a fixed-duration time-out procedure to a release contingency time-out procedure with 4 young children (3- and 4-year-olds) using a reversal and multielement design. Results demonstrated that both time-out procedures were effective at reducing problem behavior outside time-out, problem behavior occurred in time-out during both procedures, and problem behavior in time-out was not predictive of problem behavior outside time-out.

Key words: time-out, release contingencies, preschool, problem behavior

Time-out is typically structurally defined as a procedure that involves removing an individual from the reinforcing environment to an austere environment to decrease the future probability of problematic behavior. Time-out commonly is used in schools and homes and has proven to be effective across various topographies of behavior and in many different settings (see Brantner & Doherty, 1983, for a review). MacDonough and Forehand (1973) described eight time-out parameters, one of which was the inclusion of a release contingency. Release contingencies require that the individual remains in time-out until no problem behavior has occurred for a specific amount of time. There are two general release contingency procedures: (a) resetting the time-out duration such that the individual must engage in no problem behavior for an entire time-out interval (e.g., if the time-out interval is 5 min, the individual must remain in time-out until 5 min elapse with no problem behavior) or (b)

requiring that no problem behavior occurs for a specified amount of time at the end of the time-out interval (e.g., if the time-out interval is 5 min, the individual may be required to engage in no problem behavior during the final 30 s of time-out or time-out is extended until 30 s elapse with no problem behavior). Release contingencies have been suggested as a means to reduce the likelihood that problem behavior in time-out will be reinforced adventitiously by release from time-out (Mace, Page, Ivancic, & O'Brien, 1986). Release contingencies also may decrease the risk posed by problem behavior that both persists during time-out and continues after time-out (e.g., severe aggression).

Many studies that have evaluated time-out procedures have incorporated a release contingency in the procedure (e.g., Bean & Roberts, 1981; Bostow & Bailey, 1969; Clark, Rowbury, Baer, & Baer, 1973; Iwata, Rolider, & Dozier, 2009), but only a few studies specifically have evaluated release contingencies relative to the effectiveness of time-out in general and to reductions in problem behavior during time-out in particular (Erford, 1999; Hobbs & Forehand, 1975; Mace et al., 1986). The Hobbs and Forehand and Erford studies both found release contingency time-out to be more effective than fixed-duration time-out. Unfortunately, the generality of these results is limited somewhat

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because both studies reported the results only as statistical tests and mean values within groups (no individual participant data were reported). Other technological or methodological limitations (e.g., all of the data in the Erford study were collected by the parents, and no interobserver agreement data were reported) preclude drawing robust conclusions about the efficacy of time-out with and without release contingencies.

Despite a lack of conclusive findings about the use of a release contingency, some authors of nonempirical articles that offer clinical advice (e.g., Reitman & Drabman, 1996) and authors of commonly used textbooks (e.g., Cooper, Heron, & Heward, 2007; Miltenberger, 2007) recommend using release contingency time-out. Cooper et al. state, "Under no conditions should time-out be terminated if any inappropriate behavior is occurring" (2007, p. 362). If problem behavior in time-out is predictive of problem behavior outside time-out, a release contingency should be recommended; however, if a release contingency is used without necessity, individuals may spend inappropriately long periods of time in time-out. Given the mixed findings and limitations of the previous literature, further research that evaluates the effects of including a release contingency in time-out procedures is warranted to provide empirical evidence for clinical recommendations.

Two single-subject studies provided individual participant data on the effectiveness of release contingencies. Mace et al. (1986) and Luiselli, Pace, and Dunn (2006) found the use of a release contingency to be no more effective than time-out (Mace et al.) or restraint (Luiselli et al.) without a release contingency, and the release contingency resulted in time-outs or restraints that were longer than necessary. Mace et al. compared the effects of release contingency and fixed-duration time-out procedures on the problem behavior of three participants with developmental disabilities using an ABAC reversal and a multiple baseline across settings design. They found that both time-out procedures were

effective at reducing or eliminating problem behavior, neither procedure reduced problem behavior in time-out, and the release contingency time-out resulted in longer time-outs. Several potential limitations of the Mace study are worth mentioning. First, the baseline consisted of providing attention contingent on problem behavior. Simply withholding attention may have substantially reduced problem behavior such that time-out was unnecessary. A second potential limitation of the Mace study was a floor effect; time-out eliminated nearly all problem behavior, making comparisons between the two time-out procedures limited.

