

EFFECTIVENESS OF BRIEF TIME-OUT WITH AND WITHOUT CONTINGENT DELAY: A COMPARATIVE ANALYSIS

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We evaluated a commonly used component of brief time-out, in which release from time-out is delayed contingent on the occurrence of disruption. Data were collected for one normal and two mentally retarded children on time-out-producing behaviors (aggression and disruption) as well as delay-producing behaviors during time-out (loud vocalizations, out-of-chair, aggression, and disruption). The results of a combination ABAC reversal and multiple-baseline design indicated that, under the conditions used in this investigation, both delay and no delay variations were effective in reducing the frequency of the target behaviors. Implications for the use of time-out to reduce aberrant behaviors are discussed.

DESCRIPTORS: time-out, disruptive behavior, contingent delay, aggressive behavior, retarded children

Several studies have evaluated the effects of various procedural components of time-out (TO) from reinforcement. One parameter of TO yet to be fully analyzed is the use of a contingent delay. A common component of TO procedures, contingent delay is defined as an extension of the TO interval for a specified period of time contingent on the occurrence of aberrant behavior during TO (Bostow & Bailey, 1969). In the only evaluation of contingent delay to date, Hobbs and Forehand (1975) compared TO with delay to TO without delay in a program for noncompliance. Time-out with contingent delay was associated with fewer aberrant behaviors during TO and greater reductions in noncompliance.

A number of potential liabilities associated with the use of contingent delay suggest that further investigation is warranted: (a) highly resistant individuals may be retained in TO for durations well beyond those necessary for effectiveness (Hobbs, Forehand, & Murray, 1978), not only taxing staff time, but limiting a client's opportunity for rein-

forcement of positive behaviors; (b) contingent delay, as generally used, requires that clients be retained in TO for minor offenses such as crying and out-of-seat behavior that ordinarily would not result in TO; and (c) contingent delay requires relatively more staff training and supervision to ensure accurate application of the delay.

We designed this investigation to evaluate the possible therapeutic effects of contingent delay as a component of TO procedures for the reduction of aggression and disruption. Chair TO procedures both *with* and *without* a contingent delay were compared on the basis of their effects on (a) target behaviors that result in TO and (b) behaviors during TO that result in an extension of the TO interval.

METHOD

Subjects and Settings

Three children with severe behavior disorders who had been admitted to an inpatient pediatric hospital for the developmentally disabled served as participants. Amy, age 3, tested as mildly mentally retarded but had only a 2-3 word vocabulary. Sam was a 4-year-old boy functioning in the low average IQ range with good language skills. Art, age 15, functioned in the severe-profound range

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of mental retardation with language limited to 2–3 word imitative phrases.

Baseline observations and treatment were conducted in a 3 m × 3 m training room containing a table, chairs and, in some cases, a variety of toys. The training room was adjoined to a 3.0 m × 1.5 m observation room with a one-way mirror. Sessions for Amy and Art were also conducted in a 9 m × 5 m activity room equipped with a variety of educational and recreational materials.

Observation Procedures

Time-out-producing behaviors. Target behaviors were responses contingent on which TO would be implemented. *Aggression* was defined as hitting, kicking, biting, scratching, or throwing an object that struck someone. *Disruption* was scored for each occurrence of throwing objects, climbing on furniture, licking windows, repetitive jumping, loud vocalizations, spitting, knocking down furniture, damaging objects, leaning on others, touching others' faces, pulling others' shoe laces, undressing, and urinating in one's clothes. For all subjects, data on disruption were collected using a continuous 10-s partial-interval procedure during 15-min sessions. Data on Amy's aggression were collected continuously while she was in the activity room.

Delay-producing behaviors. Four behaviors were selected that, if emitted by any subject during the final 15 s of a 2-min TO period, would result in extension of the TO interval. *Loud vocalizations* were defined as crying, screaming, or whining. *Out-of-chair* was scored each time the subject raised both buttocks off the seat of the TO chair. *Aggression* referred to occurrences of hitting, kicking, biting, scratching, or obvious attempts to do so. *Disruption* was defined as spitting, tearing clothing, moving the TO chair, and kicking or hitting walls. Delay-producing behaviors were recorded during each TO interval using 10-s partial-interval recording. An exception was made for Amy's aggression in the activity room because it was not feasible to collect data on each incident of TO throughout the day.

