

EVALUATIONS OF TIME-OUT PARAMETERS WITH YOUNG CHILDREN

By

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Time-out (TO) is a procedure that involves restricting access to reinforcers (e.g., Baer, 1962; Wolf, Risley, & Mees, 1964). Although the effectiveness of TO procedures has been widely demonstrated, many TO parameters, as described by MacDonough and Forehand (1973) have not been adequately evaluated (e.g., application, release contingency, schedule). The current series of TO studies was designed to evaluate some important TO parameters that affect ease of TO implementation. Application refers to whether TO follows a verbal instruction to go to TO or whether children require physical guidance to TO (Study 1). Release contingency refers to whether a child must be calm during TO prior to being allowed to leave the TO area (Study 2). Schedule refers to whether TO is implemented following every instance of problem behavior or intermittently (Study 3).

TO was an effective procedure to reduce the problem behavior of all subjects in all studies and should be recommended for young children with problem behavior during enriched time-in activities. The reduced TO interval contingency (Study 1) should be recommended for children who do not go to TO on their own. Release contingencies of the kind used in Study 2 should not be recommended, as the release contingency procedure we evaluated had no effect on problem behavior in TO. Warnings to TO did not increase the effectiveness of intermittent TO,

but also did not function as a reinforcer for problem, so should not necessarily be recommended, but should not be recommended against if parents and teachers find that warnings have an immediate interruptive effect.

CHAPTER 1 GENERAL INTRODUCTION

Time-out (TO) is a procedure that involves restricting access to reinforcers (Baer, 1962; Wolf, Risley, & Mees, 1964). In behavior analysis, the procedure is used as a form of punishment to reduce problematic behavior by making TO contingent upon problematic behavior. TO is commonly used with young children and has proven to be effective across various topographies of behavior and in many different settings (Brantner & Doherty, 1983). Many teachers of young children (i.e., pre-school and early elementary teachers) use TO in their classrooms, and parents of young children implement TO procedures at home. Zabel (1986) conducted a survey of 730 teachers of behaviorally disordered students and found that 88% of pre-school teachers and 78% of elementary school teachers working with children between the ages of five and eight years old, who responded, reported using TO in their classrooms.

There are two general types of TO: TO in which the individual remains in the room in which problem behavior occurred but is placed away from all potential reinforcers (nonexclusion, contingent observation) and TO in which the individual is placed in a separate room from where problem behavior was occurring (exclusion, seclusion, isolation). Both general types of TO have been demonstrated to be effective at reducing problem behavior (e.g., Porterfield, Herbert-Jackson, & Risley, 1976; Clark, Rowbury, Baer, & Baer, 1973), but TO in which the individual remains in the same room where problem behavior was occurring may be more feasible for parents and teachers and less susceptible to abuse. Parents and teachers may not have an appropriate room devoid of all potential reinforcers to which a child could go safely alone, and even if they do, monitoring the child in TO may be more difficult. Contingent observation specifically refers to TO in which individuals in TO can observe other individuals accessing reinforcement in time-in (Porterfield et al., 1976). Because contingent observation TOs

have been shown to be effective, practical, and safe (Fleece, O'Brien, & Drabman, 1981; Mace & Heller, 1990; Porterfield et al.; White & Bailey, 1990), that form of TO will be used in the present studies.

MacDonough and Forehand (1973) described eight TO parameters: verbalized reason, warning, administration (instructional or physical), location, duration, TO stimulus, schedule, and release. Much of the previous research evaluating TO demonstrated that TO can be effective, but did not focus on examining how to arrange these specific TO parameters to make TO most effective and easiest to implement. Because TO is so widely used (and misused) by parents and teachers and is known to be an effective treatment for problem behavior exhibited by young children, evaluations of specific TO parameters and procedures to make TO implementation less effortful are warranted. Additionally, TO is one of the few punishment procedures that is still considered socially acceptable, as suggested by recommendations for TO in popular parenting television shows (e.g., *Super Nanny*) and in the many commercially available TO chairs for children. Also, previous studies have shown that both parents and teachers find TO to be an acceptable procedure for children with behavior problems (Hobbs, Walle, & Caldwell, 1984; Zabel, 1986). In comparison to reinforcement-based procedures, relatively little is known about punishment procedures in applied behavior analysis, and further research in the area of punishment is necessary to obtain a more complete understanding of behavioral processes (Lerman & Vorndran, 2002).

Duration of TO is one parameter that has been evaluated in several studies (Benjamin, Mazzarins, & Kupfersmid, 1983; Burchard & Barrera, 1972; Hobbs, Forehand, & Murray, 1978; James, 1976; Kendall, Nay, & Jeffers, 1975; McGuffin, 1991; Pendergrass, 1971; White, Nielson, & Johnson, 1972). The general findings have concluded that either all durations of TO

were approximately equally effective (Benjamin et al., 1983; James, 1976; Pendergrass, 1971) or all durations of TO except the shortest duration of TO (which was either 10 s or 1 min) were consistently effective (Hobbs et al., 1978; McGuffin, 1991; White et al., 1972). As a result of these findings, brief TOs (3 or 4 min) were selected as the standard TO durations in the current studies.

The application, release, schedule, and warnings parameters seem most closely related to the effort required to implement TO procedures. These parameters were selected for evaluation to begin to determine the most efficient way to implement TO. The purpose of Study 1 was to evaluate a contingency for decreasing the TO interval given compliance with the verbal instruction to go to TO. Study 2 examined the use of release contingencies to determine if children need to remain in TO until calm. Finally, Study 3 assessed both schedule and warning parameters to evaluate whether intermittent TO can be effective and whether warnings enhance the effectiveness of intermittent TO.

CHAPTER 2 GENERAL METHOD

Subjects, Setting, and Response Definitions

Subjects were referred to the studies by their teachers because they exhibited problem behavior at school or parents reported to the teachers that problem behavior occurred at home. Sessions were conducted in the location where problem behavior most frequently occurred, as reported by the teachers and parents, with the caveat that the time-in environment had putative reinforcing properties (e.g., attention from adults, access to various toys). Pierce and Risley (1974) demonstrated that access to recreation time could function as a reinforcer for entire groups of students in a community center. Therefore, if problem behavior occurred during recess or free play time, sessions were conducted at that time to try to maximize the stimulus change between time-in and TO. Additionally, the time-in environments were arranged such that escape-maintained problem behavior was unlikely to occur by placing few, if any, demands and providing noncontingent access to many possible reinforcers. Responses for each subject were defined individually and are described below.

Response Measurement and Interobserver Agreement

The rate of problem behavior (in responses per min) during time-in was a dependent variable in all studies. Additional dependent variables are specified for each study below, if relevant. Data were collected using handheld devices (*hp* iPAQ®) with a behavioral recording program that allows frequency and duration data to be collected for multiple responses in real time (Instant Data). Rate measures were obtained by dividing the total number of responses by the session time (in min). Duration measures were converted to percentages by dividing the total duration of the response by the session time and multiplying by 100.

Interobserver agreement (IOA) was collected by having a second observer simultaneously but independently collect data on at least 20% of sessions for each subject in all studies. Proportional agreement IOA was calculated by dividing each session into consecutive 10-s intervals, dividing the smaller number of responses by the larger number of responses in each interval to get a proportion, adding all proportions, and dividing by the total number of intervals. When both observers scored zero occurrences, the interval was considered a 100% agreement.

General Procedure

Throughout all phases of the studies, parents and teachers present during the sessions were asked to allow the experimenters to handle all problem behavior and, specifically, to ignore any problem behavior from the subjects. During baselines, no TO was implemented. Following baselines, an experimenter implemented TO contingent on problem behavior. All TO locations were a small area within the larger time-in area (e.g., a carpeted corner of the classroom or a carpet square at the edge of the playground), designed as a contingent observation procedure (Porterfield et al., 1976). During all TO procedures, an experimenter informed the subject of the problem behavior and instructed the subject to go to TO (e.g., “No throwing. Go to TO”). A timer was then set, and the TO interval began once the subject was in the TO area. While in TO, no verbal attention was provided to the subjects; physical attention in the form of blocking escape was provided when necessary. To block escape, the experimenter held both arms out with open palms and moved his or her entire body in front of the subject. When the TO duration elapsed, the experimenter implementing TO said, “Time is up” and moved away from the TO area.

Unless otherwise specified, all sessions were either 10 min or the duration of the scheduled activity in which problem behavior typically occurred (e.g., circle time), and TO time

was subtracted from the session time (e.g., if circle time lasted 15 min and the subject spent 8 min in TO, the session time would be 7 min).

CHAPTER 3
STUDY 1: EVALUATING THE EFFECTS OF A REDUCE TIME-OUT INTERVAL
CONTINGENT ON COMPLIANCE WITH THE TIME-OUT DEMAND

Probably because of the aversive nature of TO, children do not always go to the TO location when asked. Only two studies, to date, have evaluated procedures to increase compliance with TO (Twyman, Johnson, Buie, & Nelson, 1994; Warzak & Floress, 2009). Twyman et al. evaluated the effects of delivering warnings that a more severe form of TO (longer, exclusion) would be implemented if subjects did not comply with the demand to go to a contingent observation TO. In one condition, subjects received warnings for refusing to go to contingent observation TO. If the subject did not go to contingent observation TO, he or she was sent to exclusion TO. In the other condition, if the subject refused to go to contingent observation TO, he or she was sent immediately to exclusion TO (no warnings were delivered). Subjects were more likely to comply with the contingent observation TO demand when no warnings were given. However, one limitation of the Twyman et al. study was that data were not reported on the responses that resulted in TO, only the number of times TO was implemented and whether or not subjects complied with TO. The contingent observation TO may not have been effective whether subjects complied with it or not. Burchard and Barrera (1972) implemented a similar procedure for noncompliance with the TO demand in which subjects were fined points in an ongoing token system and sent to 30-min isolation TO (instead of a 5-min or 30-min TO on a bench behind a partition) contingent on refusal to go to TO or disruption during TO. However, they did not evaluate the effectiveness of the procedure on compliance with TO. Only data on the frequency of TOs were reported.

Warzak and Floress (2009) evaluated a deferred TO procedure with 2 young boys, in which the caregiver refused to give the subjects attention or tangibles until they served TO, but the subjects could still access reinforcers in his or her environment that were not controlled by

the caregiver. There were several limitations of the study that make conclusions about the effectiveness of the deferred TO procedure tentative, including weak experimental control, failure to report changes in TO-producing behavior (only latency to go to TO was reported), and failure to report IOA measures when data were collected by caregivers. Although a deferred TO procedure could be effective when children must ask caregivers for reinforcers (e.g., when toys are out of reach), other procedures may need to be considered in settings in which children can control their own reinforcers (e.g., on the playground).

The purpose of Study 1 is to evaluate a TO procedure designed to decrease problem behavior and increase compliance with the TO demand by reducing the TO interval contingent on compliance. To address some of the limitations of previous studies, data were collected both on the latency to comply with the TO demand and on the rate of TO-producing problem behavior. Additionally, the procedure evaluated in this study can be used in a wide variety of settings, including settings in which the child can access reinforcers freely.

Method

Subjects

Six subjects were referred to the study by their pre-school or kindergarten teachers because they exhibited problem behavior during free play times. No subjects were excluded. Gary was 3 years old; Austin, Adam, and Brandon were 4 years old; Stevie and Ricky were 5 years old. Stevie was diagnosed with ADHD, and Brandon was diagnosed with Emotional Disorder. Gary, Austin, Ricky, and Adam had no diagnoses.

Sessions took place on the playground (Stevie, Austin, Ricky, and Adam) or in the home during free play time (Gary and Brandon). The playground settings were large, enclosed areas with equipment on which to climb, swings, sand boxes, and toys. TO was located along a wall in the playground area. TO on the playground was a chair TO because all subjects had a history of

being sent to TO in a chair. Brandon and Gary's sessions took place in the bedrooms of their houses, where they had free access to many toys and games. There was a carpeted corner set up as a TO space in Brandon and Gary's bedrooms. No toys or other objects were within arm's reach of the TO area.

