Affordable ABA

Interventions for Decreasing Problem Behavior

Introduction

Applied behavior analysis (ABA) is a scientific approach to the study of behavior. Through this field, behavior analysts can observe behavior in the natural environment and identify what is maintaining the behavior and any environmental factors that are preventing other behaviors from being exhibited. Appropriate replacement behaviors are identified for the challenging behavior being exhibited and reinforcement is provided for alternative or more appropriate behaviors.

Behavioral interventions are typically implemented with individuals in an effort to reduce or eliminate a challenging behavior or to increase an adaptive, more appropriate behavior. These interventions usually include the integration of some type of environmental manipulation. A multitude of interventions that are evidence-based are available for behavior analysts to integrate into a program in an effort to reduce the exhibition of challenging behaviors. Some of these interventions include antecedent interventions while other interventions include the use of an extinction procedure.

In this course, participants will learn to (1) identify antecedent interventions for challenging behaviors, (2) identify function-based extinction procedures for use with challenging behaviors, and (3) discuss token economies and the limitations that are associated with using these systems.

Section 1: Antecedent Interventions for Challenging Behavior

Behavioral interventions that are implemented with the intent to reduce or eliminate challenging behavior usually include the integration of some type of environmental manipulation. When an event or condition is manipulated that occurs prior to the exhibition of the challenging behavior, this is termed an

antecedent intervention. Antecedent interventions can be divided into two categories: default and function-based.

Default interventions are interventions that do not require the identification of the variables that establish the condition for and maintain the challenging behavior. These types of interventions can be viable for challenging behaviors that are maintained by a range of different reinforcers. For example, default interventions can include restraint measures, the use of protective equipment, and enrichment that can occur within the environment.

On the other hand, function-based interventions necessitate that the variables, both antecedents and consequences, that maintain the challenging behavior are identified. Furthermore, these interventions also require that a minimum of one variable/component is directly manipulated within the operant contingency. The consequence that maintains the challenging behavior is known as a functional reinforcer. An example of a function-based intervention is noncontingent reinforcement (NCR) which includes the delivery of a functional reinforcer to be scheduled based on a time-based and response-independent schedule (Vollmer, 1999).

Additionally, antecedent interventions can also be categorized by the mechanism that is used to decrease challenging behavior. Some of the interventions that are implemented can affect an individual's motivating operations for challenging behavior (Fisher et al., 2018) while other interventions may alter discriminative functions. A motivating operation can alter a consequence and the probability of behavior in that moment that has produced these consequences previously in a temporary manner. NCR is an example of a motivating operation based procedure as it decreases the exhibition of challenging behavior by abolishing the reinforcing effectiveness of the consequences through use of satiation or habituation. On the other hand, discriminative control over the challenging behavior can be altered.

Challenging behavior will tend to decrease in environments or contexts where a functional reinforcer is no longer produced. In these situations, the environment or context will become an S-delta. An environment can be altered in such a way that makes it difficult for the individual to exhibit the challenging behavior. These situations often use restraint or protective equipment.

Default Interventions

There are some antecedent interventions that are available that will decrease the occurrence of a challenging behavior regardless of the operant function that exists for the challenging behavior. As these interventions are implemented, the mechanisms that are associated with the effects that occur because of these interventions may not be understood when compared to an intervention that is associated with a reinforcement contingency. Some default interventions do have the capability to alter discriminative stimuli or motivating operations; however, being able to identify the contingency that is maintaining the challenging behaviors is not a requirement of an effective default intervention. There are several examples of a default intervention: antecedent exercise, enrichment of an environment, and restriction of a response.

Antecedent Exercise

Antecedent exercise can be used to decrease challenging behavior (Lochbaum & Crews, 2003). This type of intervention engages individuals in various activities that require effort on the part of the individuals such as jogging, walking, weight lifting or even roller skating that are independent of occurrences of challenging behavior. With these interventions, a behavior analyst will conduct a series of observations either during or within a few minutes after the exercise activity has been completed. Antecedent exercise has been used to decrease challenging

behavior such as self-injurious behavior (Baumeister & MacLean, 1984), aggression (Powers et al., 1992), and stereotypy (Celiberti et al., 1997).

