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## USE OF A TOKEN ECONOMY TO ELIMINATE EXCESSIVE INAPPROPRIATE SOCIAL BEHAVIOR IN AN ADULT WITH DEVELOPMENTAL DISABILITIES

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Adults with developmental disabilities frequently have both deficits in appropriate social skills and excesses in inappropriate social behavior (Matson, LeBlanc, & Weinheimer, 1999). Typically, published treatment studies have focused on social skills training procedures that teach and promote the use of new social behaviors. However, only a few studies have focused on management of existing social behaviors that are problematic because they occur excessively or in an inappropriate context (Wright, Herzog, & Seymour, 1992). The current study focuses on management of three types of inappropriate social behavior in a 26-year-old male with moderate mental retardation: inappropriate social interactions, inappropriate sexual behavior, and verbal aggression. A token economy with response cost procedure was implemented using a DRO interval as the basis for earning tokens. Using a multiple-baseline design across behaviors, each of the three types of inappropriate social behavior was successfully treated. After demonstrating the success of the procedure, the DRO interval was increased while maintaining the reductions in inappropriate social behaviors. Appropriate behaviors such as initiating conversation, shaking hands, etc maintained throughout the intervention. Copyright © 2000 John Wiley & Sons, Ltd.

Social relationships and social skills in adults with mental retardation have received more attention in the last several years because these adults increasingly live and work in community-based settings (Gumpel, 1994; Huang & Cuvo, 1997). Social interactions are complex and require sensitivity to social cues, knowledge of appropriate responses, and flexibility in responding to others by moderating the level of responding and identifying appropriate contexts for responding (Matson & Swiezy, 1994). Individuals with mental retardation may exhibit difficulties in social relationships related to each of these requirements. For example, individuals with more severe disabilities may lack even the most

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simple gestures and verbal skills. Practitioners can train these skills using basic behavioral principles, but other social difficulties may exist including inappropriate social behaviors such as aggression, screaming, and inappropriate sexual behavior (Garris & Hazinski, 1988; Wright *et al.*, 1992). Finally, individuals with mental retardation may exhibit appropriate social behavior such as shaking hands, initiating conversation, or hugging people at a rate which is excessive and therefore may be inappropriate and interfere with social interactions.

Social skills interventions have typically targeted decreases in grossly inappropriate behavior such as aggression or have targeted skill building in appropriate social behavior such as initiating conversation and making eye contact (Davies & Rogers, 1985; Foxx & Faw, 1992; Garris & Hazinsky, 1988). However, Wright *et al.* (1992) focused on decreasing behaviors such as directly exposing genitalia in public in their case description of an adult with Down syndrome. Their intervention focused on structuring demand situations and ignoring problem behavior paired with a token system. In addition, they conducted extensive social skills training that focused on proper grooming, social contact, and "cocktail party" conversation. However, the structure of the token economy was not clearly described and the authors could not determine which treatment components were responsible for the treatment effect.

Mace and Lalli (1991) also decreased inappropriate social behavior in the form of bizarre speech in a man with mild mental retardation. Their analyses indicated that bizarre speech might be maintained by attention and that two interventions were effective in reducing bizarre speech: noncontingent attention and social language skills training. Their analysis indicated that either approach was equally effective in targeting one topography of problematic social behavior. The current study extends the literature by providing a controlled demonstration of the use of a DRO procedure within the context of a token economy with response cost for several topographies of inappropriate social behaviors.

## METHOD

### Participant and Setting

Steve was a 26-year-old male with moderate mental retardation who could speak in short complete sentences. He resided at home with his mother and participated in an adult day leisure program in his community. Steve's speech was sometimes difficult to understand; however, he commonly used hand gestures and facial expressions to communicate effectively. Steve frequently initiated social interactions with others and could sustain social interaction for an extended

period of time using appropriate conversational skills. During those social interactions, however, Steve frequently engaged in inappropriate social behaviors including hugging or kissing others, and failing to maintain appropriate interpersonal distance (e.g., leaning his face within inches of others). In addition, during social interactions Steve frequently exhibited inappropriate sexual behavior and frequently swore.