Response Measurement and IOA

The dependent variables were the rate of problem behavior outside of TO, percentage of opportunities in which the subject complied with the TO demand, and average TO duration for each condition. Compliance with the TO demand was defined as being in the TO area within 10 s of the TO demand. The TO demand was in the form of, "You may not _____. Go to TO."

For subjects whose problematic behavior occurred on the playground, breaking playground rules was considered problematic behavior. The schools in which the subjects were enrolled had similar playground rules; including, students may only use the slide going down on their bottoms, students may not push or hit other students, students may only swing on the swings on their bottoms going in a front-to-back motion, students may not pick up or throw mulch, students may not leave the playground area without permission from a teacher, etc. (a complete listing of playground rules for each school is available upon request). School rules were designed to prevent behavior that could be dangerous to the student or other students or cause property damage.

For Brandon and Gary, breaking house rules was considered problematic behavior. Breaking house rules for Brandon and Gary included, taking toys from another person's hands, throwing toys, destroying block structures other people had made without asking, refusing to comply with an adult's request within 10 s, and hitting or kicking or attempting to hit or kick another individual.

A second observer collected data during 35%, 21.4%, 48%, 59.3%, 59.2%, and 52.2% of sessions for Adam, Ricky, Austin, Brandon, Stevie, and Gary, respectively. Mean proportional IOA for problem behavior was 94.2%, 92.6%, 97.3%, 98.2%, 94.8%, and 99.4% for Adam, Ricky, Austin, Brandon, Stevie, and Gary, respectively.

A second observer also collected latency data from the time the TO demand was issued until the subject was in the TO area for all subjects. IOA for compliance with the TO demand was collected during 35.7%, 41.2%, 87.5%, 12.5%, 15%, and 71.4% of sessions for Adam, Ricky, Austin, Brandon, Stevie, and Gary, respectively. Low percentages of IOA were captured for compliance for some subjects, because those subjects rarely went to TO; hence, when a second observer was present it was relatively unlikely that an IOA opportunity would occur. IOA was calculated by determining the latencies to each TO within each session and scoring an agreement if both observers recorded the latency as equal to or under 10 s or over 10 s (i.e., compliance or noncompliance), and dividing the number of agreements by the total number of TOs. Mean latency IOA was 80%, 100%, 88.1%, 100%, 66.7% (the result of one session with one TO and a disagreement), and 80% for Adam, Ricky, Austin, Brandon, Stevie, and Gary, respectively.

Procedure

Baseline

During baseline, no programmed consequences were provided for problem behavior. Subjects whose sessions took place on the playground were provided free access to playground equipment and other students, and attention was available from teachers and experimenters, if requested. Subjects whose sessions took place in the home were provided free access to toys and other preferred items, and an experimenter provided attention continuously.

TO conditions

Immediately following baseline, each subject was reminded of the playground or house rules. Sometimes new playground rules were developed during the study. For example, on one playground, giant tires were added and new rules about the tires were created, such as, tires may be rolled, but not stacked. Additionally, weather-related playground rules were also in place during some sessions (e.g., no sliding down wet slides). An experimenter informed children of any new or transient rule in place prior to the start of the session. In all subsequent sessions, any violations of that rule were scored as breaking a rule and resulted in TO.

4-min TO. Prior to the start of a session, an experimenter told the subject, “If you break any of the [playground or house] rules, you will be sent to TO for 4 min, no matter how quickly you get there.” During the 4-min TO phase, subjects were sent to TO contingent on every instance of breaking playground or house rules. The experimenter waited 10 s after issuing the TO demand prior to escorting the subject to TO using a least-to-most restrictive prompting procedure, beginning with a gentle hand on the back to carrying the subject to TO, if necessary.

1-or 4-min TO. Prior to the start of the session, an experimenter told the subject, “If you break any of the [playground or house] rules, you will be sent to TO for 4 min, *but* if you go to TO right away, make it to TO in 10 s or less, then you will only have to stay for 1 min. If I have to help you to TO, you will have to stay for 4 min.” The 1- or 4-min TO condition was identical to the 4-min TO condition except that if the subject reached the TO area in 10 s or less, he only had to stay in TO for 1 min. If the subject took longer than 10 s to get to the TO area, he had to stay in TO for 4 min.

1-min TO. Gary was the only subject to experience this condition. Prior to the start of the session, Gary was told, “If you break any of the house rules, you will be sent to TO for 1 min, no

matter how quickly you get there.” Other than duration, the 1-min TO condition was identical to the 4-min TO condition.

Results

Figure 3-1 displays problem behavior per minute across phases for each subject. Problem behavior during baseline was high and decreased during TO phases for all subjects. Problem behavior decreased in both the 4-min TO and 1- or 4-min TO conditions to approximately equal levels. Separation can be seen between the two TO conditions in the final TO phase for Ricky, however, because Ricky’s compliance did not improve in the 1- or 4-min condition (Figure 3-2), both conditions were essentially 4-min conditions (i.e., the slight separation was most likely coincidental). Austin’s final TO phase was very brief because the school year ended, so sessions could no longer be conducted on the school playground. Gary’s problem behavior in the 1-min TO condition conformed to one of two patterns in each session: He either followed the rules and engaged in no problem behavior throughout the session or was sent to TO once and immediately engaged in problem behavior following TO several consecutive times. That is, Gary either experienced no TO or several consecutive 1-min TOs. Following the consecutive TOs in sessions 40 and 43, Gary engaged in no other problem behavior for the remainder of the sessions.

Figure 3-2 shows the percent compliance with the TO demand across conditions for all subjects. Ricky and Adam remained noncompliant in both TO conditions; however, Stevie, Austin, Brandon, and Gary complied with the TO demand considerably more in the 1- or 4-min TO condition than in the 4-min TO condition. Gary’s compliance in the 1-min TO condition decreased to 20%, well below his average compliance during the 1- or 4-min condition.

Figure 3-3 displays the average TO duration across conditions for all subjects. During the 4-min and 1-min conditions, the average is fixed at 4 min and 1 min, respectively, but is displayed for comparison. On average, all subjects spent less time in TO during the 1- or 4-min

condition than in the 4-min condition. On average, Gary spent more time in TO during the 1- or 4-min TO condition than during the 1-min TO condition.

Discussion

TO was effective at reducing the problem behavior of all 6 subjects. Both the 4-min TO and the 1- or 4-min TO procedures maintained low levels of problem behavior. The 1-min TO (Gary only) produced unusual results: Either the instruction that problem behavior would result in TO completely suppressed problem behavior or Gary required multiple consecutive TOs but no other TOs throughout the session. For all subjects, TO occurred in the context of recess at school or free play time at home, making the discrepancy between TO and time-in salient. Subjects could access many potential reinforcers in the form of attention from peers and adults, and either various types of playground equipment (e.g., slides, swings, tunnels, monkey bars) or toys and games. The wide variety of potential reinforcers reduced the likelihood of satiation from any particular reinforcer and probably increased the aversiveness of TO, in which access to all reinforcers was restricted.

The 1- or 4-min TO produced increases in compliance with the TO demand for 4 of 6 subjects. As a result, TO implementation effort for those 4 subjects was greatly reduced; TO application required only the verbal instruction and no physical guidance. Although the brief TO remained effective at reducing problem behavior during time-in, the reduction in TO duration functioned as a reinforcer for complying with the TO demand. The 1- or 4-min TO did not increase compliance with the TO demand for 2 of 6 subjects. Anecdotally, these subjects did not appear to understand the verbal instruction stating the contingency that compliance with the TO demand in the 1- or 4-min condition resulted in a shorter TO. Future research should assess comprehension of the verbal instructions, possibly by having the subjects tell an experimenter the contingency and role play potential scenarios. Additionally, noncompliance with the TO

demand in the 1- or 4-min condition resulted in a 4-min TO, making the conditions indistinguishable when compliance did not occur. One potential way to remedy this limitation could be to state to the subject how long each TO will be and why (e.g., “You only have to stay in TO for 1 min, because you ran to TO on your own” or “You will have to stay in TO for 4 min, because you did not go to TO when I asked”). Another possible way to increase the discriminability of the conditions would be to countdown from 10 after issuing the TO demand in the 1- or 4-min condition.

Another potential limitation of this study was that the distance to the TO area was not constant. A subject could choose to play right next to a TO area or could play on the opposite side of the playground or room. On a few rare occasions, Ricky walked independently to TO, but did not meet the 10 s criteria. To address this issue, multiple TO areas were created on the playgrounds for Adam and Austin so that they would be able to easily reach the TO area within 10 s from anywhere on the playground.

Despite having no effect on the compliance of 2 subjects, the 1- or 4-min procedure should be recommended for children who refuse to go to TO. The procedure was no more difficult to implement than the 4-min TO and greatly reduced implementation effort when compliance with the TO demand increased. Additionally, children could spend, on average, less time in TO but maintain approximately the same low levels of problem behavior as with a fixed 4-min TO. A couple of simple modifications to make the procedure more effective for all children were described above and would not substantially increase the difficulty or implementation effort of the 1- or 4-min TO procedure. Future research should evaluate these modifications to determine if they do, in fact, improve the effectiveness of the 1- or 4-min TO procedure.

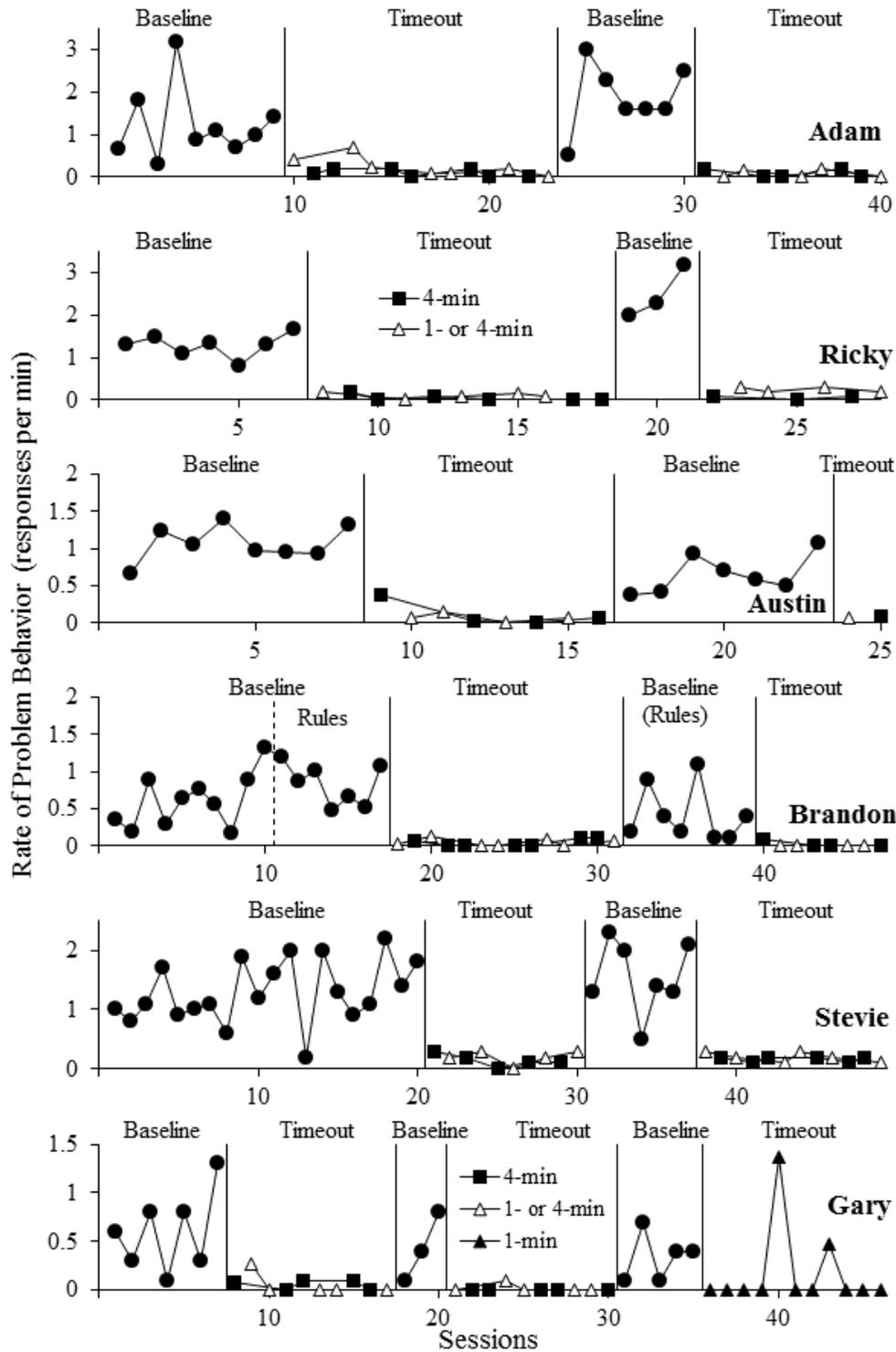


Figure 3-1. Rate of problem behavior (responses per min) across sessions for each subject. 4-min TO sessions are denoted by closed squares, 1- or 4-min TO sessions are denoted by open triangles, and 1-min sessions are denoted by closed triangles (Gary only). The dashed horizontal line on Brandon's graph indicates when the rules were stated to Brandon during baseline.