It is thought that antecedent exercise can lead to a general state of fatigue which results in a decrease in challenging behavior and an increase in various appropriate behaviors. However, this thought is somewhat paradoxical and other implications have been suggested. Antecedent exercise may ultimately alter the reinforcer effectiveness of the consequences that are maintaining the challenging behavior. Antecedent exercise may also function as matched stimulation where the exercise is allowing free access to similar stimulation that the challenging behavior would typically provide. This would then function as an abolishing operation for the maintaining reinforcer.

There are several benefits associated with using an antecedent intervention. Antecedent exercise can be used to decrease challenging behavior, increase appropriate behavior, and improve the health of an individual both on a physical and psychological level. There are also physiological and medical benefits associated with using an exercise program such as improved muscle tone and adaptive skills. There are limitations, though, that are associated with implementing an antecedent intervention such as antecedent exercise. One limitation is that the effects of antecedent exercise may only be temporary and only exhibited for a small amount of time after the exercise has been completed. Research indicates that the effects of exercise on challenging behaviors appears to be transient (Mays, 2013). On the other hand, some research indicates that the effects of antecedent exercise can maintain for several hours after the exercise has ended (Cannella-Malone, Tullis, & Kazee, 2011). These conflicting results suggest that further research is needed regarding the effects of antecedent exercise on challenging behavior. An additional limitation of antecedent exercise is that it may become problematic or even impossible to implement in some environments or

conditions. For example, it may be impossible to implement antecedent exercise while an individual is receiving academic instruction.

Enriched Environment

Antecedent conditions can also be manipulated in such a way to decrease challenging behaviors by surrounding the individual with a stimulus-enriched environment. An environment can be enriched by ensuring that preferred objects, toys, educational materials, items used for leisure, social interaction, or any combination of the aforementioned items are available on a continuous, response-independent schedule. Enriching an environment has been found to be beneficial at reducing self-injurious and stereotypic behaviors (Rapp, 2006). Although problem behaviors that are maintained by social reinforcement may be effectively reduced through use of an enriched environment, most of the research that has focused on this topic have found that it may be more appropriately used to treat behaviors that are automatically reinforced.

There are a couple of reasons as to why it is believed that an enriched environment is effective at reducing behaviors. One reason is associated with the competition that may exist between behavior that is allocated toward the stimuli that are enriching and the challenging behavior. The enrichment within the environment may be effective at reducing challenging behavior indirectly as it provides an alternative and competing source of reinforcement. Research has indicated that enrichment of an environment can be more effective if the stimuli within the environment are highly preferred when compared to less preferred stimuli (Vollmer, Marcus, & LeBlanc, 1994). Another reason that may contribute toward the effectiveness of the use of an enriched environment may be that the enriched environment may function as an abolishing operation and actually reduce the occurrence of challenging behavior if the consequences and those of the materials within the enriched environment are similar. Under these

circumstances, an enriched environment would be considered a function-based intervention as the effectiveness of the environment would be dependent on a functional match or a relation of substitutability between the reinforcers that are produced within the enriched environment and those that are maintaining the challenging behavior. The effectiveness that is associated with a reinforcer for a challenging behavior may be reduced or abolished through the use of satiation or habituation as the enriched environment is able to produce the same or similar reinforcement for the individual.

There are several benefits that are associated with the use of an enriched environment. This type of environment can have effects on the brain such as increased plasticity in the cerebral cortex. Learning and memory can also be improved. Additionally, using an enriched environment is simple, straightforward, able to be implemented easily, and can be cost-effective.

Response Restriction

Response restriction occurs when an intervention is implemented that physically impedes the occurrence or completion of a challenging behavior. These types of interventions include restraint, protective equipment, and other means that are implemented to either mitigate or prevent an individual from being injured as a result of the occurrence of a challenging behavior. These interventions are often highly effective at decreasing or eliminating the occurrence of a challenging behavior. However, individuals often find these types of interventions to be intrusive, undesirable, or even inadequate as an approach and should only be used in a crisis situation, when a challenging behavior poses a risk to someone's safety, or when a challenging behavior can create significant property damage.