Luiselli et al. (2006) compared the effectiveness of release contingency and fixed-duration restraint procedures on the number of restraints required for three individuals with developmental disabilities. The authors concluded that the release contingency restraint was more effective at reducing the number of restraints necessary and also resulted in less overall time spent in restraints. However, no baseline data were collected, and the restraint procedures were implemented consecutively in an AB design, with the fixed-duration restraint procedure occurring as the second intervention for two participants. For one of these participants, no differences were apparent across the two procedures. For the other participant, a decreasing trend occurred throughout both procedures, making the results inconclusive. An ABAB reversal design was used for the third participant, in which A was release contingency restraint and B was fixed-duration restraint. No differences were observed between the procedures. Conclusions based on the Luiselli et al. study must be tentative due to these limitations, especially because of the apparent lack of experimental control.

The purpose of the current study was to compare a release contingency time-out to a fixed-duration time-out to determine whether or not preschool-age children should remain in time-out until problem behavior stops. Attention

was withheld following problem behavior to ensure that simply withholding attention would not reduce problem behavior and to demonstrate that time-out from more than just adult attention was necessary to reduce problem behavior.

METHOD

Participants and Setting

Four children who had been referred to the study by their teachers or parents for the treatment of problem behavior in the classroom, on the playground, or in their home participated in this study. Harold was a 4-year-old boy who had been diagnosed with autism. He had no recognizable vocal verbal repertoire. Adam was a typically developing 4-year-old boy in a general education preschool classroom. Jackson was a 4-year-old boy labeled by the school as having a developmental delay. Forrest was a 3-year-old boy who had been diagnosed with autism; he made a few vocal word approximations but communicated mostly through signs.

Sessions took place in the location where problem behavior occurred most frequently, as reported by the teachers and parents. Harold's problem behavior occurred throughout the day, but his sessions took place in his home during free play. Harold could move freely about the house and had access to preferred movies and games (puzzles). Adam's sessions took place on the playground at his preschool. The playground had large equipment with slides and tunnels, soccer balls, a playhouse, and bikes on a circular track. The entire playground was mulched. Jackson's sessions took place in his classroom during circle time. Circle time was teacher directed and typically consisted of singing songs, reading books, and having students show the class items from home. Forrest's sessions took place both at school and at home. Forrest's school sessions took place during recess, which occurred in one of three places, depending on the weather: (a) on a

playground on sand with large equipment with slides and tunnels; (b) in an outdoor concrete play area with a sand box, playhouse, and bikes; or (c) in a large open area between classrooms with many toys, including a dollhouse with miniature furniture and dolls, cars, trains, and xylophones. Forrest's home sessions were similar to Harold's in that free access to all toys, games, and movies was available.

Response Measurement and Interobserver Agreement

All responses were selected based on teacher or parent report that the responses were problematic, and previous attempts to reduce responding were unsuccessful. *Time-out-producing responses* were those that resulted in the therapist implementing a time-out contingent on the behavior. For all participants, the most problematic responses, according to their teachers and parents, were selected as time-out-producing responses. At first glance, the time-out-producing responses may appear to be relatively mild. However, in all cases, the responses were selected because such behavior previously had resulted in serious injury to other children in these or similar schools (e.g., throwing sand, jumping from swings) or significantly disrupted classroom learning opportunities for all students (e.g., screaming, throwing academic materials). Also noteworthy is that in all cases teachers and administrators deemed these forms of behavior to be target responses that should produce time-out. It is important, further, to note that the type of time-out used here is different from time-out used for severe clinical behavior disorders insofar as no seclusionary or isolation time-out was used; rather, the student merely was separated from the play activity. This type of time-out is structurally similar to the type of time-out used in virtually every preschool and early elementary school we have observed. Thus, the behavior-to-consequence match was viewed as socially valid by parents and school personnel. *Delay-producing responses* were any problematic responses during time-out; in the release

contingency time-out condition, delay-producing responses resulted in an extension of the time-out interval. In some cases, the delay-producing responses were actually more severe than the time-out-producing responses (e.g., aggression). This occurred in situations when the more severe behavior rarely was observed outside time-out but seemed to be a side effect of time-out.

Harold's time-out-producing problem behavior was *screaming*, which was defined as any vocalization above conversational level. Harold's screaming was loud and disruptive at home and occurred nearly constantly. Crying, aggression, and disruption also were recorded outside time-out but did not produce time-out. *Crying* was defined as visible tears or frowning of the brow and pouting. *Aggression* was defined as hitting, kicking, biting, or spitting on another person. *Disruption* was defined as kicking or banging on walls and pulling on the time-out rug or the colored card used as a discriminative stimulus (described below). Crying, aggression, and disruption were defined the same way for the other participants, unless otherwise specified. Harold's delay-producing responses were screaming, crying, aggression, and disruption.