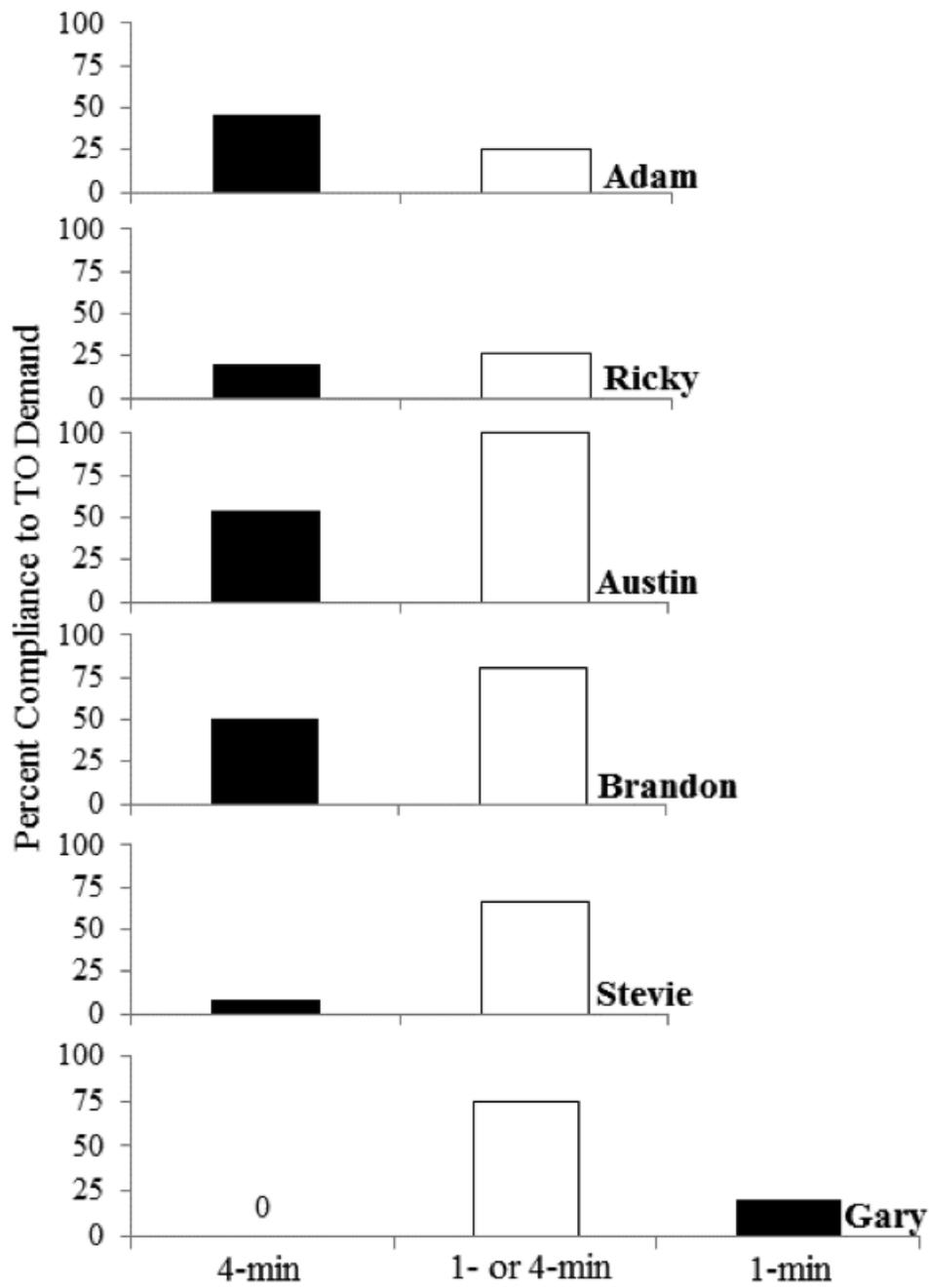


Figure 3-2. The percentage of compliance with TO demands in each condition for all subjects.

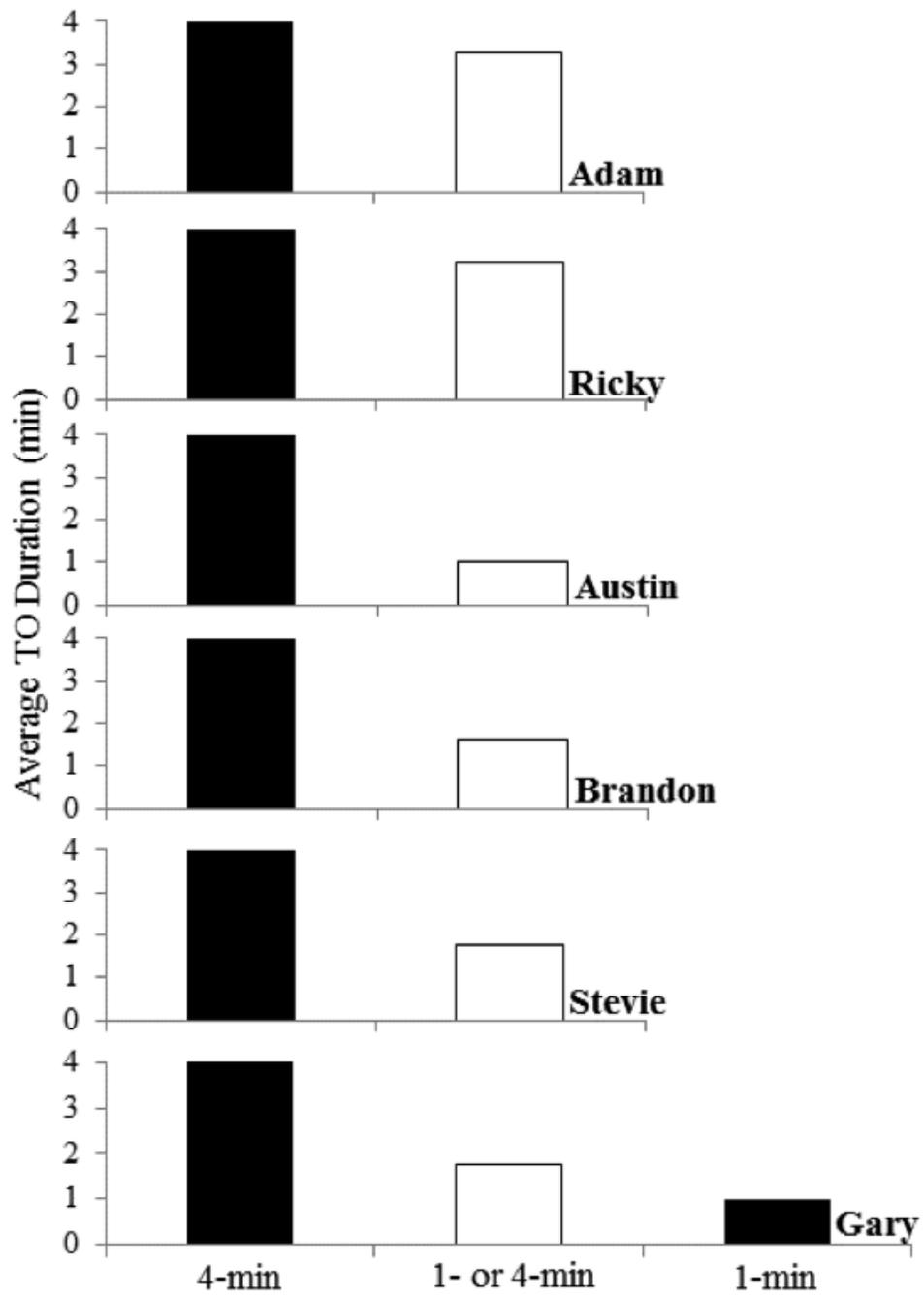


Figure 3-3. The average TO duration in each condition for all subjects.

CHAPTER 4

STUDY 2: TIME-OUT PROCEDURES WITH AND WITHOUT RELEASE CONTINGENCIES

Release contingencies require that TO remains in place until the individual has engaged in no problem behavior for a specific amount of time. There are two general release contingency procedures: (a) resetting the TO duration such that the individual must engage in no problem behavior for an entire TO interval (e.g., if the TO interval is 5 min, the individual must remain in TO 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 TO interval (e.g., if the TO interval is 5 min, the individual may be required to engage in no problem behavior during the final 30 s of TO or TO is extended until 30 s elapse with no problem behavior). Mace et al. (1986) reported that release contingencies have been suggested as a means to reduce the likelihood that problem behavior in TO will be adventitiously reinforced by release from TO. Release contingencies may also decrease the risk posed by problem behavior that both persists during TO and continues after TO (e.g., severe aggression).

Many studies evaluating TO procedures have incorporated a release contingency in the TO procedure (e.g., Bean & Roberts, 1981; Bostow & Bailey, 1969; Clark et al., 1973; Iwata, Rolider, & Dozier, 2009), but only a few studies have specifically evaluated release contingencies relative to the effectiveness of TO in general and to reductions in problem behavior during TO in particular (Erford, 1999; Hobbs & Forehand, 1975; Mace et al., 1986). The Hobbs and Forehand and Erford studies both found release-contingency TO to be more effective than fixed-duration TO. Unfortunately, the generality of these results is somewhat limited because both studies reported the results only as statistical tests and mean values within groups (no individual subject data were reported). Other technological or methodological limitations preclude drawing robust conclusions about the efficacy of TO with and without

release contingencies (e.g., all of the data in the Erford study were collected by the parents, and no IOA data were reported).

Despite a lack of conclusive findings about the use of a release contingency, some authors of non-empirical articles offering clinical advice (e.g., Reitman & Drabman, 1996) and authors of commonly used textbooks (e.g., Cooper, Heron, & Heward, 2006; Miltenberger, 2007) recommend using release-contingency TOs. The Cooper et al. text states, “Under no conditions should time-out be terminated if any inappropriate behavior is occurring” (p. 362). If problem behavior in TO is predictive of problem behavior outside of TO, a release contingency should be recommended; however, if a release contingency is used without necessity, individuals may spend inappropriately long durations of time in TO. Given the mixed findings and limitations of the previous literature, further research evaluating the effects of including a release contingency in TO procedures is warranted to provide empirical evidence for clinical recommendations.