Personal restraint is known for physically holding onto or securing an individual's body parts as a method of ensuring that the exhibition of challenging behavior cannot occur. This type of intervention is typically implemented after an

occurrence of challenging behavior has started. When used in this manner, this is known as a consequence-based intervention. However, personal restraint can also be implemented as an antecedent intervention, especially in a situation or environment where challenging behavior is likely to occur. For example, a child may be likely to engage in challenging behavior when taken to a doctor appointment. Mechanical restraint may be implemented if the child has previously engaged in challenging behavior at a medical appointment. Mechanical restraint includes the use of a device that secures an individual's limbs and body parts such as four-point restraints, arm splints, or even straight jackets. Protective equipment can be similar to mechanical restraint as it also requires the use of a device. However, protective equipment typically allows the individual that is wearing the equipment to freely engage in movement that is not restricted but does not allow the challenging behavior to produce damage or injury. It is viewed as being less confining than the implementation of a restraint. It can include the use of a padded helmet, a wheelchair belt, or even safety goggles and is typically used with individuals that exhibit self-injurious behaviors.

While either restraints or protective equipment are being implemented, the occurrence of challenging behavior is typically reduced or even eliminated as these interventions are designed to restrict the occurrence of challenging behavior. While this may be beneficial, there are still significant limitations that are present with the use of either of these interventions. Restraint procedures are typically intrusive and disrupt any activity that is occurring at the time of implementation. This intervention also prevents an individual from accessing or engaging in any occurrence of an alternative behavior that is appropriate such as learning activities or social opportunities. Restrictive restraint procedures are viewed as being nonconstructive as they significantly impede an individual from acquiring an alternative or replacement behavior. Additionally, aversive properties are often associated with restraints for some individuals. The application of

restraint, as an antecedent intervention, is frequently accompanied by the exhibition of avoidance or escape behaviors. At times, a caregiver or stakeholder may threaten the use of restraint to an individual if this threat appears aversive, or they may use restraint as a form of punishment. Furthermore, there are times when individuals that engage in self-injurious behaviors actively look for an opportunity to be placed in a restraint or to self-restrain themselves. An individual may exhibit challenging behavior as a method for producing access to a form of restraint. This challenging behavior can interfere with an individual's ability to demonstrate a behavior that is habilitative or desirable. Lastly, when an individual's ability to engage in a behavior is restricted, this may in turn actually increase one's motivation to exhibit that behavior. Restraint may only be postponing one's ability to exhibit a behavior and as a result actually exacerbate that behavior instead of reducing the occurrence of the behavior.

Function-based Interventions

A function-based intervention can be developed if the operant function of the challenging behavior has been identified. A function-based intervention aligns specifically to a maintaining contingency of reinforcement. Therefore, interventions may be different depending on the contingency that has been identified in maintaining the challenging behavior. A function-based antecedent intervention is one that manipulates an individual's motivating operations, the discriminative stimuli within the environment, or a combination of both.

Noncontingent Reinforcement

When noncontingent reinforcement is utilized, the reinforcing consequence for a challenging behavior is provided on a time-based or response-independent schedule. The functional reinforcer is typically withheld when an individual exhibits the challenging behavior, meaning that the challenging behavior is placed

on extinction. When noncontingent reinforcement is initially being used, the schedule is dense and the functional reinforcer is provided to the individual frequently. The schedule of noncontingent reinforcement may then be thinned systematically and often determined based on low rates of the challenging behavior. Ideally, the schedule that is maintained should be manageable within the individual's natural environment or when effective parameters of noncontingent reinforcement are reached as continued thinning of the reinforcement schedule produces an increase in occurrence that is unacceptable for demonstration of the challenging behavior. Research studies have indicated that noncontingent reinforcement can be used as an effective intervention for treatment of self-injurious behaviors (Vollmer et al., 1993), aggression (Lalli, Casey, & Kates, 1997), refusal of food (Cooper et al., 1995), and pseudoseizures (DeLeon, Uy, & Gutshall, 2005).