Adam's time-out-producing problem behavior was breaking any of the standard playground rules (which would typically be categorized as disruption) or continuing to do something when told to stop. Some examples of the playground rules included only slide down slides feet first, no jumping off the swing, sand must stay in the sandbox, soccer balls must be kicked only in a designated area, and no pushing other children (a more comprehensive list of playground rules is available from the authors). Adam's teacher created all of the playground rules and she reported that time-out was a typical consequence for breaking any of the rules; however, throughout the study, she only occasionally sent other students to time-out for breaking a rule. Crying was recorded outside time-out but did not produce time-out. Adam's delay-producing problematic responses were

crying, aggression, disruption, talking, and escape. *Disruption* was defined as standing on the time-out bench, touching mulch, or pulling on the colored card used as a discriminative stimulus. *Talking* was defined as any vocal noise, with the exclusion of coughing, sneezing, and crying. *Escape* was defined as having no body part touching the time-out bench after time-out had started.

Jackson's time-out-producing behavior was *disruption* during circle time, which was defined as getting out of his seat or lying down across chairs, touching other students, playing with toys or books, and rocking his chair back. Crying and aggression also were recorded outside time-out but did not produce time-out. Jackson's delay-producing responses were crying, aggression, disruption, and talking. Talking was defined in the same way as for Adam.

Forrest's time-out-producing behavior was throwing or swiping (off a table) objects and sand, which was defined as releasing an object from his hand from more than 15 cm above the ground or other surface. For example, Forrest sometimes spun and threw a metal tin full of plastic letters. Crying, aggression, and disruption were recorded outside time-out but did not produce time-out. Forrest's delay-producing responses were crying, aggression, and disruption.

Data collectors used handheld computers with direct observation software (Instant Data) to record frequencies of each type of problem behavior. If a response occurred continuously (e.g., Adam continuously dug in the mulch), a response was scored only once (when the response began). A new talking response was scored each time the participant paused and began vocalizing again. Rate measures were obtained by dividing the total number of responses by the session time (in minutes). Crying was recorded as a duration measure and converted to a percentage of the session by dividing the number of seconds of crying by the total number of seconds in the session and multiplying by 100%.

A second observer collected data during 47%, 53%, 49%, and 39% of time-out evaluation

sessions for Harold, Adam, Jackson, and Forrest, respectively. Interobserver agreement was calculated by dividing each session into consecutive 10-s intervals, scoring each interval as an agreement if both observers recorded the same number of occurrences or the nonoccurrence of a response, and dividing the number of agreements by the total number of intervals. Mean agreements were 97%, 96%, 98%, and 97% for time-out evaluation sessions for Harold, Adam, Jackson, and Forrest, respectively.

Procedure

The relative effectiveness of the time-out procedures was evaluated using an ABAB reversal design. The two time-out procedures were compared during the B phases in a multielement design. If more than one session was conducted in a day, the two types of time-out sessions were alternated. The first session of each day was the opposite from the first session of the previous day (e.g., if a release contingency session was conducted first on Tuesday, a fixed-duration session was conducted first on Wednesday).

Sessions were either 10 min (Harold, Adam, and Forrest) or the duration of circle time (Jackson), which averaged 13.7 min. Time-out time was subtracted from session time so that participants had 10 min (or an average of 11.6 min for Jackson) of time-in from which the rate of problem behavior was calculated. During time-in, a variety of potentially reinforcing stimuli were continuously available (i.e., access to movies, snacks, puzzles, etc. for Harold and Forrest at home; access to playground equipment, attention from peers, and physical exercise for Adam and Forrest on the playground; and teacher attention and access to songs and books for Jackson during circle time). Prior to each time-out session, participants were shown a colored card (0.4 m by 0.25 m) that was associated with that session's contingency (yellow for fixed duration, red for release contingency), and then the card was displayed where it could be seen easily throughout the session and from the time-out area. The

therapist provided Adam and Jackson with verbal instructions that stated the contingency prior to the start of each session to enhance the saliency of the difference between the contingencies. The therapist did not provide the verbal instructions to Harold and Forrest because of their limited verbal repertoires (both receptive and expressive) and histories of poor compliance with instructions.

The general time-out procedure for both time-out conditions involved the delivery of a verbal prompt that stated the problem behavior and instructed the participant to go to time-out; physical guidance of the participant to time-out, if necessary; blocking escape from time-out, if necessary; and stating "time's up" and moving away from the time-out area when the timer beeped, signaling that the time-out interval was complete. The timer was visible to all participants while in time-out, although none of them appeared to look at it. Physical guidance to time-out was never required for Jackson, but Harold, Adam, and Forrest sometimes required it. Physical guidance involved an open hand on the participant's back and gently providing pressure to prompt walking while pointing to the time-out area. No verbal attention was provided during time-out, but physical attention in the form of blocking escape was provided, if necessary. The time-out locations were either on a bench (Adam) or in a carpeted corner with no chair. The experimenter stood in front of the bench or in front of the opening to the corner. To block escape, the experimenter held both arms out with open palms and moved his or her entire body in front of the participant. The time-out interval began when the participant entered the time-out area.