A couple of single-subject studies provided individual subject 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 TO (Mace et al.) or restraint (Luiselli et al.) without a release contingency, and the release contingency resulted in TOs or restraints that were longer than necessary. Mace et al. compared the effects of release-contingency and fixed-duration TO procedures on the problem behavior of three subjects with developmental disabilities using an ABAC reversal and a multiple baseline across settings design. They found both TO procedures were effective at reducing or eliminating problem behavior, neither procedure reduced problem behavior in TO, and the release-contingency TO resulted in longer TOs. However, there were several potential limitations of the Mace et al. study. First, the baseline consisted of providing attention contingent on problem behavior. Simply withholding

attention may have substantially reduced problem behavior such that TO was unnecessary. A second potential limitation of the Mace study was a floor effect; TO eliminated nearly all problem behavior, limiting comparisons between the two TO procedures.

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 subjects. For one of these subjects, no differences were apparent across the two procedures. For the other subject, a decreasing trend occurred throughout both procedures, making the results inconclusive. An ABAB reversal design was used for the third subject, 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 TO to a fixed-duration TO procedure to determine whether or not pre-school-age children should remain in TO until no problem behavior is occurring.

Method

Subjects and Setting

Four children 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 diagnosed with autism spectrum disorder. He had no recognizable

vocal verbal repertoire. Adam was a typically developing 4-year-old boy in a general education pre-school classroom. Jackson was a 4-year-old boy labeled by the school as having a developmental delay. Forrest was a 3-year-old boy diagnosed with autism spectrum disorder; he made a few vocal word approximations but communicated mostly through signs.

Sessions took place in the location where problem behavior was most frequently occurring, 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 pre-school. 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 and 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 provided.

Response Measurement and IOA

All responses were selected based on teacher or parent report that the responses were problematic, and previous attempts to reduce responding were unsuccessful. "TO-producing responses" were those that resulted in the therapist implementing a TO contingent on the behavior. For all subjects, the most problematic responses, according to their teachers and

parents, were selected as TO-producing responses. At first glance, the TO-producing responses may appear “sub-clinical” or relatively mild. However, in all cases, the responses were selected because such behavior had previously 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 school administrators deemed these forms of behavior as target responses that should produce TO. Delay-producing responses were any problematic responses during TO; in the release-contingency TO condition, delay-producing responses resulted in an extension of the TO interval. In some cases, the delay-producing responses were actually more severe than the TO producing responses (e.g., aggression). This occurred in situations when the more severe behavior was rarely observed outside of TO but seemed to be a side effect of TO. The dependent variables were the rate of problem behavior during time-in, during TO, and, for some subjects, the percentage of the TO duration in which crying occurred.

Harold’s TO-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. Harold’s delay-producing responses were screaming, crying, aggression, and disruption. Crying was defined as visible tears or furrowing 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 TO rug or colored card used as a discriminative stimulus (described below). Crying, aggression, and disruption were defined the same way for the other subjects, unless otherwise specified.

Adam’s TO-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 of 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, upon request). Adam's teacher created all of the playground rules and the teacher reported that TO was a typical consequence for breaking any of the rules; however, throughout the study, the teacher only occasionally sent other students to TO for breaking a rule. Crying was recorded outside of TO but did not produce TO. Adam's delay-producing problematic responses were crying, aggression, disruption, talking, and escape. Disruption was defined as standing on the TO 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 TO bench after TO had started.

Jackson's TO-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 were also recorded outside of TO, but did not produce TO. Jackson's delay-producing responses were crying, aggression, disruption, and talking. Talking was defined in the same way as for Adam.

Forrest's TO-producing behavior was throwing or swiping (off of 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 of TO, but did not produce TO. Forrest's delay-producing responses were crying, aggression, and disruption.

A second observer collected data during 47.5%, 53.3%, 48.6%, and 38.7% of TO evaluation sessions for Harold, Adam, Jackson, and Forrest, respectively. Mean IOA was 97.2%, 96.2%, 98.3%, and 97.1% for TO evaluation sessions for Harold, Adam, Jackson, and Forrest, respectively.

Procedure

The relative effectiveness of the TO procedures was evaluated using an ABAB reversal design. The two TO procedures were compared during the B phases in a multielement design. If more than one session was conducted in a day, the order of the two types of TO sessions was counterbalanced. 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. 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 TO session, subjects were shown a colored card (0.40 m x 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 easily seen throughout the session and from the TO area. The therapist provided Adam and Jackson with verbal instructions stating 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 their limited verbal repertoires (both receptive and expressive) and histories of poor compliance with instructions.

During TO, the timer was visible to all subjects while in TO, although none of them appeared to look at it. Physical guidance to TO was never required for Jackson, but Harold, Adam, and Forrest sometimes required physical guidance to TO. The TO 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.

Baseline

The regularly scheduled activity occurred (free-play time 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 such that Adam 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 (c.f., Solnick, Rincover, & Peterson, 1977).

Fixed-duration TO

Prior to the start of each session, the therapist showed the yellow card to the subject. Additionally, the therapist told Adam and Jackson, "If you are sent to TO, you only have to stay for 4 min, no matter what." The yellow card was then placed prominently in the session area. TO was delivered contingent on every instance of problem behavior and resulted in a fixed-duration 4-min TO.

Release-contingency TO

Prior to the start of each session, the therapist showed the red card to the subject. Additionally, the therapist told Adam and Jackson, “If you are sent to TO, you will have to stay for 4 min, but you cannot leave TO until you are calm.” The red card was then placed prominently in the session area. A 4-min TO was delivered contingent on every instance of problem behavior. If a delay-producing response occurred during the last 30 s of TO, the TO 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 TO interval was being extended.

Results

Figure 4-1 shows the rate of TO-producing problem behavior across sessions for each subject. Both TO procedures effectively reduced problem behavior for all subjects and in both settings for Forrest. Problem behavior reemerged during the return to baseline condition for all subjects. 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 and Forrest’s return to baseline produced lower levels of problem behavior than observed in the initial baseline, but still higher than TO conditions. When TO was reintroduced, the problem behavior of all subjects decreased.

Figure 4-2 shows the rate of delay-producing problem behavior that occurred in TO during both TO phases for each subject. 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 delay-producing response that occurred consistently, and there was no observable difference between TO conditions for other delay-producing problem behavior. During the first TO phase, Harold engaged in delay-producing behavior

during TO at a variable, but approximately equal level in both conditions. During the second TO 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 TO was so effective at decreasing Jackson's inappropriate behavior, there are very few data points in both TO phases to be compared; however, there was no apparent difference between the conditions. The most common delay-producing behavior for Jackson was talking. Forrest did not go to TO at all in the release contingency condition during the first phase of TO at school, so no comparison between the conditions can be made during that phase. During the second TO phase at school, Forrest cried at approximately equal levels in both conditions. At home, Forrest cried in both conditions during both TO phases; he cried equally in both conditions during the first TO phase and more during the fixed-duration TO condition in the second TO phase.

Figure 4-3 shows cumulative records of all problem behavior (both TO-producing and delay-producing behavior) for one fixed-duration TO session for each subject and one for each setting for Forrest. We selected representative sample records after ensuring that problem behavior occurred during the final 30-s of TO. These graphs show within-session patterns of problem behavior both in session and in TO. If problem behavior at the end of the TO interval was likely to persist following release from TO, steps up in the graph should be observed immediately following TO. Also, the probability of problem behavior immediately following TO should be higher when problem behavior occurred at the end of the TO interval. These graphs

provide examples of instances when problem behavior was occurring in TO and within the last 30 s of TO but did not persist upon release from TO and are representative of sessions in which the TO-producing problem behavior occurred. Problem behavior occurred during the last 30 s (of the first 4 min) of TO 42% of TO 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 TO were observed; delay-producing behavior was not more likely to occur at the beginning or end of TO. We also calculated conditional and background probabilities of problem behavior occurring within the first min after release from TO (Vollmer, Borrero, Wright, Van Camp, & Lalli, 2001). The conditional probability was defined as the probability that problem behavior occurred within the first min after release from TO given that problem behavior occurred during the last 30 s of TO. The background probability is the probability that problem behavior occurred within the first min after release from TO regardless of whether or not problem behavior occurred in the last 30 s of TO. Both the conditional and background probabilities were zero for Adam, Jackson, and Forrest. They never engaged in problem behavior within the first min after being released from TO. Harold was the only subject who engaged in problem behavior within the first min after being released from TO, but did so only rarely (conditional probability = .18, background probability = .37).

Average TO duration was considerably longer in the release-contingency TO condition for most of the subjects. The fixed-duration TO necessarily averaged 4 min, and the contingent release TO 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 TO and release-contingency TO were effective at reducing the problem behavior of all subjects (and in two settings for one subject). All subjects engaged in

problem behavior during TO in both conditions. Harold and Forrest, at home, engaged in less problem behavior during TO when a release contingency was in place during the second TO phase. However, the release contingency did not eliminate the occurrence of problem behavior. All other subjects engaged in problem behavior at approximately the same level in both TO conditions. Thus, the release contingency did not eliminate problem behavior during TO for any subjects, and only reduced problem behavior during TO for two subjects (and only in one setting for Forrest) during one phase. Additionally, problem behavior during TO was not predictive of problem behavior outside of TO. For all but one subject, problem behavior never occurred within the first min of being released from TO. One subject did engage in problem behavior in the first min of after being released from TO, but only very rarely and even less so when problem behavior occurred during the last 30 s of TO. The notion that children should not be released from TO if problem behavior is occurring during TO because the problem behavior will persist outside of TO was not supported by these data. In addition, the results do not support that problem behavior during TO is likely to be adventitiously reinforced by release from TO. 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 during TO is conceptualized as “superstitious,” as suggested by calling release from TO 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 TO procedures are typically arranged (particularly if TO durations are long) makes superstitious

behavior unlikely. Problem behavior during TO is less likely to result in reinforcement (release from TO) than to result in no reinforcement (staying in TO). Also, the use of a timer during a fixed-duration TO makes the contingency more explicit and reduces the likelihood of any superstitious behavior developing. An alternative explanation to why problem behavior occurs during TO is that some problem behavior during TO (e.g., crying) is elicited by aversive stimulation. Future research is needed to determine the cause(s) of problem behavior during TO, and to develop ways to reduce problem behavior during TO. Although problem behavior during TO was not predictive of problem behavior after TO, problem behavior during TO makes TO implementation aversive for caregivers and teachers and, if severe enough, can possibly rule out TO as a potential treatment. During the release-contingency TO condition, the only programmed contingency for problem behavior was during the last 30 s of the TO interval. A more effective way to decrease problem behavior throughout TO may be to signal that time is being added to the TO interval following each instance of inappropriate behavior.

Also, future research should evaluate the conditions under which side effects do and do not occur during TO procedures. Problem behavior during TO may not occur with all individuals. Determining the conditions under which problem behavior does not occur during TO could lead to developing procedures after TO that make problem behavior during TO less likely. For example, a reduction of the TO interval contingent on appropriate behavior rather than an increase of the TO 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 TO procedures with good treatment integrity if TO does not produce problem behavior during TO.

Some limitations of the study warrant mentioning. First, the subjects had limited contact with contingencies due to the effectiveness of TO and, for Harold, problem behavior during TO only extended TO briefly, making the TO 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 subjects, and pre-session instructions were used for two subjects). Finally, the 10-min limit on TO sometimes resulted in a fixed-duration 10-min TO during the release-contingency TO condition (i.e., some subjects engaged in problem behavior continuously during TO and never met the 30 s criterion to be released). However, no subject experienced a 10 min TO for all TOs 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 subjects 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 during TO and immediately following TO. None of the subjects in this study engaged in problem behavior immediately following TO. However, some individuals may continue to engage in problem behavior immediately following TO if they are engaging in problem behavior when the TO time elapses. Problem behavior did occur at the end of the TO interval during the fixed-duration TO condition for all subjects (examples of which are shown in Figure 4-3), so the overall likelihood of problem behavior immediately following a fixed-duration TO, while unknown, may be fairly low. However, one such circumstance in which problem behavior following TO may be more

likely is if a child engaged in severe aggression prior to TO and there is concern that the child would engage in severe aggression toward the same individual upon being released from TO. However, no data suggest that a release contingency would prevent aggression from occurring upon release from TO. In a situation involving severe, peer-directed aggression, TO may not be the most appropriate treatment option.