Time-out integrity measures. Several measures

were taken to assess the procedural and functional integrity of the TO procedures. The procedural integrity of time-out was defined as the extent to which the following four procedures were executed during each TO episode: (a) subject stays in chair, (b) subject faces corner, (c) therapist removes play materials from the TO area, and (d) the therapist does not talk. The functional integrity of time-out was measured by stopwatch as the latency to leave the TO chair when allowed to do so at the end of the interval. If being out of the TO chair was more reinforcing than being on the chair, latency to leaving the chair was expected to be short. The procedural integrity of the contingent delay was also evaluated. This was defined as the duration of the TO interval following the last delay-producing behavior occurring at or after the 1 min 45 s mark of the 2-min TO period. Delays of 15 s ± 3 s as measured by stopwatch were considered acceptable.

Interobserver agreement. All dependent variables were recorded independently by two observers during a minimum of 30% of the sessions during each experimental phase. Total, occurrence, and nonoccurrence percent agreement were calculated on an interval-by-interval basis. The mean total, occurrence, and nonoccurrence percent agreements were 97%, 80%, and 97%, respectively, for TO-producing behaviors, and 92%, 78%, and 92%, respectively, for delay-producing behaviors. Agreement on TO integrity measures occurred on 49% of the TO episodes, with a minimum of 32% during each experimental phase in which TO was used. By considering each TO episode as an interval, agreement was calculated on an interval-by-interval basis for total, occurrence, and nonoccurrence measures, and averaged 99%, 86%, and 99%, respectively.

Procedures

Baseline. Based on parent reports and informal observation, the disruptive behavior of all three subjects appeared to be a function of contingent social disapproval. Therefore, during baseline sessions, the therapist provided disapproving statements contingent on aberrant responses in an at-

tempt to approximate contingencies in the home environment. The experimenter provided approval statements for appropriate behavior for all clients in the training room setting on a VI 5-min schedule. For Amy, enthusiastic praise was provided by staff contingent on appropriate behavior in the activity room on a VI 2-min schedule. In addition, stimulus characteristics of the settings were varied to enhance subjects' ability to discriminate between treatment conditions. Among the characteristics varied were training room vs. activity room, toys vs. no toys, and one adult reading vs. two adults conversing. With Amy and Sam some sessions were conducted by their mothers. The following baseline conditions resulted.

1. *Social disapproval without toys*: A therapist was seated reading a magazine in the training room and the subject was free to move about the room. Eye contact and verbal statements by the therapist were kept to a minimum. Disapproving comments were provided contingent on and immediately following disruptive behavior on a VR 2 schedule. No toys or other persons were present in the room.

2. *Social disapproval with toys*: Conditions identical to those described above were in effect. The only exception was that several age-appropriate toys were available in the room.

3. *Social disapproval—adults conversing*: The above conditions were held constant with one exception. Two adults (mother and father or mother and therapist) were engaged in casual conversation. Apart from contingent social disapproval, interaction between adults and Sam was minimal.

4. *Activity room*: In the activity room, designed to simulate a preschool setting, there were usually 1–5 pediatric patients and 2–5 staff members engaged in various individual and group activities. Amy participated in the normal routine and was provided social disapproval contingent on aggression on a VR 3 schedule.

Time-out without contingent delay. During this phase, the above baseline procedures were maintained with one exception. A standard chair TO procedure was implemented by the therapist or parent contingent on the occurrence of any TO-

producing behavior, according to the following procedure: (a) Immediately following the occurrence of a target behavior, the therapist said "No" (name of the target response). "Go to time-out." (b) The therapist led the child by the arm to a prepositioned TO chair and seated him or her facing the corner. (c) All toys, magazines, and furniture were moved beyond the child's reach. (d) The therapist stood directly behind the chair and did not talk or make eye contact during the TO interval. (e) If the buttocks were raised from the TO chair or the child's head turned more than 45° from the corner, the therapist used the least amount of force necessary to guide compliance with the TO procedure. (f) At the end of 2 min, the therapist turned the TO chair 45° from the corner and walked away, occasioning the end of the TO interval. No instructions to leave the TO chair were provided.

Time-out with contingent delay. The TO procedure described above was implemented during this phase with one difference. Instead of terminating TO after 2 min, the TO interval was extended by 15 s from the last "delay-producing" behavior occurring after 1 min 45 s of TO.

Experimental Design

We used a combination of design elements to evaluate the relative effects of TO with and without a contingent delay. For all subjects, an ABAC reversal design was combined with a multiple-baseline design across conditions. The sequence of delay and no-delay treatments was counterbalanced across subjects and across conditions within each subject. Additionally, the generality of effects under parent-run sessions was assessed with Amy and Sam.