Baseline. The regularly scheduled activity occurred (free play or circle time), and no programmed consequences were delivered. That is, teachers and experimenters interacted with the children if the children initiated interaction. Problem behavior typically produced no social consequences. In a few instances, dangerous

behavior produced blocking (e.g., Adam jumped from the top of the playground equipment and climbed up to do it again, so an experimenter stood in front of the ledge so that he could no longer jump). Parents and teachers were instructed not to provide attention following instances of problem behavior. No explicit demands were delivered; however, students were expected to stay in the playground area and follow the rules on the playground or stay in circle time and participate in songs and interactive activities. Activities in which low levels of demands are delivered were selected to reduce the likelihood that problem behavior would be evoked by instructions (cf. Solnick, Rincover, & Peterson, 1977).

Fixed-duration time-out. Prior to the start of each session, the therapist showed the yellow card to the participant. In addition, the therapist told Adam and Jackson, "If you are sent to time-out, you only have to stay for 4 min, no matter what." The yellow card then was placed prominently in the session area. Time-out was delivered contingent on every instance of problem behavior and resulted in a fixed-duration 4-min time-out (Hobbs, Forehand, & Murray, 1978).

Release contingency time-out. Prior to the start of each session, the therapist showed the red card to the participant. The therapist told Adam and Jackson, "If you are sent to time-out, you will have to stay for 4 min, but you cannot leave time-out until you are calm." The red card then was placed prominently in the session area. A 4-min time-out was delivered contingent on every instance of problem behavior. If a delay-producing response occurred during the last 30 s of time-out, the time-out interval was extended until 30 s elapsed without the occurrence of delay-producing responses or until 10 min elapsed. No stimulus was presented to signal that the time-out interval was being extended.

RESULTS

Figure 1 shows the rate of time-out-producing problem behavior across sessions for each

participant. Both time-out procedures effectively reduced problem behavior for all participants and in both settings for Forrest. Problem behavior reemerged during the return to baseline condition for all participants. Harold's return to baseline resulted in higher levels of problem behavior than in the previous baseline, Adam's return to baseline resulted in levels that were approximately the same as the initial baseline, and Jackson's and Forrest's return to baseline produced lower levels of problem behavior than observed in the initial baseline, but still higher than in time-out conditions. When time-out was reintroduced, the problem behavior of all participants decreased. Figure 2 shows the rate of delay-producing problem behavior that occurred in time-out during both phases for each participant. Crying is not included in the figures for Harold, Adam, and Jackson because it rarely occurred. Crying is the only delay-producing behavior that is shown for Forrest because it was the only response that occurred consistently, and there was no observable difference between time-out conditions for other delay-producing problem behavior. During the first time-out phase, Harold engaged in delay-producing behavior during time-out at a variable but approximately equal level in both conditions. During the second time-out phase, Harold engaged in delay-producing behavior in both conditions but at a consistently higher rate in the fixed-duration condition. The most common delay-producing response for Harold was screaming. Adam engaged in delay-producing behavior within similar ranges in both conditions and in both phases. The most common delay-producing behavior for Adam was disruption. There was no apparent difference in delay-producing behavior between the conditions. Because time-out was so effective at decreasing Jackson's inappropriate behavior, there are very few data points in both phases to be compared; however, there was no apparent difference between the conditions. The most common delay-producing behavior for Jackson was talking.