A fixed-duration TO procedure should be considered first because there was no apparent benefit to including a release contingency, release contingencies resulted in longer TOs, and the effort required to implement a release-contingency TO procedure is greater than that required to implement a fixed-duration TO procedure.

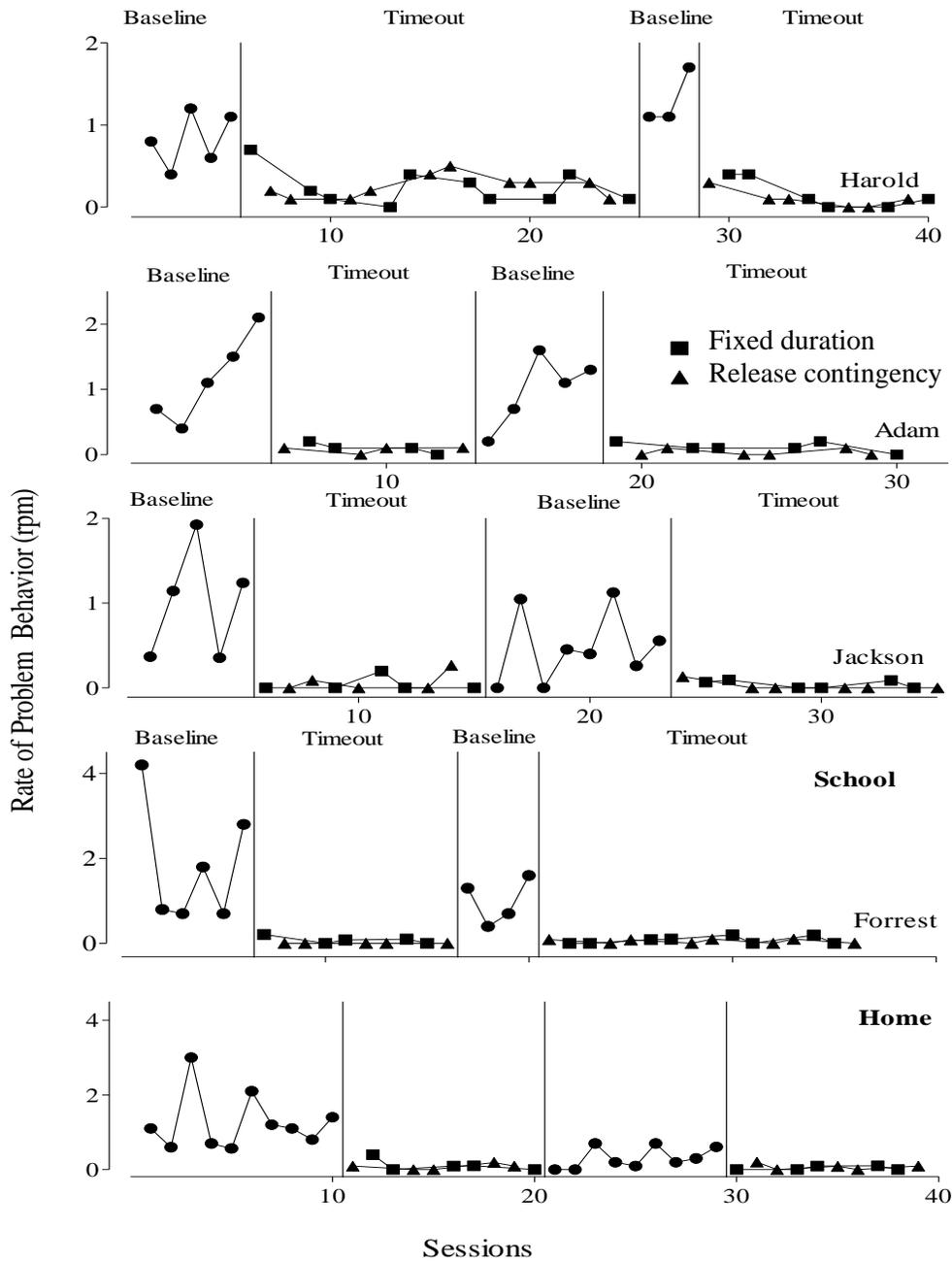


Figure 4-1. Rate (in responses per min) of timeout-producing problem behavior across sessions for each subject. Problem behavior during the fixed-duration timeout sessions are denoted by squares and release-contingency TO sessions are denoted by triangles. The data in the fourth panel were collected at Forrest’s school, and the data in the bottom panel were collected at Forrest’s home.

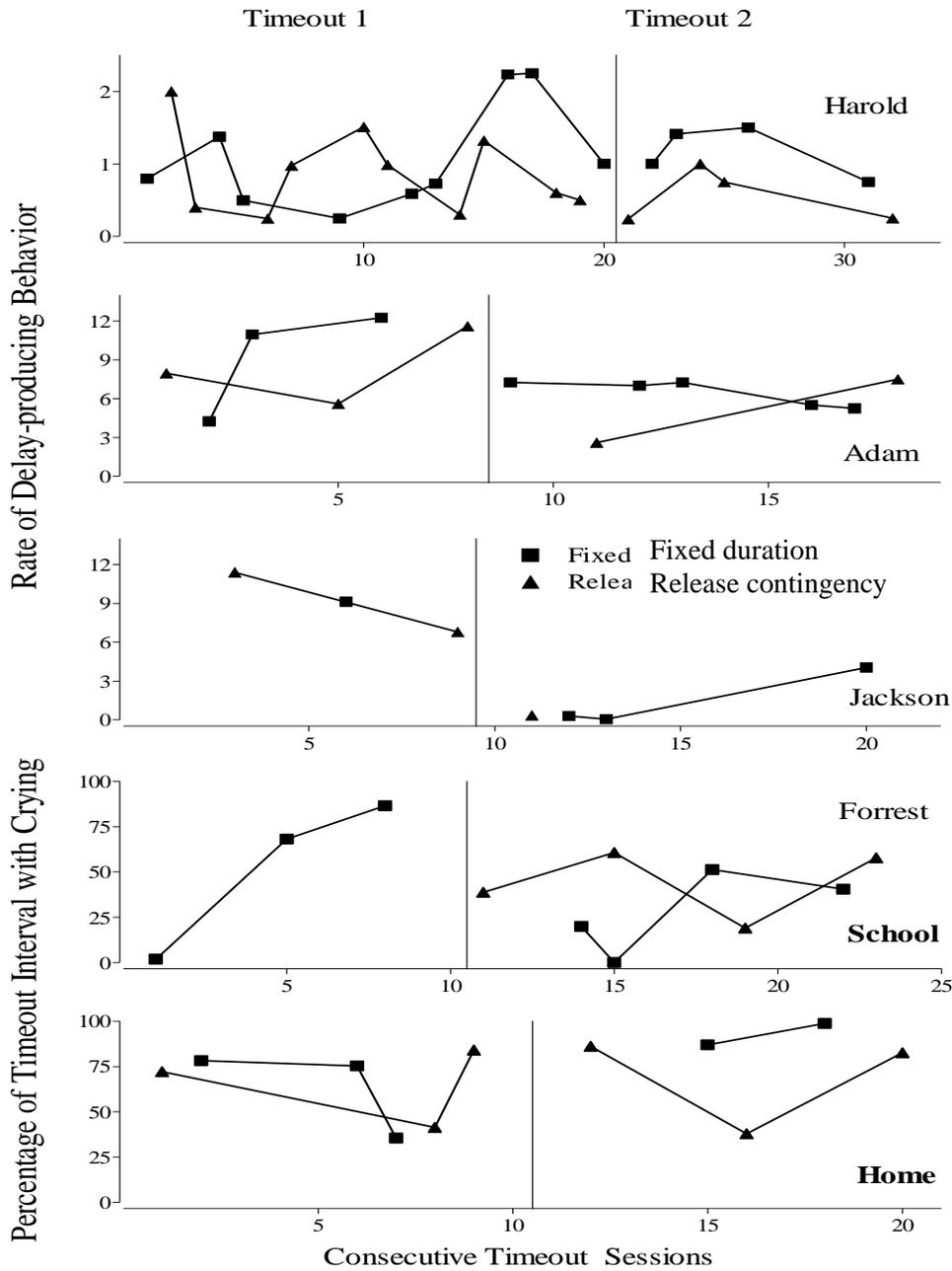


Figure 4-2. The top three panels show the rate (in responses per min) of delay-producing problem behavior for Harold, Adam, and Jackson. The bottom two panels show the percent of the session in which crying occurred for Forrest at school and at home. Consecutive TO sessions are along the x-axis in each panel. Problem behavior during the fixed-duration TO sessions are denoted by squares and release-contingency TO sessions are denoted by triangles.

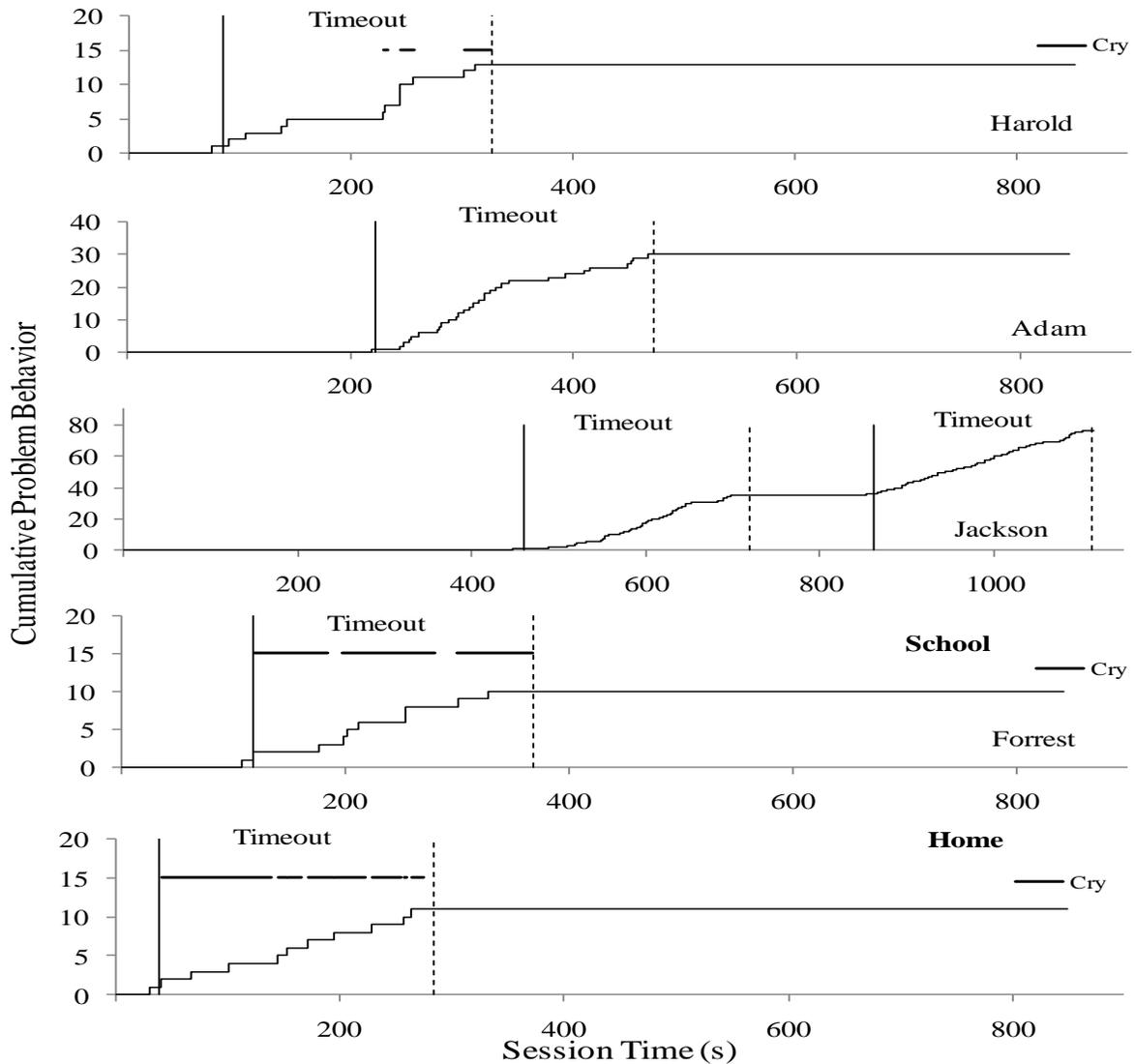


Figure 4-3. One fixed-duration TO session is shown for each subject (sessions 37, 23, and 11 for Harold, Adam, and Jackson, respectively), and one session for each location for Forrest (sessions 14 and 34 at school and home, respectively) to show the relationship between problem behavior in TO and problem behavior following TO. Cumulative TO- and delay-producing problem behavior is shown across session time (in s). Crying was recorded as a duration measure and a dark horizontal line above the cumulative record shows when crying was occurring. Vertical solid lines mark the start of TO, and dashed vertical lines mark the end of TO.