RESULTS

Figure 1 shows data on aberrant TO-producing behaviors for all three subjects plotted across baseline, TO with delay, and TO without delay conditions. Each subject exhibited substantial levels of inappropriate behaviors during the initial baselines. Time-out with delay and TO without delay were

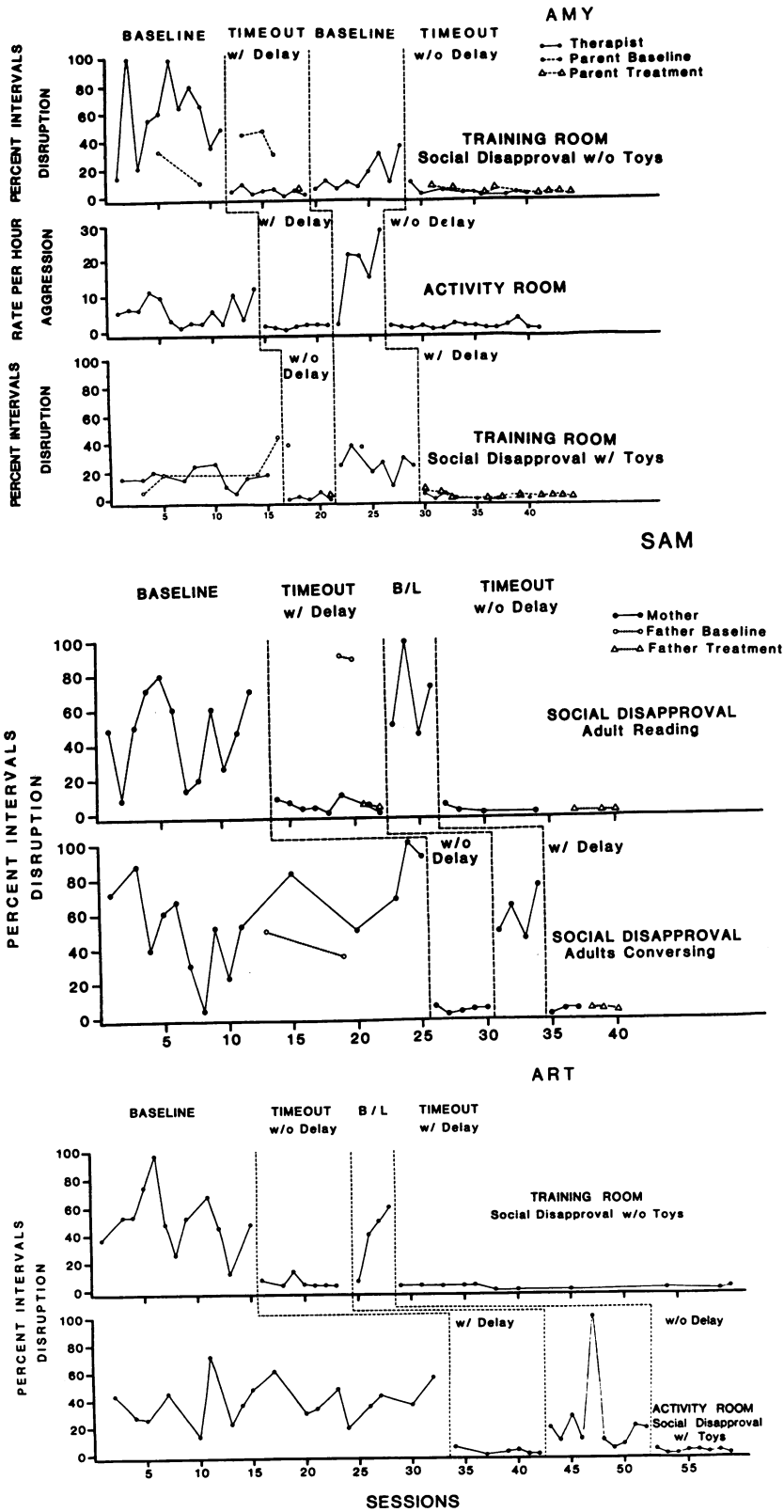


Figure 1. Percent intervals of TO-producing behaviors plotted across baseline, TO with delay, and TO without delay conditions.

both effective in reducing the aberrant behaviors to near zero. Reinstitution of baseline conditions resulted in behaviors returning to or approximating baseline levels. When time-out procedures were again implemented they were effective in virtually eliminating the behaviors. With each subject, the sequence was replicated across one or more additional baselines.