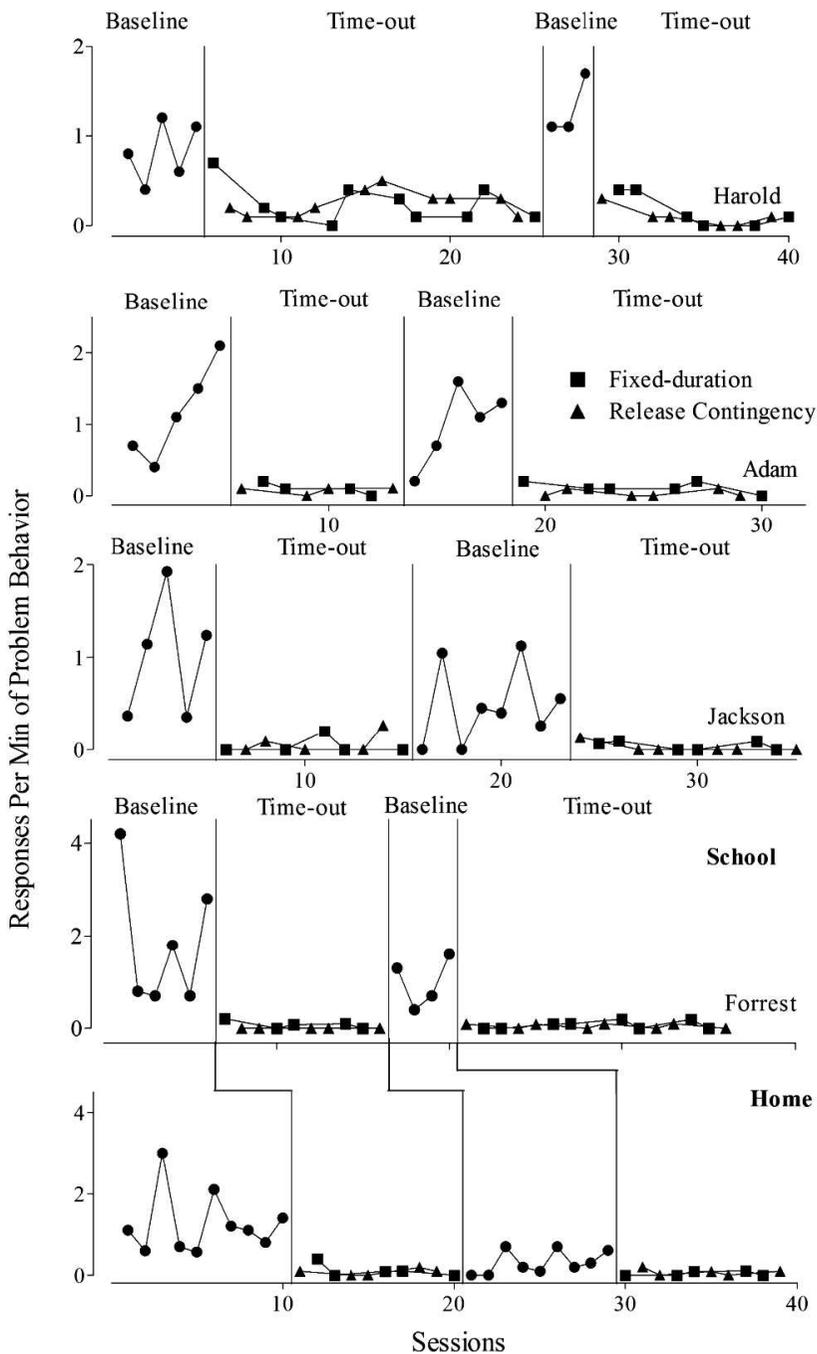


Figure 1. Rate (in responses per minute) of time-out-producing problem behavior across sessions for each participant. The data in the top panel for Forrest were collected at school, and the data in the bottom panel for Forrest were collected at his home.