CHAPTER 5
STUDY 3: THE EFFECTS OF WARNINGS ON INTERMITTENT TIME-OUT

Another parameter of TO described by MacDonough and Forehand (1973) is the use of a warning prior to implementing TO. Although many studies evaluating TO have used warnings as part of their TO procedure (e.g., O'Brien & Azrin, 1972; Roberts & Powers, 1990; Scarboro & Forehand, 1975; Wasik, Senn, Welch, & Cooper, 1969), only two studies have directly evaluated the use of warnings (Roberts, 1982; Twyman et al., 1994). In a group design with single baseline and treatment sessions, Roberts compared TO with and without warnings and found that both were equally effective at reducing problem behavior, but that the children in the TO groups with warnings went to TO fewer times. Twyman et al. also compared TO procedures with and without warnings, but found that TO without warnings produced greater levels of compliance with TO. However, in the condition in which warnings were delivered, three warnings were delivered prior to implementing exclusion TO; it is possible that warnings could have been effective if followed by exclusion TO on a denser schedule (i.e., every time).

The delivery of warnings for problem behavior involves implementing TO on an intermittent schedule. Several studies have shown that intermittent TO can be effective (Barton, Brulle, & Repp, 1987; Clark et al., 1973; Haynes & Geddy, 1973; Lerman, Iwata, Shore, & DeLeon, 1997; Calhoun & Lima, 1977; Calhoun & Matherne, 1975). Also, Dorsey, Iwata, Ong, and McSween (1980) demonstrated that pairing "No" with contingent water mist could effectively condition "No" as a punisher, suggesting that warnings may become conditioned punishers if consistently followed by TO.

The purpose of Study 3 is to evaluate the effectiveness of warnings to TO, first by directly comparing TO with warnings to TO without warnings, then by attempting to thin the TO schedule while maintaining the warnings.

Method

Subjects and Setting

Subjects were 3 young children who could respond to basic verbal instructions. Damien was a 5 year-old boy in pre-school, Jackson was a 6 year-old boy in kindergarten, and Keenan was a 3 year-old boy in pre-school. No subjects had any formal diagnoses (Jackson previously participated in the release contingencies evaluation, during which time he had been labeled by the school as having a developmental delay, but by this time he no longer had the developmentally delayed label).

Damien's sessions took place on the playground at school when his class was at recess. The playground contained monkey bars, large plastic and metal playground equipment with slides, a wagon, and sand toys. TO for Damien was located on a carpet square on the sidewalk next to the playground. Jackson's sessions took place in his classroom during group instruction time, in which his teacher read books, the class sang songs, and calendar activities occurred. Jackson's TO location was in a chair on the corner of the room that the teacher had designated as the classroom TO location. Keenan's sessions took place in a small area of a room that contained two chairs, puzzles, books, and a shape sorter. An experimenter served as teacher and read books, asked questions about colors, shapes, and counting, and helped with puzzles and shape sorting. Keenan's TO involved removing all items from the session area.

Response Measurement and IOA

The dependent variable was the rate (in responses per min) of the target problem behavior, defined individually for each subject, across conditions. Damien's target problem behavior was aggression, defined as pushing, hitting, kicking, pinching, spitting on, or throwing objects or sand at others. Keenan's target problem behavior included both aggression and disruption. Keenan's aggression was defined the same as Damien's, but also included hair

pulling. Disruption for Keenan was defined as throwing objects, biting books, tearing or attempting to tear books, banging toys, rocking his chair, and getting out of his seat and walking at least two steps away from his chair. Getting out of his seat was included in the definition because it would be very disruptive during circle time in his class, and his teacher hoped Keenan would eventually be able to join the class for circle time. Jackson's target problem behavior was disruption in the form of getting out of his seat without teacher permission or rocking in his chair.

A second observer collected data during 63.1%, 63%, and 29% of sessions for Damien, Jackson, and Keenan, respectively. Mean IOA was 98.2%, 98.2%, and 93.8% for Damien, Jackson, and Keenan, respectively.

Procedure

The effects of TO with and without warnings were evaluated in a reversal design, in which baseline phases are alternated with warning and TO phases. Some TO phases contain a multielement comparison of TO with and without warnings. All warnings to TO included either a statement of the inappropriate response (Damien) or a statement about the rule (Jackson and Keenan) and a contingency statement about TO (e.g., "If you push someone again, you will have to go to TO." or "If you cannot sit nicely, you will have to go to TO."). No other instructions about TO or discriminative stimuli to signal which condition the subject was in were provided. In all conditions, attention was available from teachers and experimenters for Damien and Jackson, if they asked or raised a hand. Attention in the form of reading books, asking questions about the stimuli, giving high fives, tickles, and hugs for answering questions and working on puzzles or shape sorters was continuous for Keenan from the experimenter serving as teacher.

Baseline

No programmed consequences were delivered contingent on the target problem behavior. Aggression was physically blocked to prevent harm to others, but nothing was said about the aggressive response. Disruption that could lead to physical harm or damage to property (e.g., rocking in chair or attempting to tear books) was also blocked, and nothing was said to the subject.

Warnings

The first response resulted in a warning, and all subsequent warnings were delivered on a fixed ratio 2 (FR 2) schedule (i.e., warnings were delivered every other time the target problem behavior occurred). TO was never implemented. Problem behavior that did not result in a warning was ignored or blocked, if necessary.

FR 1 TO

TO was implemented on an FR 1, or continuous, schedule (i.e., every time the target problem behavior occurred). No warnings were delivered. The TO procedure described in the general method was used.

FR 2 TO

TO was implemented on an FR 2 schedule. No warnings were delivered. The TO procedure described in the general method was used.

FR 2 TO vs. conjoint FR 2 warnings FR 2 TO

FR 2 TO sessions were conducted as described above. FR 2 TO sessions were alternated with sessions in which the first response produced a warning, and thereafter, the consequences for a response alternated between TO and a warning. The TO procedure described in the general method was used.

VR TO vs. conjoint FR 1 warnings VR TO

This phase was identical to the *FR 2 TO vs. Conjoint FR 2 Warnings FR 2 TO* phase except that the schedule of TO was thinned until problem behavior reemerged, at which point the previous schedule that reduced problem behavior to an acceptable level was reinstated (Keenan and Jackson), or until the schedule was successfully thinned in one or both conditions (Damien). The criterion for schedule thinning was two consecutive sessions in both conditions with less than or equal to 0.10 responses per min of the target problem behavior. In the Conjoint FR1 Warnings VR TO condition, all responses produced a warning except the response that completed each ratio value, which resulted in TO.

Results

Figure 5-1 shows the rate of problem behavior in all phases for each subject. During baseline, Damien's rate of aggression was high and variable. Warnings alone decreased aggression, but not to acceptable levels. When TO was implemented on an FR 1 schedule, problem behavior decreased to near-zero levels. FR 2 TO was also effective at reducing aggression. During both reversals to baseline, problem behavior increased, but never to the levels observed during the initial baseline. When TO with warnings was directly compared to TO without warnings, both TO procedures remained effective throughout the schedule thinning procedure.

Jackson's baseline rates of disruption were also high and variable. Because Jackson participated in the release contingencies manipulation prior to this study (thus, the effects of FR 1 TO were known), the first TO phase in this study was FR 2 TO, which was effective at eliminating disruption. FR 2 TO was implemented prior to a warnings only phase for Jackson because Jackson already had a history of TO with the experimenters, so the effects of warnings without TO could not be assessed in the same manner as with the other 2 subjects. Warnings did

have a suppressive effect on Jackson's disruption, but did not reduce disruption to acceptable levels. FR 2 TO both with and without warnings was effective at maintaining near-zero levels of disruption (although some disruption reemerged immediately following winter break, during which no sessions were conducted). The schedule of TO was successfully thinned to a VR 2 schedule, but a VR 3 schedule did not maintain acceptably low levels of disruption. During the return to a VR 2 schedule, disruption again met the reduction goal (two consecutive sessions in each condition with a rate of problem behavior at or below 0.10 responses per min).

Keenan's rate of problem behavior was extremely high and variable during the initial baseline (note that his y-axis is considerably higher than that of any other subject). Warnings alone had no effect on problem behavior. FR 1 TO had an immediate suppressive effect on problem behavior, although problem behavior remained at unacceptably high levels for the first several sessions in TO. Problem behavior reemerged during both returns to baseline, however, to a lesser extent each time. FR 2 TO also effectively reduced problem behavior. During the comparison of TO with and without warnings, problem behavior remained low in both conditions until the schedule was thinned to VR 3 and problem behavior returned in both conditions. When the schedule of TO was returned to VR 2, problem behavior again met the reduction criteria. The long y-axis on Keenan's panel (third panel) makes observing changes in problem behavior difficult during the thinning phases, when problem behavior remained far lower than baseline levels but was still at inappropriately high levels. In order to make those changes more visible, the final baseline phase and TO with and without warnings comparison phase have been magnified below Keenan's panel.

Discussion

Both FR 1 TO and FR 2 TO schedules were effective at reducing or eliminating the target problem behavior of all subjects. The TO schedule was successfully thinned to at least a VR 2

with all participants. These findings are similar to those of Clark et al. (1973) who found that denser schedules of intermittent TO were effective, but VR 8 did not successfully suppress problem behavior. A VR 2 schedule is a more naturalistic schedule than an FR 1 or even FR 2 schedule, because even if parents and teachers are trying to implement TO on an FR 1 schedule, they will most likely not observe every instance of the problem behavior (parents may leave the room momentarily to answer the phone or teachers may be attending to other students). To obtain a VR 2 schedule of TO, parents and teachers need to implement TO with only about 50% treatment integrity, which is a feasible goal for most parents and teachers.

Warnings had suppressive effects for 2 of 3 subjects and also, anecdotally, had an apparent interrupting effect for those subjects. That is, when a warning was delivered, problem behavior that was ongoing immediately ceased (e.g., if Damien had started to push someone down the slide and a warning was delivered, he would immediately retract his hands and stop pushing). This interrupting effect may be what maintains the delivery of warnings by parents and teachers. Problem behavior in the condition when warnings were delivered in the absence of TO did not reduce to target levels, suggesting that parents and teachers would not persist in delivering warnings because of the effectiveness of warnings (warnings were not effective). Similar results were found by Phillips, Phillips, Fixsen, and Wolf (1971) when delivering threats during baseline; an initial suppressive effect occurred, but failed to maintain without additional consequences.