Figure 2 shows the percent intervals in which delay-producing behaviors occurred during TO episodes with and without delay. With Amy, delay-producing behaviors occurred more frequently when contingent delay was in effect than when delay was not in effect: 37% vs. 26% and 47% vs. 32%. This was also true for Sam with the data shown in his top graph (61% vs. 43%), although delay and no delay had similar effects in the adults conversing condition (45% vs. 49%). Likewise, Art showed discrepant effects, with more delay-producing behaviors in the no-delay condition in the training room (12% vs. 45%), and identical means in the activity room (36% vs. 36%).

A major rationale for the use of TO with a contingent delay is that it will teach clients that escape from TO is not contingent on misbehavior. A pattern consistent with this hypothesis would be a gradual decrease in the duration of TO episodes over time as subjects learn this contingency (i.e., an extinction curve). The data shown in Figure 3 address this issue by presenting the duration in minutes of TO episodes where a contingent delay was in effect. With the possible exception of Sam's social disapproval-adults conversing condition, minutes spent in TO with delay did not show extinction patterns across subjects and conditions.

Measures of the percentage of TO episodes with delay-producing behaviors in the final 15 s were calculated to compare the extent to which subjects contacted the delay and no-delay contingencies. Respective means for delay and no-delay were 39% and 20% for Amy, 64% and 44% for Sam, and 38% and 61% for Art.

Data collected on the integrity of TO indicated consistent application of specified procedures. The mean percent occurrence of each of the procedural integrity measures of TO were 97.7% for subject in chair, 99.3% for subject facing corner, 98.0%

for materials removed, and 97.3% for no therapist/parent talk. The estimate of functional integrity of TO—latency of less than 2 s to leave the TO area when allowed—occurred an average of 94.4% of the TO episodes. Finally, duration measures of the contingent delay procedure all fell within $15 \text{ s} \pm 3 \text{ s}$.

DISCUSSION

We compared the effects of a chair TO procedure with and without a contingent delay component. The two TO methods consistently reduced targeted aberrant behaviors to comparable levels, and no consistent differences were found in aberrant responses occurring during TO intervals. There was some evidence that subjects exposed to delay conditions learned to sit quietly during the latter portion of the TO interval, thereby avoiding an extension of TO. Data patterns noted earlier were consistent across three subjects at different ages and IQ levels, and with parents as well as experimenters serving as therapists, thereby strengthening the generality of the findings. Confidence in these results is further enhanced by the inclusion of detailed measures demonstrating the integrity of the independent variable.

The outcome of this study has a number of implications for the use of TO in applied settings. First, results are at variance with accepted standards for TO practice (Hobbs & Forehand, 1975). The commonly used contingent delay procedure was not found to enhance TO efficacy or ease of implementation. Thus, results suggest that adventitious reinforcement is unlikely to occur under the present circumstances.

A second consideration is the relative practicality of the two variations of TO. Time-out with no delay places fewer demands on parent/teacher/staff time and results in less disruption of regular activities. The data suggest that there is little benefit in setting up what may result in a control-countercontrol struggle between the child and caretaker.

A third issue is one of an ethical nature. Because the use of a delay component can extend TO beyond its effectiveness threshold (Hobbs et al.,