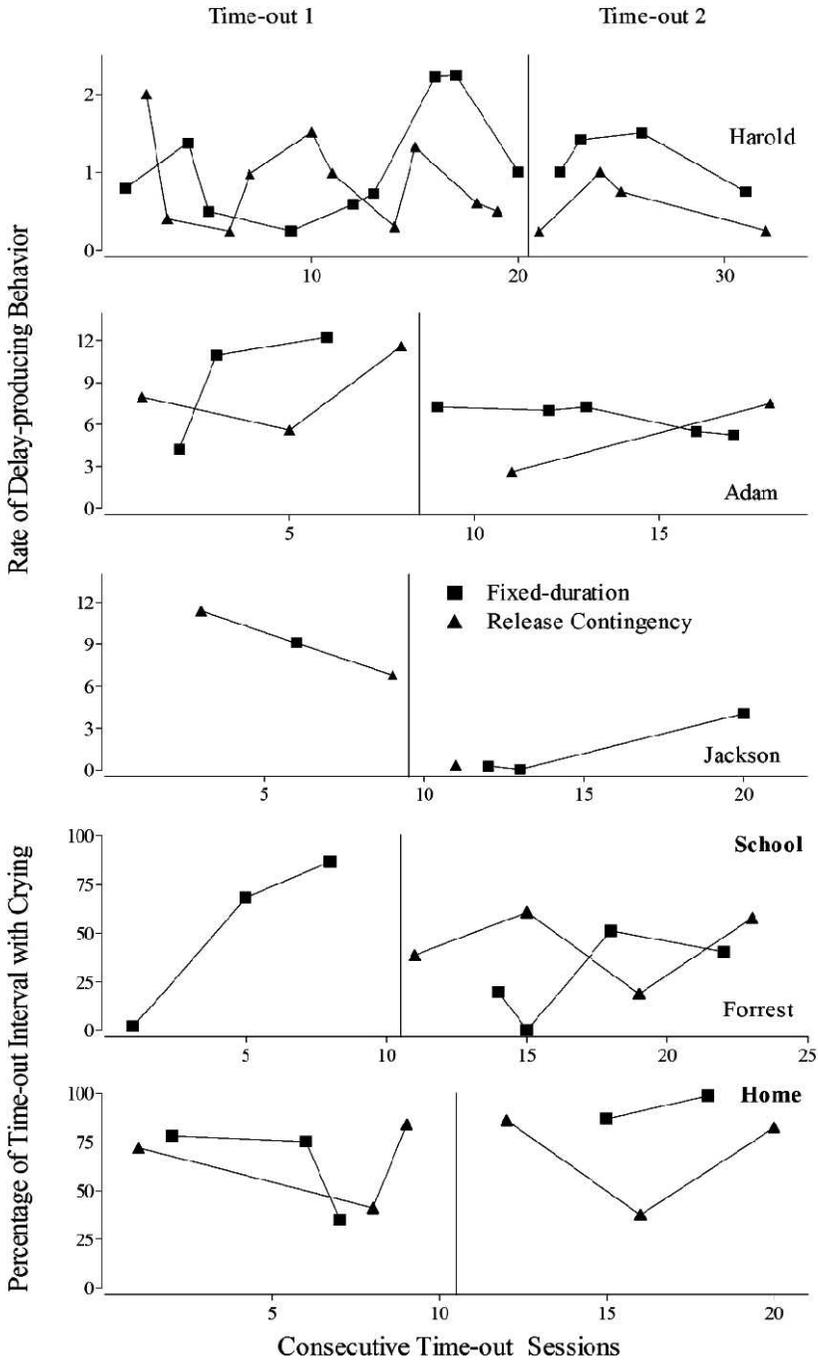


Figure 2. The top three panels show the rate (in responses per minute) of delay-producing problem behavior for Harold, Adam, and Jackson. The bottom two panels show the percentage of the session in which crying occurred for Forrest at school and at home. Consecutive time-out sessions are shown along the x axis in each panel. Problem behavior during the fixed-duration time-out sessions are denoted by squares, and release contingency time-out sessions are denoted by triangles.

Forrest did not go to time-out at all in the release contingency condition during the first phase of time-out at school, so no comparison between the conditions can be made during that phase. During the second time-out phase at school, Forrest cried at approximately equal levels in both conditions. At home, he cried in both conditions during both time-out phases; he cried equally in both conditions during the first phase and more during the fixed-duration time-out condition in the second phase.

Figure 3 shows cumulative records of all problem behavior (both time-out-producing and delay-producing behavior) for one fixed-duration time-out session for each participant and one for each setting for Forrest. We selected representative sample records after ensuring that problem behavior occurred during the final 30 s of time-out. These graphs show within-session patterns of problem behavior both in session and in time-out. If problem behavior at the end of the time-out interval was likely to persist following release from time-out, steps up in the graph should be observed immediately after time-out. Also, the probability of problem behavior immediately following time-out should be higher when problem behavior occurred at the end of the time-out interval. These graphs provide examples of instances when problem behavior occurred in time-out and within the last 30 s of time-out but did not persist after release from time-out and are representative of sessions in which the time-out-producing problem behavior occurred. Problem behavior occurred during the last 30 s (of the first 4 min) of time-out 42% of time-out implementations for Harold, 87% for Adam, 50% for Jackson, 57% for Forrest at school, and 94% for Forrest at home. No temporal patterns of delay-producing behavior in time-out were observed; delay-producing behavior was not more likely to occur at the beginning or end of time-out. We also calculated conditional and background probabilities of problem behavior that occurred within the first minute after release from time-out (Vollmer, Borrero, Wright, Van Camp, & Lalli,

2001). The conditional probability was defined as the probability that problem behavior occurred within the first minute after release from time-out given that problem behavior occurred during the last 30 s of time-out. The background probability is the probability that problem behavior occurred within the first minute after release from time-out regardless of whether or not problem behavior occurred in the last 30 s of time-out. Both the conditional and background probabilities were zero for Adam, Jackson, and Forrest. They never engaged in problem behavior within the first minute after being released from time-out. Harold was the only participant who engaged in problem behavior within the first minute after being released from time-out, but did so only rarely (conditional probability = .18, background probability = .37).

Average time-out duration was considerably longer in the release contingency time-out condition for most of the participants. The fixed-duration time-out necessarily averaged 4 min, and the contingent release time-out averaged 4.45 min, 9.85 min, 8 min, 5 min, and 8 min for Harold, Adam, Jackson, Forrest at school, and Forrest at home, respectively.