Additionally, even after warnings were consistently followed by TO, warnings did not become conditioned punishers and suppress problem behavior. If warnings had become conditioned punishers, problem behavior in the condition with warnings would have remained low when problem behavior reemerged in VR 3 for Jackson and Keenan. Damien's problem

behavior remained low in both conditions throughout schedule thinning, suggesting that the warnings were not necessary to maintain suppressed problem behavior. Future studies should evaluate how to condition warnings as punishers. One possibility may be to pair warnings with TO. In the present study, when a warning was delivered, TO was not delivered until problem behavior occurred again. In order to pair warnings with TO, a warning would be delivered and TO would immediately follow. Dorsey, Iwata, Ong, and McSween (1980) paired a verbal “No” with a water mist to the face and found that the verbal “No” functioned as a conditioned punisher in a novel setting in which the verbal “No” and the water mist had not been paired. Also, Foxx and Azrin (1973) conditioned a verbal warning by pairing the warning with an overcorrection procedure. Pairing was not done in this study because saying, “If you hit someone again, you will go to TO” and then sending the subject immediately to TO seemed peculiar, but close temporal pairing of the warning and TO may be necessary for warnings to develop conditioned punishing properties.

Keenan’s problem behavior during the warnings-only condition remained at high levels and, anecdotally, was not disrupted by the warnings either. Keenan was the youngest subject in this study and appeared to have little or no history with TO. Warnings are probably more likely to have a reinforcement effect on the behavior of individuals who have no history with TO, because some minimal attention is provided contingent on problem behavior. Once TO consistently followed warnings, warnings either no longer functioned as a reinforcer or did not provide enough of a reinforcer to maintain problem behavior in the presence of a TO contingency, evidenced by low levels of problem behavior during the VR 2 TO with warnings condition.

Another finding was the consistent decreases in baseline rates of problem behavior across baselines within each subject. One potential explanation for this is that the subjects had acquired more appropriate social skills with their peers during TO phases as a function of having to do something different. That is, if Damien is no longer pushing his peers, to interact with them he has to do something else that will not result in TO during the TO phases. Peers are likely to reinforce appropriate social behavior by initiating and continuing play with other peers who are playing appropriately (i.e., not pushing, hitting, or kicking them). This natural reinforcer of peer interaction that did not occur during the initial baseline may persist in baselines following TO phases and could maintain more appropriate behavior during those baseline phases. Unfortunately, data were not collected on changes in specific appropriate behavior during time-in, so the above explanation remains speculative. Future research should focus on secondary effects of TO, including changes in appropriate behavior during time-in.

One potential limitation of this study was the use of a multielement design to compare TO with and without warnings. The multielement design may have produced carryover effects such that being sent to TO in one session could reduce the likelihood of problem behavior in the next session. Although carryover effects may have occurred, if the warnings functioned as conditioned punishers, the problem behavior of Jackson and Keenan should have remained low in the warnings condition or both conditions when the VR 3 schedule was in place.

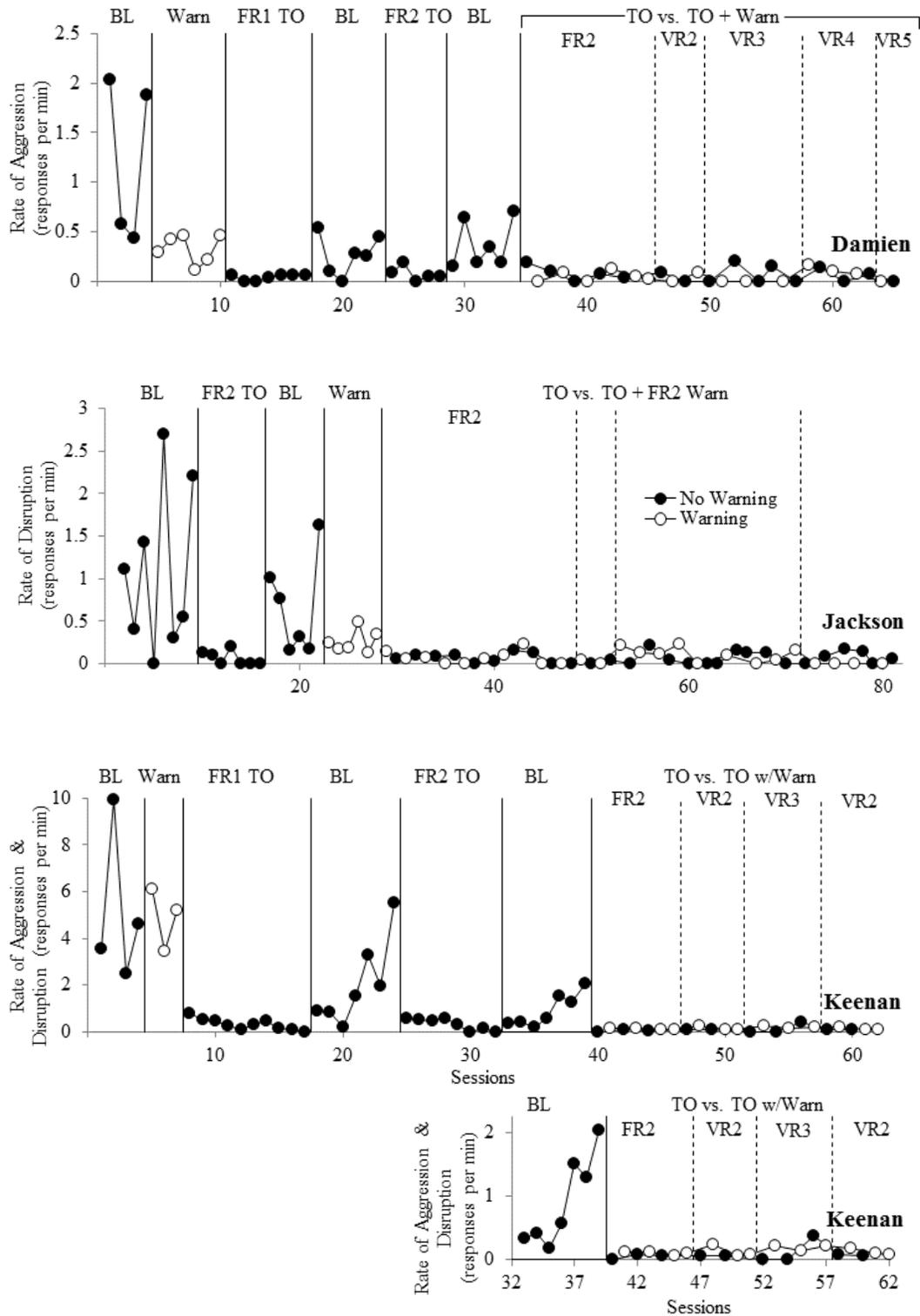


Figure 5-1. Responses per min of problem behavior across sessions for each subject. Warnings sessions are denoted by open circles. No-warnings sessions are denoted by closed circles. Vertical dashed lines designate when schedule thinning occurred.

CHAPTER 6 GENERAL DISCUSSION

This series of TO studies examined the parameters of application (Study 1), release (Study 2), warnings (Study 3), and schedule (Study 3). In all three studies, TO was effective at reducing the problem behavior of all subjects. Although this finding is not surprising, the effect of a brief, contingent observation TO was robust and provides good evidence for its continued use with young children in schools and at home. In all studies, time-in was designed to be enriched with many potential reinforcers. The enriched time-in environment, contrasted with the barren TO environment, creates what could be considered a salient differential reinforcement procedure. Differential reinforcement procedures involve providing a reinforcer contingent on appropriate behavior. Time-in could be conceptualized as a differential reinforcement procedure because subjects were given continuous access to possible reinforcers contingent on maintaining appropriate behavior during time-in. Differential reinforcement procedures also involve an extinction component in which reinforcers are withheld contingent on problem behavior. Instead of the extinction component, subjects were removed from the environment in which problem behavior occurred to an environment in which reinforcers cannot be accessed for any response and, in many cases, the problem behavior could not occur (e.g., pushing other students, throwing toys, jumping off of the swing).

Although the effects of the TO procedures used in these studies were robust, they should be considered in light of the population and target problem behavior selected. Contingent observation TO on a bench, chair, or carpet square may be impractical for older, larger individuals who engage in more severe problem behavior in TO or who try to elope from TO. The young children who participated in these studies did sometimes engage in aggression toward the TO therapist or try to elope from TO, but their size made blocking problem behavior and

escape feasible without injury. The extent to which different forms of TO (e.g., seclusion TO) would produce these same results is unknown, although many forms of TO have been shown to effectively reduce problem behavior (Brantner & Doherty, 1983).

Another potential limitation of these studies was that a floor effect occurred for most or all subjects in all of the studies, in which both TO conditions under comparison produced such substantial decreases in problem behavior that comparisons between the conditions were made based on relatively few data points. Particularly, comparisons of compliance with the TO demand (Study 1) and problem behavior in TO (Study 2) could only occur when subjects were sent to TO, but TO was so effective that subjects were sent to TO rarely.

Although the time-in environment was designed to be enriched with many potential reinforcers, no systematic evaluation of which items or activities in time-in would actually function as reinforcers was conducted. Also, the schedule of reinforcement for appropriate behavior during time-in is unknown. Peers may not always agree to play with the subjects, even when they were engaging in appropriate play initiation behavior. The extent to which time-in was reinforcing did not appear to affect the results of these studies, but would be important to consider and directly manipulate in future studies. Future research should determine how reinforcing (i.e., the schedule of reinforcement and quality and variety of reinforcers available) the time-in environment has to be for TO to be effective. TO is not typically recommended for problem behavior that is or is likely to be maintained by escape from demands, but TO could potentially be effective if the time-in with demands is less aversive (or more reinforcing) than the barren TO environment. Future research should evaluate the effectiveness of TO in the context of behavioral function and schedule of reinforcement during time-in.

Additionally, future research should examine ways to reduce or eliminate problem behavior in TO. Problem behavior in TO makes TO implementation aversive for the adult/therapist and thus may make parents and teachers less likely to select TO as a treatment, despite its general effectiveness. The release contingency procedure that is commonly recommended, and was evaluated in Study 2, did not reduce problem behavior in TO. However, a procedure similar to the 1- or 4-min TO used in Study 1 may be more effective at reducing problem behavior in TO. Instead of providing a 1-min TO contingent on compliance with the TO demand, a 1-min TO could be provided contingent on sitting calmly and engaging in no problem behavior during the first min of TO. If problem behavior occurs during the first min of TO, the child has to stay in TO for 4 min. Study 2 found that escape from TO following a fixed-duration TO did not adventitiously reinforce problem behavior in TO and did not result in problem behavior immediately following TO, so future procedures designed to reduce problem behavior in TO do not need to ensure that problem behavior does not occur at the end of the TO interval.