There have been some behavior analysts throughout the years that have criticized the term noncontingent reinforcement. This criticism is primarily due to the reinforcement involving a contingency and the target of the reinforcement through use of noncontingent reinforcement is not clear. These criticisms have been noted by some behavior analysts and with that recognition has come a change in terminology and more technically correct descriptors such as time-based delivery.

The use of noncontingent reinforcement procedures vary depending on the functional properties that are associated with the challenging behavior. Although most procedures that use noncontingent reinforcement include time-based deliveries and withhold functional reinforcement for the exhibition of challenging behavior, there have been some research studies that have demonstrated that stimulus presentation alone without the use of extinction is still able to produce a reduction in challenging behavior (Fisher et al., 1999). Additionally, some research has evaluated the effects of presenting stimuli other than the functional reinforcer

for the challenging behavior. One study demonstrated that a time-based delivery of a stimulus that was identified as being preferred by the individual was just as effective as the delivery of attention (i.e., functional reinforcer) for decreasing challenging behavior (Hanley et al., 1997).

The use of noncontingent reinforcement for challenging behavior that is maintained by escape from stimuli or activities that are aversive is provided through the use of time-based breaks from these particular events. Research has demonstrated the use of breaks from training activities to reduce challenging behavior (Vollmer et al., 1995). At first, the reinforcement schedule that was provided was dense with one participant not undergoing any training tasks and another participant receiving training tasks that lasted 15 seconds before being provided a break of 20 seconds. The schedule of breaks was then systematically decreased depending on the level of challenging behavior in previous sessions for each participant. At this point, one participant received a break that lasted for 30 seconds every 10 minutes, and the other participant received a break for 20 seconds every 2.5 minutes. Additionally, other researchers have demonstrated that providing access to a positive reinforcer on a time-based schedule can result in a decrease in challenging behavior that is being maintained by negative reinforcement (Cooper et al., 1995; Reed et al., 2004). The results of this research have been mixed. In some of these studies, it was found that positive noncontingent reinforcement was successful at decreasing challenging behavior and increasing appropriate behavior (Wilder et al., 2005); however, other components and interventions were required in order to produce results that were clinically acceptable for other individuals (Piazza et al., 2003; Reed et al., 2004). These findings within the research demonstrate the need for further research that evaluates the effectiveness of positive noncontingent reinforcement to decrease challenging behavior that is maintained by negative reinforcement.

When noncontingent reinforcement is used as an intervention for challenging behavior that is maintained by automatic reinforcement, an attempt is made to identify the automatically produced reinforcer for the challenging behavior followed by provision of that event on a time-based schedule. Research has demonstrated the effects of individuals being provided with noncontingent access to stimuli that align with the topographies of self-injurious behaviors for different participants (Favell et al., 1982). Toys and items that had distinctive visual properties (i.e., lights, bright colors) were provided to participants that exhibited eye poking behavior. Toys and small food items were provided to participants that exhibited hand mouthing or pica behavior. Results of this study indicated that by providing noncontingent access, it appeared to match the hypothesized functional properties of the challenging behavior that was maintained by automatic reinforcement and subsequently reduced the occurrence of challenging behavior in some participants. Although this research demonstrates the importance of choosing stimuli that appear to produce stimulation similar to that which is involved in the maintaining of the challenging behavior in noncontingent reinforcement arrangements, other research indicates that a match in this stimulation may not always be required. Researchers have evaluated the effects of competing stimuli for noncontingent reinforcement with challenging behavior that is maintained by automatic reinforcement (Piazza et al., 1996; Ringdahl et al., 1997). Individuals have been provided with access to stimuli as a method for identifying whether they are associated with high levels of engagement and low rates of challenging behavior. The use of competing-stimulus assessments as a way for identifying arbitrary stimuli for noncontingent reinforcement arrangements has shown to be a possible approach, especially when there is often difficulty in identifying the hypothesized functioning properties of challenging behavior that is maintained by automatic reinforcement.