DISCUSSION

Both the fixed-duration time-out and release contingency time-out were effective at reducing the problem behavior of all participants (and in two settings for one participant). All participants engaged in problem behavior in time-out in both conditions. Harold and Forrest, at home, engaged in less problem behavior in time-out when a release contingency was in place during the second time-out phase. However, the release contingency did not eliminate the occurrence of problem behavior. All other participants engaged in problem behavior at approximately the same level in both time-out conditions. Thus, the release contingency did not eliminate problem behavior in time-out for any participants, and reduced problem behavior in time-out for only two participants (and in only one setting for

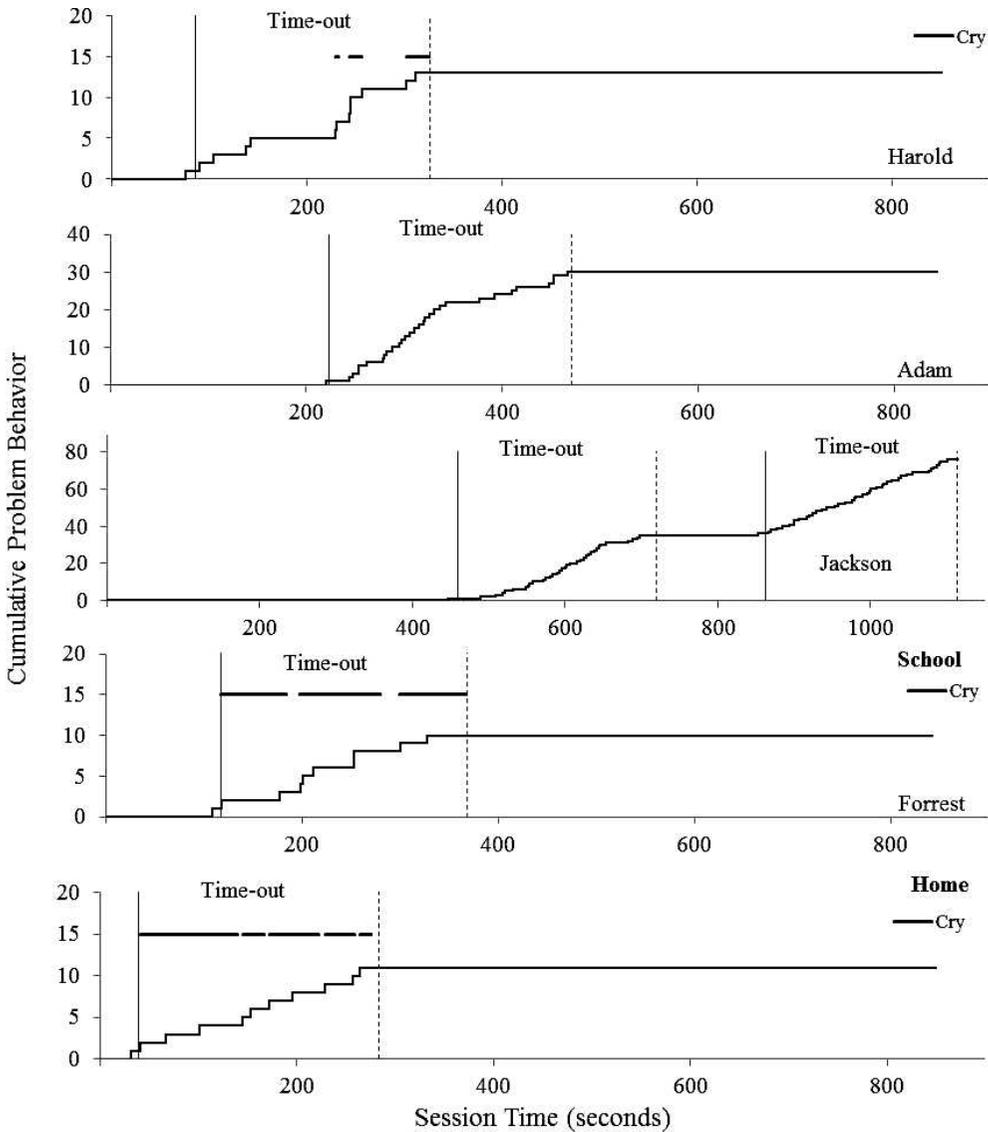


Figure 3. One fixed-duration time-out session is shown for each participant (Sessions 37, 23, and 11 for Harold, Adam, and Jackson, respectively), and one session for each location for Forrest (Sessions 14 and 34 at school and home, respectively) to show the relation between problem behavior in time-out and problem behavior after time-out. Cumulative time-out- and delay-producing problem behavior is shown across session time (in seconds). Crying was recorded as a duration measure, and a dark horizontal line above the cumulative record indicates the occurrence of crying. Vertical solid lines mark the start of time-out, and dashed vertical lines mark the end of time-out.