Based on the findings of these studies, several recommendations about how to implement TO with young children can be made. First, brief, contingent observation TO should be considered as a treatment for the problem behavior of young children during times in which many potential reinforcers are available (e.g., recess, free play time). Based on Gary's results during the 1-min TO, a 1-min TO without the possibility of serving a longer TO may not be effective at consistently maintaining low levels of problem behavior. For all subjects, 3-min (Damien and Keenan) or 4-min (Adam, Ricky, Austin, Brandon, Stevie, Gary, Harold, Jackson, and Forrest) TO durations were effective at suppressing problem behavior. Study 1 demonstrated a simple way to increase compliance with the TO demand and reduce implementation effort. Parents and teachers should consider providing a reduced TO duration contingent on compliance

with the TO demand in the form of 1-min TO for compliance and a 4-min TO for noncompliance. Additionally, parents and teachers should release children from TO when the previously selected duration elapses. Study 2 found that release contingencies at the end of the TO interval did not reduce problem behavior in TO or make it less likely that problem behavior will occur immediately following TO; release contingencies only served to prolong the TO interval. Study 3 suggested that warnings may interrupt ongoing problem behavior in some children, but will not reduce problem behavior to acceptable levels without being used in combination with TO. Warnings were also not necessary to maintain acceptably low levels of problem behavior during dense schedules of intermittent TO, but did not produce a reinforcement effect either. Thus, warnings, as they are typically used, should not necessarily be recommended but are not harmful to the efficacy of TO if TO is implemented at least half of the time

REFERENCE LIST

- Baer, D. M. (1962). Laboratory control of thumbsucking by withdrawal and re-presentation of reinforcement. *Journal of the Experimental Analysis of Behavior*, 5, 525-528.
- Barton, L. E., Brulle, A. R., & Repp, A. C. (1987). Effects of differential scheduling of time-out to reduce maladaptive responding. *Exceptional Children*, 53, 351-356.
- Bean, A. W., & Roberts, M. W. (1981). The effect of time-out release contingencies on changes in child noncompliance. *Journal of Abnormal Child Psychology*, 9, 95-105.
- Benjamin, R., Mazzarins, H., & Kupfersmid, J. (1983). The effect of time-out (TO) duration on assaultiveness in psychiatrically hospitalized children. *Aggressive Behavior*, 9, 21-27.
- Bostow, D. E., & Bailey, J. (1969). Modification of severe disruptive and aggressive behavior using brief timeout and reinforcement procedures. *Journal of Applied Behavior Analysis*, 2, 31-37.
- Brantner, J. P., & Doherty, M. A. (1983). A review of timeout: A conceptual and methodological analysis. In S. Axelrod & J. Apsche (Eds.), *The effects of punishment on human behavior* (pp. 87-132). New York: Academic Press, Inc.
- Burchard, J. D., & Barrera, F. (1972). An analysis of timeout and response cost in a programmed environment. *Journal of Applied Behavior Analysis*, 5, 271-282.
- Calhoun, K. S., & Lima, P. P. (1977). Effects of varying schedules of time-out on high- and low-rate behaviors. *Journal of Behavior Therapy and Experimental Psychiatry*, 8, 189-194.
- Calhoun, K. S., & Matherne, P. (1975). The effects of varying schedules of time-out on aggressive behavior of a retarded girl. *Journal of Behavior Therapy and Experimental Psychiatry*, 6, 139-143.
- Clark, H. B., Rowbury, T., Baer, A. M., & Baer, D. M. (1973). Timeout as a punishing stimulus in continuous and intermittent schedules. *Journal of Applied Behavior Analysis*, 6, 443-455.
- Cooper, J. O., Heron, T. E., & Heward, W. L. (2006). *Applied Behavior Analysis* (2nd ed.). Upper Saddle River: Pearson Prentice Hall.
- Dorsey, M. F., Iwata, B. A., Ong, P., & McSween, T. E. (1980). Treatment of self-injurious behavior using a water mist: Initial response suppression and generalization. *Journal of Applied Behavior Analysis*, 13, 343-353.
- Erford, B. T. (1999). A modified time-out procedure for children with noncompliant or defiant behaviors. *Professional School Counseling*, 2, 205-210.

- Fleece, L., O'Brien, T., & Drabman, R. (1981). The use of a contingent observation procedure to reduce disruptive behavior in a preschool child. *Journal of Clinical Child Psychology, 10*, 128-130.
- Foxx, R. M., & Azrin, N. H. (1973). The elimination of autistic self-stimulatory behavior by overcorrection. *Journal of Applied Behavior Analysis, 6*, 1-14.
- Haynes, S. N., & Geddy, P. (1973). Suppression of psychotic hallucinations through time-out. *Behavior Therapy, 4*, 123-127.
- Hobbs, S. A., Walle, D. L., & Caldwell, H. S. (1984). Maternal evaluation of social reinforcement and time-out: Effects of brief parent training. *Journal of Consulting and Clinical Psychology, 52*, 135-136.
- Hobbs, S. A., & Forehand, R. (1975). Effects of differential release from time-out on children's deviant behavior. *Journal of Behavior Therapy and Experimental Psychiatry, 6*, 256-257.
- Hobbs, S. A., Forehand, R., & Murray, R. G. (1978). Effects of various durations of timeout on the noncompliant behavior of children. *Behavior Therapy, 9*, 652-656.
- Iwata, B. A., Rolider, N. U., & Dozier, C. L. (2009). Evaluation of timeout programs through phased withdrawal. *Journal of Applied Research in Intellectual Disabilities, 22*, 203-209.
- James, J., E. (1976). The influence of duration on the effects of time-out from speaking. *Journal of Speech and Hearing Research, 209*, 206-215.
- Kendall, P. C, Nay, W. R, Jeffers, J. (1975). Timeout duration and contrast effects: a systematic evaluation of a successive treatments design. *Behavior Therapy, 6*, 609-615.
- Lerman, D. C., Iwata, B. A., Shore, B. A., & DeLeon, I. G. (1997). Effects of intermittent punishment on self-injurious behavior: An evaluation of schedule thinning. *Journal of Applied Behavior Analysis, 30*, 187-201.
- Lerman, D. C., & Vorndran, C. M. (2002). On the status of knowledge for using punishment: Implications for treating behavior disorders. *Journal of Applied Behavior Analysis, 35*, 431-464.
- Luiselli, J. K., Pace, G. M., & Dunn, E. K. (2006). Effects of behavior-contingent and fixed-time release contingencies on frequency and duration of therapeutic restraint. *Behavior Modification, 30*, 442-455.
- MacDonough, T. S., & Forehand, R. (1973). Response-contingent time out: Important parameters in behavior modification with children. *Journal of Behavior Therapy and Experimental Psychiatry, 4*, 231-236.

- Mace, F. C., & Heller, M. (1990). A comparison of exclusion time-out and contingent observation for reducing severe disruptive behavior in a 7-year-old boy. *Child & Family Behavior Therapy, 12*, 57-68.
- Mace, F. C., Page, T. J., Ivancic, M. T., & O'Brien, S. (1986). Effectiveness of brief time-out with and without contingent delay: A comparative analysis. *Journal of Applied Behavior Analysis, 19*, 79-86.
- McGuffin, P. W. (1991). The effect of timeout duration on frequency of aggression in hospitalized children with conduct disorders. *Behavioral Residential Treatment, 6*, 279-288.
- Miltenberger, R. G. (2007). *Behavior Modification Principles and Procedures* (4th ed.). Belmont, CA: Wadsworth.
- O'Brien, F., & Azrin, N. H. (1972). Developing proper mealtime behaviors of the institutionalized retarded. *Journal of Applied Behavior Analysis, 19*, 241-254.
- Pendergrass, V. E. (1971). Effects of length of time-out from positive reinforcement and schedule of application in suppression of aggressive behavior. *The Psychological Record, 21*, 75-80.
- Phillips, E. L., Phillips, E. A., Fixsen, D. L., & Wolf, M. M. (1971). Achievement Place: Modification of the behaviors of pre-delinquent boys within a token economy. *Journal of Applied Behavior Analysis, 4*, 45-59.
- Pierce, C. H., & Risley, T. R. (1974). Recreation as a reinforcer: increasing membership and decreasing disruptions in an urban recreation center. *Journal of Applied Behavior Analysis, 7*, 403-411.
- Porterfield, J. K., Herbert-Jackson, E., & Risley, T. R. (1976). Contingent observation: An effective and acceptable procedure for reducing disruptive behavior of young children in a group setting. *Journal of Applied Behavior Analysis, 9*, 55-64.
- Reitman, D., & Drabman, R. S., (1996). Read my fingertips: A procedure for enhancing the effectiveness of time-out with argumentative children. *Child & Family Behavior Therapy, 18*(2), 35-40.
- Ricochet Entertainment, Shed Media USA (Producers). (2004-present). Super Nanny [television series]. abc.
- Roberts, M. W. (1982). The effects of warned versus unwarned timeout procedures on child noncompliance. *Child & Family Behavior Therapy, 4*, 37-53.
- Roberts, M. W., & Powers, S. W. (1990). Adjusting chair timeout enforcement procedures for oppositional children. *Behavior Therapy, 21*, 257-271.

- Scarboro, M. E. & Forehand, R. (1975). Effects of two types of response-contingent time-out on compliance and oppositional behavior of children. *Journal of Experimental Child Psychology, 19*, 252-264.
- Skinner, B. F. (1948) Superstition in the pigeon. *Journal of Experimental Psychology, 38*, 168-172.
- Solnick, J. V., Rincover, A., & Peterson, C. R. (1977). Some determinants of the reinforcing and punishing effects of timeout. *Journal of Applied Behavior Analysis, 10*, 415-424.
- Twyman, J. S., Johnson, H., Buie, J. D., & Nelson, C. M. (1994). The use of a warning procedure to signal a more intrusive timeout contingency. *Behavioral Disorders, 19*, 243-253.
- Vollmer, T. R, Borrero, J. C., Wright, C. S., Van Camp, C., & Lalli, J. S. (2001). Identifying possible contingencies during descriptive analyses of severe behavior disorders. *Journal of Applied Behavior Analysis, 34*, 269-287.
- Warzak, W. J., & Floress, M. T. (2009). Time-out training without put-backs, spanks, or restraint: A brief report on deferred time-out. *Child & Family Behavior Therapy, 31*, 134-143.
- Wasik, B. H., Senn, K., Welch, R. H., & Cooper, B. R. (1969). Behavior modification with culturally deprived school children: Two case studies. *Journal of Applied Behavior Analysis, 2*, 181-194.
- White, A. G., & Bailey, J. S. (1990). Reducing disruptive behaviors of elementary physical education students with sit and watch. *Journal of Applied Behavior Analysis, 23*, 353-359.
- White, G. D., Nielsen, G., & Johnson, S. M. (1972). Timeout duration and the suppression of deviant behavior in children. *Journal of Applied Behavior Analysis, 5*, 111-120.
- Wolf, M. M., Risley, T., & Mees, H. (1964). Application of operant conditioning procedures to the behaviour problems of an autistic child. *Behaviour Research and Therapy, 1*, 305-312.
- Zabel, M.K. (1986). Timeout use with behaviorally disordered students. *Behavioral Disorders, 12*, 15-21.

BIOGRAPHICAL SKETCH

Jeanne Donaldson was born in Melbourne, FL in 1985. She moved to Atlanta to attend Emory University in 2003 and, in 2005, transferred to the University of Florida, where she earned her bachelors of science in psychology in 2006. Jeanne moved back to Melbourne, FL to pursue a Master of Science in Applied Behavior Analysis at the Florida Institute of Technology. While obtaining her master's degree, Jeanne worked under the supervision of Drs. Matt Normand and Pam Neidert. During that time she was awarded the B. F. Skinner Foundation Scholarship for her thesis work on increasing physical activity in overweight and obese adults, which was published in *Behavioral Interventions* (Donaldson & Normand, 2009). Jeanne was also awarded Outstanding Student of the Year in Applied Behavior Analysis at the Florida Institute of Technology for the 2006-2007 academic year.

Jeanne returned to Gainesville, FL and the University of Florida in 2008 to enter the doctoral program in psychology under the mentorship of Dr. Tim Vollmer. During her time in the doctoral program, Jeanne served as a behavioral consultant for a school district in Iowa with Dr. Vollmer and several of other doctoral students. Some of her work in Iowa was published in the *Journal of Applied Behavior Analysis* (Donaldson, Vollmer, Krous, Downs, & Berard, 2011). Upon completion of her Doctor of Philosophy in December 2011, Jeanne will begin as a postdoctoral fellow at the Kennedy Krieger Institute at Johns Hopkins University Medical School under the mentorship of Dr. SungWoo Kahng.