

Brief report: Application of Proposed Model of Decreasing Reinforcement Intensity

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LaBlanc, Hagopian, Malieri, and Poling (2002) proposed a model for decreasing reinforcement intensity in clinical practice. This paper applies that model to the fading of a point system for a nine-year-old boy who displayed escape behavior around nightly homework assignments. Using a hanging criterion design, the author was able to track the changes in reinforcement density. This fading model produced rapid gains in the child's progress and the child moved quickly to a less restrictive form of intervention.

Keywords: Token economies, fading, intermittent reinforcement, changing criterion designs.

The combination of token reinforcement (Wolery, Bailey, & Sugai, 1988) and response cost (Witt & Elliot, 1982) combined with soft reprimands (O'Leary, Kaufman, Kass, & Drabman, 1970; Pffiffer & O'Leary, 1987; Van Houten, Makenzie-Keating, Sameoto, & Coleavecchia, 1982) is highly effective in reducing behavior problems. In spite of the effectiveness of contingency management procedures, little research exists on methods to fade out such systems (see LaBlanc, Hagopian, Maglieri, & Poling, 2002). LaBlanc and colleagues (2002) proposed a model for fading out the intensity of reinforcement procedures. They state that (1) begin intensive; (2) increasing amount of behavior needed for reinforcers; (3) determine a reasonable terminal goal based on the age and functioning level of the participant; (4) establish a series of values or steps between the initial level and the proposed terminal level (33% to 50% a good range); (5) allow sufficient exposure to the current level of reinforcement before inflating the system; and (6) progress as quickly as possible to the final intervention level by using period probes to determine how quickly the intensity of the fading procedure can advance.

One method that would meet the above characteristics would be if the program has variability in the behavior rates calculating the mean behavior rate and setting earning of the reinforcer at the mean level + 33% of the mean level. The author attempted to test this with a child who was on a complex token system involving the earning of points and both the loss of points for misbehavior and soft reprimands.

Method

Participant

Participant was a nine-year-old boy, who attended a suburban school. Through his entire school career, the parent reported the participant was generally an A and B student in school. He appeared to have no classroom difficulty, with the exception of occasional report card comments about participant not following directions in class and incomplete work assignments.

Setting

The settings where the intervention took place in the child's home at the kitchen table where the child was to complete homework assignments. The participant was to start promptly on coming home from school approximately 3:30 p.m. and would continue until 5:30 p.m. No other children were in the home.

Behavior/ Function

The participant pouted, whined, became defiant, or tantrum (throw self on floor and crying and kicking) from 14x/week at home around homework context. The author assessed the function of these behaviors through a descriptive analysis, which involved the following steps: (1) interview of the parent (2) direct observation in both the home using an ABC-event recording procedure. The antecedent was always the parent telling the child to begin homework. Interviews suggested that the function was either escape or attention based. The observations revealed that the participant had a high probability of all four behaviors just after receiving the start command for homework (100%) of the time as opposed to low probability (0%) when the parent gave no commands. In addition, whether the parent at with the child to do the homework or went to the stove to cook did not appear to matter with respects to pleading to not start homework. The author concluded that the behavior was most likely escape behavior from homework assignments. While the escape class of behavior (consisting of the above defined behavior) led to momentary escape, parent kept child at table until all work was completed. Curriculum based measurement (Tindal & Marston, 1990) of participants' math and reading ability revealed that the child was instructional at his grade level (4th grade).