During an inpatient hospital stay for medical evaluation and treatment of other behavioral difficulties, Steve's mother and day program requested a social skills intervention to target these categories of social behavior. The analysis was conducted in a living area on the inpatient unit during semi-structured social interactions. Highly preferred items were available for Steve and a preferred staff member was present for the primary purpose of interacting with Steve. Steve, the staff person and the data collectors were the only people present for any sessions. All sessions were 10 min in length and several sessions were conducted each day.

## Data Collection and Interobserver Agreement

During all social interaction sessions, trained observers used laptop computers to record the frequency of several target behaviors. *Inappropriate social interactions* were defined as: (i) placing his face or head within 6" of another person's head or body; and (ii) touching or kissing another's head, face, torso. *Inappropriate sexual behavior* was defined as touching his genital area over his clothes (typically occurred as a discrete response lasting 2–3 s). *Verbal aggression* was defined as swearing or aggressive and insulting statements such as "I hate you". Two independent observers recorded data on all behaviors simultaneously but independently during 45% of the sessions. Agreement coefficients were calculated by partitioning each session into 10 min intervals and dividing the number of exact agreements plus disagreements on the frequency of the behavior by the sum of agreements plus disagreements by 100%. The mean exact agreement was 94% for inappropriate social interactions (range 90–100%), 88% for inappropriate sexual behavior (range 80–100%), and 93% for verbal aggression (range 83–100%).

## Procedure and Design

### *Baseline*

The baseline condition consisted of a dense schedule of noncontingent attention (minimum of 30 s of each min) plus interaction contingent upon appropriate

social initiations. Specifically, the therapist was available to talk with Steve or utilize leisure objects with him any time he initiated. In addition, the therapist initiated social interaction or praised social interaction every 30 s (FT – 30 s) throughout all sessions. This combination of contingent and noncontingent attention was chosen because it represented the most likely situation for the occurrence of the target behaviors. Thus, if treatment were successful in this context, then it would likely be effective in other contexts that were less likely to occasion problematic behavior. The therapist ignored all target behaviors in baseline sessions. That is, the therapist made no physical (e.g. pulling away) or verbal response to any target behavior and continued with the social interaction as if no problem behavior had occurred.

### *Token Economy Training*

The token economy training was conducted with Steve in the same area as the treatment evaluation. The tokens were laminated photocopies (reduced in size) of dollars with Steve's name on them. For training purposes, Steve was prompted to exhibit a randomly chosen target behavior "shake hands" and was immediately praised and handed a token and told that he had earned the token for shaking hands. Steve was told that he could trade the tokens for access to several preferred items including preferred foods, leisure objects, and activities. Next, three trials for earning tokens were conducted (one per trial) and a brief delay between earning the tokens and trading the tokens was introduced. Different prices were set for access to different items and activities. Steve's understanding of the procedure was verified by asking him a series of comprehension questions. The questions were: "What can you earn?", "What can you do with the tokens?", and "When can you use the tokens?". Steve was able to answer each of these questions correctly after minimal training. Steve was also informed of the response-cost component of the intervention. He was told, "If you (a target behavior was described), then we will take away one token like this", and a token was removed.

### *Token Economy with Response Cost (DRO based)*

After the token economy training program was completed, the intervention was implemented for each target behavior (inappropriate social interactions) successively in accordance with a multiple-baseline design. The setting and interaction schedules remained the same as in baseline (combination of contingent and noncontingent attention). The initial DRO interval for earning tokens was set by computing the mean inter-response time for the occurrence of the first target behavior (inappropriate social interactions) for all baseline

sessions and dividing by 50%. At the beginning of each session, Steve received five tokens that he stored in a pouch around his waist. He was instructed that he could earn a token if he did not exhibit any of the behaviors meeting the definition for inappropriate social interaction for a pre-determined amount of time. In addition, Steve was informed that if he did exhibit a target behavior the timer would start over and he would lose a token from his existing fund.