There are several principles that are associated with the effects that noncontingent reinforcement has on challenging behavior. One possible explanation that has been provided is that frequent and repeated contact with a functional reinforcer for challenging behavior during noncontingent reinforcement schedules may act as an abolishing operation. This, in turn, may decrease the effectiveness of a functional reinforcer on a temporary basis as well as decrease the class of behaviors that are also maintained by that particular reinforcer (Laraway et al., 2003). Some have led the beliefs with satiation as being the principle responsible for decreasing the effectiveness of the reinforcer; however, others offer habituation as being able to better account for the effects that are produced. The term habituation refers to a decrease in responsiveness that occurs to stimuli after the stimuli have been repeatedly presented and is often aligned with respondent behavior. Habituation occurs based on fixed rather than variable schedules of presentation of stimuli. It also predicts that a fixed time schedule would be able to more effectively abolish the effects that a functional reinforcer may have when compared to the effects that are demonstrated by a functional reinforcer on a variable time schedule. Although, there is some research that suggests that a variable time schedule is able to more effectively suppress responding (Ono, 1987). Additionally, the effects of noncontingent reinforcement are possibly enhanced due to the variation that is presented within the stimuli that are presented (i.e., type, magnitude, mode). This may be accounted for by stimulus specificity where changes in the stimuli that are presented are unpredictable and can disrupt habituation.

Despite whether one contributes the effects of repeated stimulus exposure to either habituation or satiation, both of these align with the idea that noncontingent reinforcement schedules are able to decrease challenging behaviors as a result of an abolishing operation effect. This type of procedure works to produce a decrease in the value of the functional reinforcer. It also

further decreases the responses that have previously produced the reinforcer. Also, noncontingent reinforcement may decrease the exhibition of behavior due to the reinforcement contingency being disrupted. Noncontingent reinforcement procedures typically contain an extinction component within the intervention as the functional reinforcer is not presented contingent on the exhibition of the challenging behavior. The response independent delivery of the functional reinforcer then further causes a disruption for the challenging behavior reinforcer contingency. This means that the decrease that is exhibited within the challenging behavior may be due in part to the function of extinction.

There have been several researchers that have further evaluated the effects of extinction and abolishing operations on the reductive effects of noncontingent reinforcement. Some research has indicated that when a combination of noncontingent reinforcement schedules and concurrent schedules of response contingent access to the same reinforcer are demonstrated, responses that occurred with contingent reinforcement were low when the noncontingent reinforcement schedules were dense. These exhibition rates then increased as the noncontingent reinforcement schedules were thinned (Goh et al., 2000). Other research has demonstrated that challenging behaviors were exhibited during schedules of noncontingent reinforcement without extinction (Kahng et al., 2000) as the noncontingent reinforcement schedule is thinned (Simmons et al., 2003).

When noncontingent reinforcement is abruptly discontinued, it should result in an immediate increase in the exhibition of challenging behavior when evaluating the effects of extinction. On the other hand, when evaluating abolishing operations, the challenging behavior will occur at a low level initially, followed by an increase as the individual experiences deprivation from the functional reinforcer. Therefore, it may be possible that the effects that are produced by noncontingent reinforcement are due to a combination of both extinction and motivational processes.

An additional reason that may account for the effects of noncontingent reinforcement is that time based delivery of reinforcement can produce adventitious reinforcement of an alternative behavior that possibly competes with the challenging behavior. Research has focused on evaluating these effects (Ecott & Critchfield, 2004). Results of this research indicated that behavior that was previously maintained by contingent reinforcement decreased and the exhibition of the alternative behavior increased during noncontingent reinforcement. This suggested that the alternative behavior was adventitiously being reinforced during the time frame when noncontingent reinforcement was delivered. The response reallocation that was demonstrated within this research was consistent with a procedure known as matching law (McDowell, 1989). Matching law refers to relative rates of responding that are among different response options corresponding to relative rates of reinforcement for these response options. Matching law proposes that noncontingent reinforcement may actually reinforce the alternative behavior, which then results in the behavior being maintained by alternative reinforcement instead of the challenging behavior.