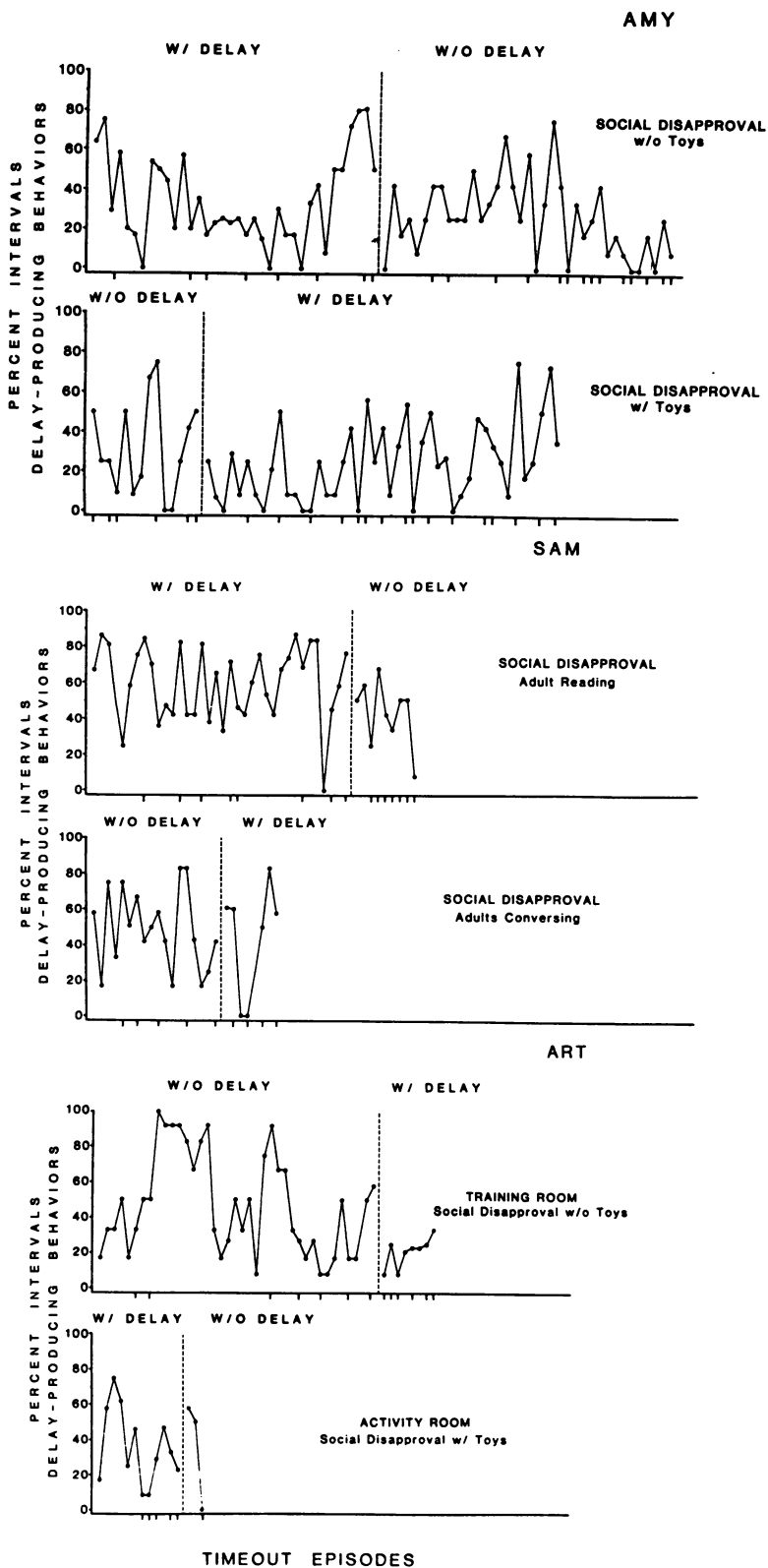


Figure 2. Percent intervals of delay-producing behaviors during TO episodes with and without delay components.