Procedure

The intervention was a standard token system combined with response cost and soft reprimands. The participant earned points as follows: 2 point for immediately starting tasks when asked without complaints; 1 point for each five minutes on the task; 3 points for each task completed; and 4 points for tasks completed correctly. Participant would loose points for whining (-2 pts), pleading (-4 pts), defiant statements (-4 points) and tantrum behavior (-7 pts). Participant could earn approximately a total of 56 points. Prizes to be awarded on the token system were (1) picking the family activity(initial point cost 22) (2) dessert (pie, ice cream, or cookies) (initial point cost 24) (3) picking the 8-9 pm television show for the family (initial point cost 26) and (4) staying up half an hour later until 9:30 p.m. (initial point cost 28). In each subphase of the program, the ratio of points between items remained the same. The intervention took place Monday through Thursday because child had no homework do on Friday or Monday morning. After day six, the decision for change level was three successive days above the reinforcement minimum level. Each successive increase was mean rate of points from previous level. The new level for lowest reinforcement was based the mean of the previous level of reinforcement + 33% increase (*See table 1*).

Table 1- Subphases of intervention

Phase	Mean number of points earned in previous subphase	Fading factor added	Total points needed to make minimum reward
Phase I	N/a	N/a	22
Phase II	26	8	34

Phase III	31	10	41
Phase IV	41	13	54
Phase V	51	16	67

As a way of moving to a molar system, the parent allowed the participant to make a choice to save points each day. In each subphase, the parent allowed the participant to save points. In subphase one, the parent allowed the participant to save as many as 5-points each day. In subphase two, the parent allowed the participant to save as many as 9 points each day. In subphase three, the parent allowed the child to save as many as 12 points/day. In subphase four, the parent allowed the participant to save as many as 15 points. In subphase five, the parent allowed the participant to save as many as 17 points.

Inter-observer Agreement

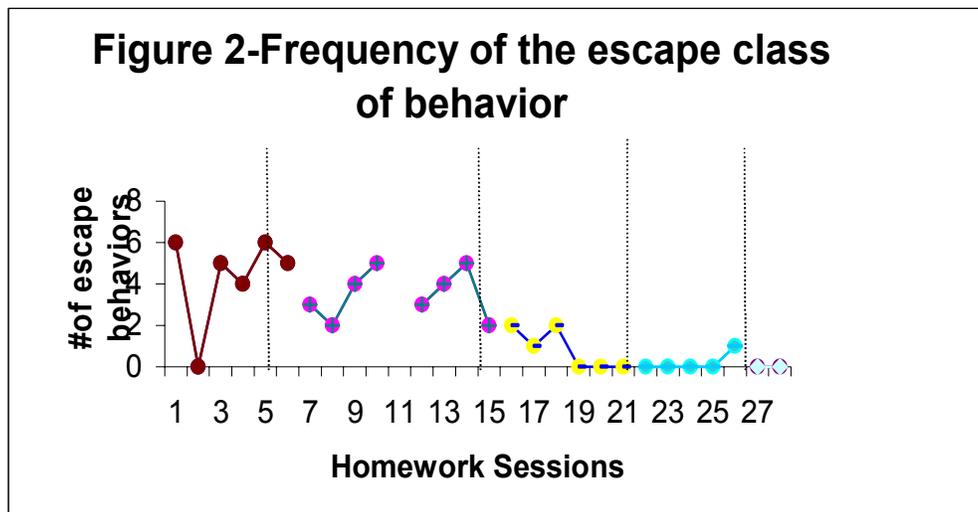
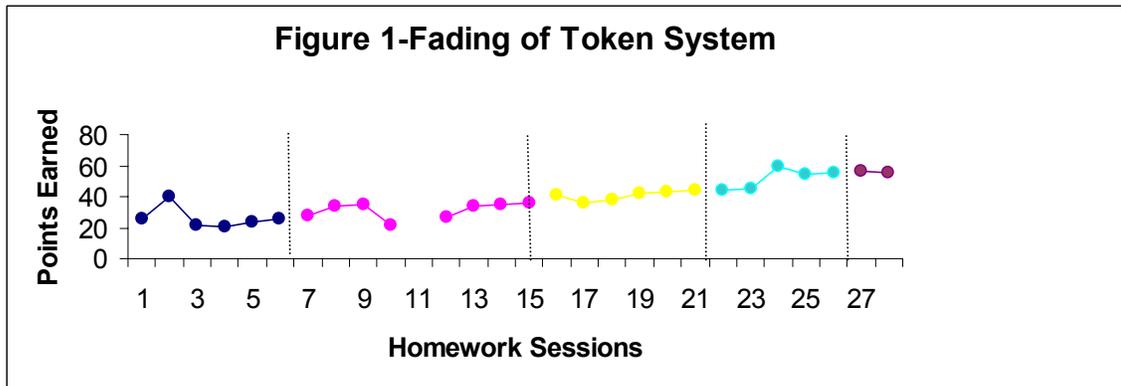
Hawkins and Fabry (1979) stressed the importance of ensuring inter-observer agreement in data collection. The author looked at incidents where the participant earned points for his behavior. He observed if his points earned and response costs given matched what the parent recorded. Of the twenty behavioral incidents compared, the parents coding of what occurred matched the authors on 19 out of 20 occasions. Using the equation of $\text{agreements} / \text{agreements} + \text{non-agreements}$ multiplied by 100, to calculate the percent of agreement this resulted in a 95% agreement in the behavioral observation.