There are both strengths and limitations that are associated with noncontingent reinforcement. Noncontingent reinforcement is a procedure that has the potential to be effective at decreasing or even eliminating challenging behavior. The effects of noncontingent reinforcement can be rapid and can be counteractive to the negative side effects that are associated with extinction (i.e., aggression, response bursts). Noncontingent reinforcement also does produce deprivation when functional reinforcers are used. This means that the exhibition of challenging behavior may not resurface as quickly if different events disrupt the intervention on occasion and the schedule of reinforcement thins or stops temporarily. The use of noncontingent reinforcement has been noted as being socially acceptable and easy to use as an intervention (Vollmer et al., 2003).

Even though there are many strengths that are associated with the implementation of noncontingent reinforcement, there are also several limitations that are apparent. Noncontingent reinforcement is not designed to create an appropriate alternative behavior, and the effectiveness of training may end up being limited as a result of the potential abolishing operation effects that exist. Noncontingent reinforcement may also produce adventitious reinforcement of an unspecified behavior. This behavior may be a targeted behavior or a challenging behavior. Differential reinforcement has been recommended as a method for overcoming this particular limitation.

Stimulus Control Strategies

Research has indicated that challenging behavior can be brought under stimulus control through the use of differential reinforcement. Stimulus control occurs when an antecedent event, stimulus, or a condition are able to regulate a behavior due to the history of differential consequences when these items are present versus when they are absent (Michael, 2004). These stimuli result in predicting or signaling a change in contingencies which then changes the behavior in their presence. These stimuli then become discriminative.

Stimulus control is typically viewed as an antecedent process although it contains both antecedent and consequent manipulations. The effectiveness of the discriminative stimuli is determined by the differential consequences that ultimately produce discriminative control. As a result, stimulus control strategies relate to the different characteristics and effects associated with various consequences. Over time, researchers have been able to use different stimulus control procedures as a method for treating challenging behaviors. They have been able to use discrimination training as a way to treat challenging behavior that is viewed as only being problematic when that behavior occurs in specific circumstances. For example, when a person eats or consumes food that is found in

a refrigerator, it is typically viewed as not being problematic. However, if this same person eats or consumes food that is found in a refrigerator that belongs to another person, then this behavior becomes problematic. Researchers have paired mild reprimands and used a warning sticker that was placed on the prohibited foods as a method for decreasing food stealing (Maglieri et al., 2000). Results indicated that the individual only consumed foods that did not contain a warning sticker. These results continued even when the researchers delayed the contingent reprimands, administered them intermittently, or both.

Stimulus control procedures have also been used as a method for promoting generalization of intervention effects in times or situations when an intervention procedure is not able to be conducted. Research has implemented a response interruption procedure for pica behaviors when in the presence of a signal card (Piazza et al., 1996). Results indicated that the pica behaviors decreased in the presence of the signal card even when the response interruption procedures were not being implemented.

Other research has been able to use discrimination training procedures as a way to signal a change in a contingency during reinforcement based interventions for challenging behavior. There may be times when it is not feasible or possible to deliver functional reinforcers to an individual or the alternative response may occur in an excessive manner. When this happens, the communication response may end up being extinguished and the challenging behavior has the potential to increase if reinforcement is not able to be delivered to the individual for communication responses immediately and on a consistent basis. As a result, it would be beneficial to have procedures that could mitigate these effects. Research has been able to teach individuals to request for functional and alternative reinforcers that are correlated to specific stimuli associated with the functional and alternative reinforcers (Fisher et al., 1998). Results have indicated that challenging behavior has been able to decrease when the functional or alternative

reinforcers were available, and the individuals were able to appropriately request for functional and alternative reinforcers when they were in the presence of the discriminative stimuli that were associated with each. These results indicated that stimulus control procedures were able to be used to manage challenging behavior when the functional reinforcer for the communication response was not able to be delivered.

There are several strengths that are associated with the use of stimulus control procedures. However, one main strength is that stimulus control procedures are able to bring a specific behavior under the control of a consequence based contingency without the requirement of frequent or prolonged contact with the particular contingency. The use of aversive consequences can be reduced by presenting antecedent stimuli that have been correlated previously with different consequences.

