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Using a Time Timer™ to increase appropriate waiting behavior in a child with developmental disabilities

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ABSTRACT

This study aimed to examine the use of a predictive stimulus (Time Timer™) and delayed reinforcement to increase appropriate waiting behavior in a child with developmental disabilities and problem behavior maintained by access to tangible items and activities. The study employed a changing criterion design across settings to gradually increase reinforcement delay from 1 s to 10 min. Firstly a baseline phase was conducted to measure the duration of appropriate waiting behavior to access tangible reinforcers/activities. Phase 2 involved the use of a red cue card and the verbal instruction “wait”. Phase 3 involved the introduction of the Time Timer™ with the cue card attached, and the verbal instruction “wait”. Finally, Phase 4 utilised the Time Timer™ without the cue card. This method was an effective strategy for increasing appropriate waiting behavior with this participant in a school setting. The role of adding a concurrent activity during the reinforcement delay, using cues to predict reinforcement, future generalization, maintenance and the teaching of functionally equivalent skills are discussed.

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Impulsiveness and self-control can be operationalised as choice-making behavior between a larger, delayed reinforcer and a smaller, more immediate reinforcer (Jackson & Hackenberg, 1996). Impulsive behavior occurs when responding produces more immediate, relatively smaller reinforcers at the cost

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of delayed, larger reinforcers. Self-control occurs when responding produces greater delayed reinforcers at the expense of more immediate, smaller reinforcers (Logue, 1995; Dixon et al., 1998). Behaviors that yield delayed reinforcement are highly adaptive in day-to-day life (Stromer, McComan, & Rehfeldt, 2000), and as such are a socially significant behavior and worth investigating in applied behavior analysis.

Various methods have been used to establish and maintain reinforcement delay. Schweitzer and Sulzer-Azaroff (1988) described one method whereby the delay is gradually increased for a larger reinforcer while the smaller reinforcer remains immediately available. Dixon and Cummins (2001) extended this research further by illustrating that self-control may be increased by establishing a history in which participants are gradually exposed to progressive delays, and are concurrently given the choice to engage in an intervening activity during that delay. Participants had a choice between: (a) a small immediate reinforcer, (b) a larger delayed item without a response requirement during the delay, and (c) a larger delayed item with a response requirement during the delay. All participants showed a preference for the latter option, and during this contingency, no problem behaviors occurred. However, these studies do not examine visual supports or cues that may serve to predict the availability of reinforcement.

Williams (1999) found that choice for delayed reinforcement would be more likely when stimuli presented during the delay reliably predicted reinforcement. Further studies have used tokens, points and star charts as the predictive stimuli (Kazdin, 1982). In these cases the stimuli that predict reinforcement at the end of the delay may serve as conditioned reinforcers through multiple pairings with the delayed reinforcers. However, it has been noted that more naturally occurring conditioned reinforcers as predictive stimuli would be useful for ensuring generalization to other settings (Williams & Dunn, 1991). These could be verbal in nature, such as praise from a parent, teacher or caregiver, or verbal reminders of the reinforcement that is to occur (Hayes & Hayes, 1993).

However, people with developmental disabilities may not respond well to verbal instructions due to limited or absent verbal comprehension repertoires. Individuals with a developmental disability often present with a restricted verbal repertoire, which is a common factor associated with impulsivity (Mischel & Mischel, 1983). It has been suggested that an adult human's increased preference for delayed, larger reinforcers may somehow be linked to their advanced verbal abilities (Schweitzer & Sulzer-Azaroff, 1988). This may explain why people with a limited verbal capacity experience difficulties in waiting for delayed reinforcement.

Another important aspect of stimuli that predict reinforcement is the length of time one is required to wait before the reinforcer is delivered. Vollmer, Borrero, Lalli, and Daniel (1999) demonstrated that participants with developmental disabilities and severe challenging behaviors were more likely to exhibit self-control than impulsive choices when the longer delays were signalled rather than unsignalled. They also recommended that a further investigation into 'timed' delays (the availability of a visual timer throughout the delay) for future research.

An examination of impulsivity and self-control with regards to individuals with intellectual disabilities and problem behavior is important. Access to consumable or tangible reinforcers frequently maintains severe behavior problems displayed by such individuals (Vollmer et al., 1999). Many studies have focused on impulsive behavior maintained by token reinforcement (money) and not on tangible or attention maintained behaviors that are also sensitive to impulsivity (Vollmer et al., 1999).

In the case of signalled reinforcement delay to promote coping and tolerance skills, the appropriate 'waiting' behavior is essentially under the stimulus control of the signal (verbal instruction or visual cue). Approaching the treatment of tolerance in delayed reinforcement with persons with developmental disabilities using signalled reinforcement delay could be very useful for maintenance and generalization of the appropriate behavior. In addition, the use of stimulus fading that includes highlighting a physical dimension (e.g., colour, size, etc.) of a stimulus to increase the likelihood of a correct response followed by a systematic fading of the exaggerated dimension could be applied to promote appropriate behavior during delayed reinforcement (Cooper, Heron, & Heward, 2007).

The present study aims to increase appropriate 'waiting' behavior using a Time TimerTM with an individual presenting with problem behavior maintained by access to tangible reinforcement. It employs a changing criterion design with the application of a Time TimerTM as a predictive stimulus. A

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