Treatment Integrity/ Procedural Reliability

Procedural reliability (Billingsley, White, & Munson, 1980; Salend, 1984a, b) is the process of looking to see if the intervener is executing the treatment procedure as planned. The author observed the treatment on three different occasions in the home to insure that the parent was conducting the token system and inflating it correctly. On each occasion, the treatment was as stated in the procedure section above. The author would write if he believed it represented a category deserving points, response cost or reprimand on an index card, the author compared this to what he had written to the parents stated position, and percentage of agreement was calculated. Of the twenty behavioral incidents compared only two incidents of behavior both involving response cost were recorded by the author as deserving response cost but it not being delivered. Using the equation of $\text{agreements} / \text{agreements} + \text{non-agreements}$ multiplied by 100, to calculate the percent of agreement. Thus, 90% agreement occurred between author and the parent as to treatment fidelity.

Design and Terminal goal

The author employed a changing criterion design. In a changing criterion design, the experimenter changes the criterion for reinforcement in a stepwise fashion. The design allows the author to determine a functional relationship by systematic replication across sub-phases toward a terminal goal. The terminal goal in this case was that the child would receive the maximum level of reinforcement possible for two consecutive sessions.



Results/Discussion

Table 1 indicates the number of tokens earned and how this affected future earning rates for rewards. Figure one, shows that in the first subphase no discernable trend was event in the data; however, an upward trend was evident in each of the successive subphases. Since by subphase 5 the participant met the terminal goal, the parent and the author redesigned the entire system redesigned to allow movement toward a more intermittent reward schedule. The new schedule continued to fade out the reward system over the next three months. A month after that point, an informal phone contact to follow- up with parent reported that she was requiring the participant to complete assignments. If he did so, then he would simply pick the dessert.

By subphase three, as indicated in Figure 2, the escape behavior was averaging less than one episode/session. This reduction had an additional positive effective in the duration of the overall homework sessions lessened. While not formally recorded, by week three the overall amount of time spent doing homework has decreased from two hours to approximately 95 minutes. In addition, quality of work improved and parent reported the participant was earning more points for completing tasks accurately.

Methods to enhance the effectiveness of standard treatment packages such as token economies are of significant importance to behavior analysts and behavioral psychologists as we attempt to develop next generation technology. One method that needs research is the use of functional assessment (Cautilli & Dzielowska, 2004). For example even in this study if the disruptive response class was attention-based behavior, then the author probably would not have used reprimands to reduce behavior. Another method is combining token systems with self-management programs (Zlomke & Zlomke, 2003). The most important area that needs exploration is how to fade token systems out in a rapid, efficacious, and efficient manner. The fading of token systems and other behavioral procedures can have profound impact on maintained of treatment gains (see Arnold et al. 2004). LaBlanc and colleagues (2002) model offers a good starting point for research. Future research should determine if rapid fading of systems is better than slower fading.

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