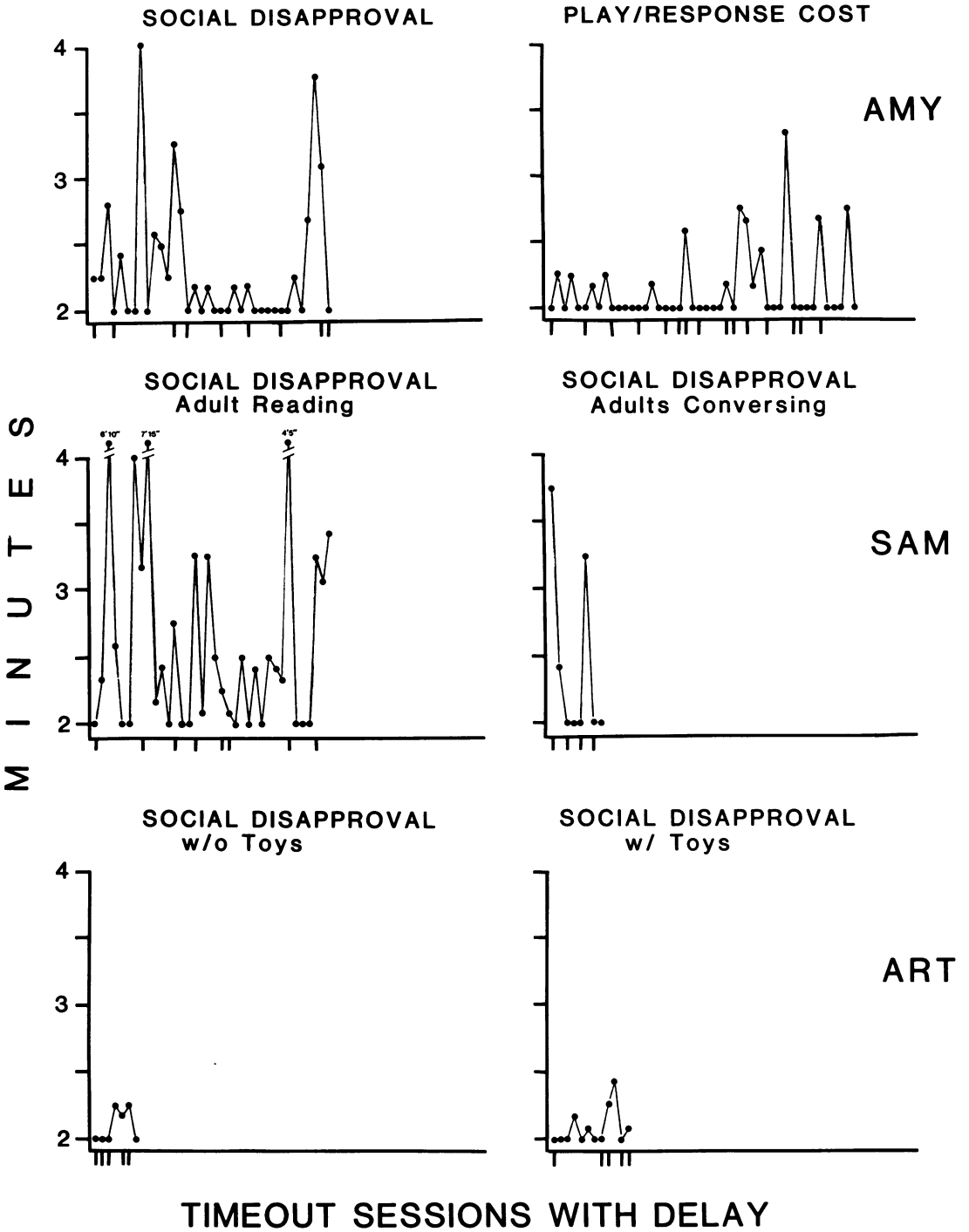


Figure 3. Duration in minutes of TO episodes in which a delay component was in effect.

1978), and may require clients to be maintained in TO contingent on responses that would not normally result in TO, its use should be empirically justified. In view of the growing concern about the use of aversive procedures and TO in particular (Foxy & Shapiro, 1978; Porterfield, Herbert-Jackson, & Risley, 1976), the potential liabilities associated with the contingent delay deserve careful consideration.

Several aspects of this study may limit the generality of the reported findings and deserve mention. First, although subjects varied in terms of age and IQ, their functional skills did not exceed those of a normal preschool child. It remains to be seen whether the results obtained are generalized to individuals with different overall skill levels. Second, it is possible that contingent social disapproval may have inflated baseline levels of aberrant behavior, and that merely withdrawing social disapproval (with the introduction of a DRO component) would have made TO unnecessary. However, contingent social disapproval has been used effectively in the assessment of other severe behaviors such as self-injury (Iwata, Dorsey, Slifer, Bauman, & Richman, 1982), and baseline observations here were consistent with reported preadmission levels and patterns of parent-child interactions. Third, beyond the usual limits to external validity, the findings presented here may be subject to floor effects. Because both TO procedures were highly effective in reducing aberrant target behaviors, there was little room for one procedure to appear more effective than the other. Fourth, because the percentage of TO episodes with delay-producing behaviors averaged only 44% across subjects, it is possible that subjects' intermittent contact with the different TO conditions made the conditions functionally equivalent. This may be an artifact of this

type of research that might benefit from further investigation.

Before firm conclusions regarding the therapeutic benefit of contingent delay are possible, replication studies such as those implied earlier are needed. However, one suggestion for TO practice may be offered based on this investigation. The data suggest that at least under some conditions TO programs could be developed without a contingent delay component, especially when used with retarded or preschool populations. Should aberrant behaviors increase during or outside of TO occasions, a procedure may be developed to assist the client in discriminating between true and superstitious contingencies.

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