### **Re-calculating DRO Intervals and Schedule Thinning**

After successfully implementing the program with the first target behavior, the intervention was implemented with the other two behaviors in turn. As each target behavior was added, the mean inter-response time was recalculated as the shortest mean inter-response time during baseline sessions for any behaviors currently in the intervention phase. After the intervention was implemented for each category, DRO schedule thinning was initiated according to the schedule in Table 1. Steps in thinning the schedule generally represent a 33 to 50 percent increase from the previous DRO interval until the target interval equaled the length of the entire session length of 10 mins (see table). The criterion for increasing the DRO interval was a 90% or greater reduction from baseline for two consecutive sessions. If Steve's problem behavior did not remain at a 90% reduction for two consecutive sessions, the DRO interval was again decreased to the last successful interval.

## **RESULTS AND DISCUSSION**

The results of the intervention in the analogue setting are shown in Figure 1. During baseline, inappropriate social interactions occurred at an average rate of 4.6 responses per min, and verbal aggression occurred at an average rate of 1.3 responses per min, while inappropriate sexual behavior occurred at a rate of 3.1 responses per min. The token economy with response cost procedure effectively reduced and eventually eliminated each of the targeted behaviors (99% reduction in inappropriate social interactions, 97% reduction in verbal aggression, and 97% reduction in inappropriate sexual behavior). In addition, these reductions were maintained as the DRO interval was increased to include the entire 10 min session. Both staff and Steve's mother reported that a 10 min DRO interval was manageable and appropriate and that they felt comfortable bringing Steve to public settings with the intervention in place. Follow-up data collected

Table 1. Steps for schedule thinning for DRO interval from 20 seconds to the terminal point of 600 seconds (total session length)

Step	Session implemented	Interval (s)	% increase
1	22	30	33
2	24	45	50
3	26	60	33
4	28	120	100
5	30	160	33
6	32	240	50
7	34	330	38
8	36	450	37
9	39	600	33

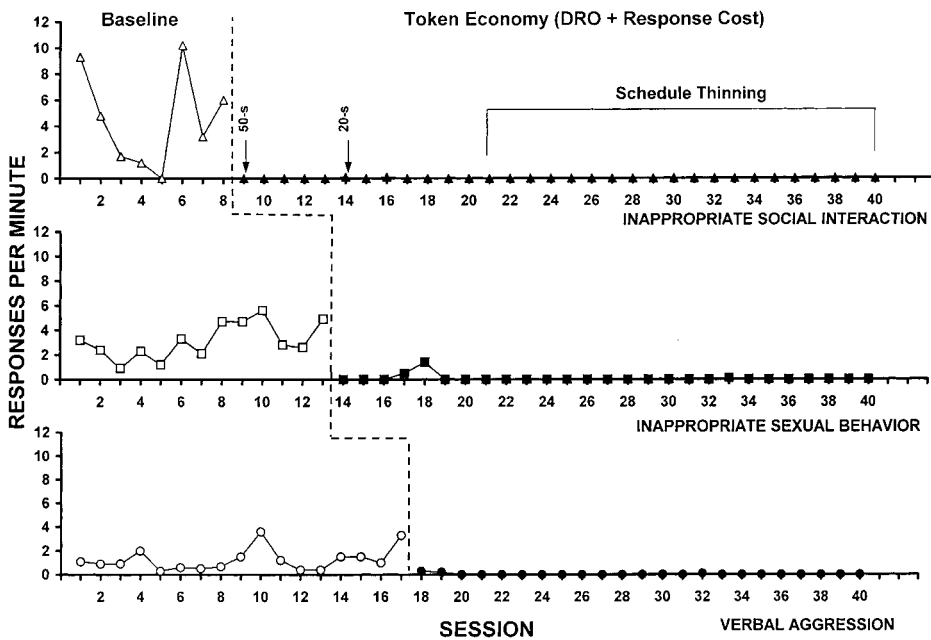


Figure 1. Inappropriate behaviors for Steve are depicted as responses per minute.

throughout the day in natural interactions indicated that target behaviors remained very low (greater than 90% reduction from baseline) providing some evidence for generalization and maintenance.