Forrest) during one phase. In addition, problem behavior in time-out was not predictive of problem behavior outside time-out. For all but one participant, problem behavior never occurred within the first minute of being released from time-out. One participant did engage in

problem behavior in the first minute after being released from time-out, but only very rarely and even less so when problem behavior occurred during the last 30 s of time-out. The notion that children should not be released from time-out if problem behavior is occurring in time-

out because the problem behavior will persist outside time-out was not supported by these data. In addition, the results do not support the idea that problem behavior in time-out is likely to be adventitiously reinforced by release from time-out. The findings of this study generally replicated the findings of Mace et al. (1986).

The results of this study and the Mace et al. (1986) study are not surprising when problem behavior in time-out is conceptualized as *superstitious*, as suggested by calling release from time-out following problem behavior *adventitious reinforcement*. Skinner (1948) described superstitious behavior as emerging when reinforcement was presented on a time-based schedule. Superstitious behavior is more likely to emerge when the intervals between reinforcer deliveries are short, such that the probability of reinforcement following superstitious behavior is greater than the probability of no reinforcement following superstitious behavior. The way time-out procedures typically are arranged (particularly if time-out durations are long) makes superstitious behavior unlikely. Problem behavior in time-out is less likely to result in reinforcement (release from time-out) than to result in no reinforcement (staying in time-out). Also, the use of a timer during a fixed-duration time-out makes the contingency more explicit and reduces the likelihood of any development of superstitious behavior. An alternative explanation to why problem behavior occurs in time-out is that some problem behavior in time-out (e.g., crying) is elicited by aversive stimulation. Future research is needed to determine the causes of problem behavior in time-out and develop ways to reduce problem behavior in time-out. Although problem behavior in time-out was not predictive of problem behavior outside time-out, problem behavior in time-out makes time-out implementation aversive for caregivers and teachers and, if severe enough, can possibly rule out time-out as a potential treatment. During the release contingency

time-out condition, the only programmed contingency for problem behavior occurred during the last 30 s of the time-out interval. A more effective way to decrease problem behavior throughout time-out may be to signal that time is being added to the time-out interval after each instance of inappropriate behavior.

Also, future research should evaluate the conditions under which side effects do and do not occur during time-out procedures. Problem behavior in time-out may not occur with all individuals. Determining the conditions under which problem behavior does not occur in time-out could lead to developing procedures outside time-out that make problem behavior in time-out less likely. For example, a reduction of the time-out interval contingent on appropriate behavior rather than an increase of the time-out interval contingent on inappropriate behavior may function more clearly as differential reinforcement of appropriate behavior. Parents, teachers, and practitioners may be more likely to implement time-out procedures with good treatment integrity if time-out does not produce problem behavior in time-out.

Some limitations of the study warrant mentioning. First, the participants had limited contact with contingencies due to the effectiveness of time-out and, for Harold, problem behavior in time-out extended time-out only briefly, making the time-out durations nearly equal and the contingencies potentially indiscriminable. Second, the multielement design may have produced carryover effects, thus limiting the external validity of the findings. It is possible that the contingencies in one condition affected behavior in both conditions despite the use of discriminative stimuli (i.e., the colored cards were used to signal the condition for all participants, and pre-session instructions were used for two participants). Finally, the 10-min limit on time-out sometimes resulted in a fixed-duration 10-min time-out during the release contingency time-out condition (i.e., some participants engaged in problem

behavior continuously in time-out and never met the 30-s criterion to be released). However, no participant stayed in time-out for 10 min for all time-outs in the release contingency condition. Staying the full 10 min never occurred for Harold and Forrest at school, occurred twice for Jackson, three times for Adam, and five times for Forrest at home.

Although a release contingency was not beneficial for the participants in this study, there may be instances when a release contingency should be used. Future research should evaluate the use of release contingencies for children who engage in problem behavior in time-out and immediately after time-out. None of the participants in this study engaged in problem behavior immediately after time-out. However, some individuals may continue to engage in problem behavior immediately after time-out if they are engaging in problem behavior when the time-out duration ends. Problem behavior did occur at the end of the time-out interval during the fixed-duration time-out condition for all participants (examples of which are shown in Figure 3), so the overall likelihood of problem behavior immediately after a fixed-duration time-out, although unknown, may be fairly low. However, one circumstance in which problem behavior after time-out may be more likely is if a child engaged in severe aggression prior to time-out and there is concern that the child would engage in severe aggression toward the same individual after being released. However, no data suggest that a release contingency would prevent aggression after release from time-out. In a situation such as this, time-out may not be an appropriate treatment option.

Time-out can be an effective way to reduce problem behavior in young children and should be considered when selecting a treatment for problem behavior in schools and homes. A fixed-duration time-out should be considered first because there was no apparent benefit to including a release contingency, release contingencies

resulted in longer time-outs, and the effort required to implement a release contingency time-out is greater than that required to implement a fixed-duration time-out.

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