The current study evaluated the effects of a token economy procedure on several categories of target behaviors including verbal aggression, inappropriate

social interactions, and inappropriate sexual behavior. The DRO-based token economy with response-cost intervention was effective in targeting multiple inappropriate social behaviors simultaneously for this adult with mental retardation. This intervention advances the literature on social skills and the use of token economy interventions with individuals with developmental disabilities in two ways.

First, this study focused on moderating or eliminating inappropriate social behavior. Most social skills interventions are designed to increase social interactions; however, instances of excessive social interactions can also be problematic. With individuals who exhibit excessive levels of social behavior, interventions may be necessary to assist the client in moderating the level of use of certain social behaviors rather than increase social behavior. For example, this young man had been observed to exhibit a variety of appropriate social behaviors such as conversational skills, interactive use of leisure activities, requesting social interactions, greetings, and hand shaking. However, he too frequently interacted with people in a more physical and inappropriately intimate manner. During the course of this intervention, this client began to shift from attempts to hug, kiss, and grab others to other more appropriate social behaviors such as conversation, playing catch, making eye contact, and gaining attention by saying "excuse me" and tapping the shoulder. Although the intervention did not directly target these behaviors, the client readily switched to these more appropriate forms of social interactions when other forms resulted in a negative consequence. Future investigations should include direct analysis of the effects of intervention on appropriate behavior as well as inappropriate behavior. In addition, future investigations could include a more extensive analysis of maintenance and generalization of treatment effects.

Second, this study advances the literature by describing a social skills intervention that can be modified to include additional behaviors as they become problematic. As social context changes social behavior changes and new behaviors may become problematic. With a treatment system such as a token economy, new behaviors can be targeted and rules can be modified quickly and easily to respond to changing treatment needs. In addition, this study is relatively unique in the implementation of a DRO procedure with the context of a token economy. Most implementations of token economy have used differential reinforcement of alternative behavior (DRA) schedules but DRO schedules are also appropriate in some situations. Conversely, most DRO interventions are used to target only one problem behavior and the immediate delivery of reinforcers can be cumbersome if the stimuli are tangible objects. Introducing the context of a token economy allows an easy means for implementing the DRO procedure in public where only tokens need be immediately available.

This study has at least two limitations that also indicate areas for future investigation. First, the immediate implementation of the token economy included a response-cost component. We implemented the treatment procedure as a package to maximize the treatment effects as quickly as possible instead of attempting the token economy without response-cost component initially. We used this strategy because the client was being treated for multiple problems in a very expensive medical setting and time constraints were an important factor in treatment planning. The procedure was so effective that response cost was rarely implemented, but this data set does not indicate whether response cost was an important treatment component. The procedure might have been just as effective without the response-cost component and future studies should examine this question by directly comparing conditions with and without response cost.

Some might also consider the lack of functional assessment a limitation. However, the reader should note that our purpose was a controlled demonstration of an effective intervention that could be used to target multiple problems regardless of function. We did not intend to examine the specific behavioral mechanism responsible for each inappropriate behavior and we were able to successfully intervene without such an analysis. Several possible variables could have been maintaining inappropriate interactions including (a) social attention or access to tangible items or (b) a combination of social and nonsocial consequences. Regardless of the function of these behaviors, one intervention was effective at eliminating all problem behaviors. The intervention may have been effective because (a) the consequences in effect for inappropriate behavior were stronger than any maintaining variables, (b) we inadvertently addressed some maintaining variable in the intervention, (c) instructions helped Steve to discriminate appropriate from inappropriate social behavior, or (d) some combination of these factors. The current analysis does not permit us to draw conclusions about the factors responsible for treatment effectiveness.

Although the current study and past social skills interventions have not incorporated functional assessment procedures, the application of functional assessment procedures to social skills would be an interesting avenue for future research. Other researchers and clinicians might choose to subject social behaviors to functional assessment procedures and evaluate whether function-based treatments are more effective and more cost efficient than non-function-based interventions. In summary, this investigation presents a clear demonstration of an effective intervention for multiple concurrent social skills problems in a man with mental retardation. The client was able to demonstrate understanding of the treatment procedure (token economy) and the individuals who would administer the intervention report that it was easy to understand and implement.



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