Antecedent Interventions for Use with Escape Maintained Behavior

There are several antecedent interventions that have been designed to assist with decreasing challenging behaviors that are maintained by negative reinforcement that is in the form of escape or avoidance of an event. These interventions are important for many reasons. Through evaluation of comprehensive reviews, results indicate that escape from task demands maintains escape behavior for roughly 32% of individuals that engage in severe challenging behavior. This percentage accounts for more than any other contingency (Beavers et al., 2013). Additionally, the antecedents that coincide with escape and avoidance are typically more obvious as well as more available to manipulation than those antecedents that coincide with positively reinforced behavior. Escape maintained behavior is often motivated by the presence of aversive stimulation that appears obvious. On the other hand, positive reinforcement is found to be more motivated by operations that are less apparent like deprivation. Another reason that

antecedent interventions are important is that caregivers or therapists typically control the source of aversive stimulation for an individual (i.e., task demands). Therefore, antecedent approaches that are used in the management of potentially aversive situations can be implemented to prevent occurrences of challenging escape behavior. The antecedent conditions that align with the exhibition of challenging behavior may then be obvious to a caregiver or therapist and more available. As a result, there are several antecedent strategies that can be used and are designed to aid in the reduction of escape maintained behavior.

Elimination of Aversive Stimulation

When evaluating options for treatment interventions for escape maintained behavior, removal of the aversive event that motivates the behavior is often found to be the most direct intervention. Escape maintained behavior occurs as a result of an aversive stimulus and as a result, the removal of this particular stimulus should, in turn, reduce or even eliminate the challenging behavior. While this approach has been shown to be successful and effective, it can often be impractical or an unrealistic approach in certain situations and depending on the severity of the challenging behavior. It is not typically feasible to remove all responsibilities that may be potentially aversive or reduce all requirements of an individual. In a situation with the exhibition of a severe challenging behavior, it may be the most suitable option to remove all problematic or aversive tasks and responsibilities as a method for ensuring the safety of the individual and those around them. These tasks and responsibilities can then be reintroduced when the exhibition of the challenging behavior is at an acceptable level.

Fading in Aversive Stimuli

Aversive events may need to be returned to an individual's environment after they have been initially eliminated. This can be completed through stimulus fading (Pace et al., 1994). When stimuli are gradually and systematically reintroduced into the environment, this process is known as fading. The behavioral processes that coincide with the effectiveness of fading procedures is not completely known. When fading is used with extinction, this may allow the challenging behavior to come in contact with extinction contingencies while also in the presence of an establishing operation that may be weak. Extinction may occur more smoothly as the antecedent stimuli are altered that are motivating the individual's escape behavior. As fading is effective without the use of extinction, repeated exposure of the aversive stimuli may be beneficial to reduce the overall aversiveness of the stimuli. Desensitization is a procedure that has been used as a treatment method for phobias. It is a procedure that provides graduated exposure to specific stimuli that set the occasion for escape or avoidance behavior. The specific mechanism that is responsible for the effectiveness of this procedure is not completely understood.

High-Probability Sequence/Behavioral Momentum

High-probability sequences are another antecedent intervention that can be implemented as a method for reintroducing aversive stimuli into an individual's environment. Several requests that have a high probability of compliance and that do not set the occasion for escape behavior would be delivered prior to the delivery of a low-probability request. A low-probability request is a request that has a low chance of compliance and may set the stage for challenging behavior. With this concept, high-probability requests receive a high density of reinforcement which increases an individual's compliance. This, in turn, results in this class of behavior being resistant to change, compliance being maintained, and escape maintained behavior unlikely to occur when a low-probability request is presented.

Section 1 Personal Reflection

Have you used an antecedent intervention to aid in the reduction of a challenging behavior? If so, which category (i.e., default, function-based) of antecedent interventions did you integrate into your treatment and did you see a reduction in the challenging behavior that was being exhibited?

Section 1 Key Words

Antecedent exercise - engages individuals in various activities that require effort on the part of the individuals such as jogging, walking, weight lifting or even roller skating that are independent of occurrences of challenging behavior

Antecedent intervention - when an event or condition is manipulated that occurs prior to the exhibition of the challenging behavior

Default interventions - interventions that do not require the identification of the variables that establish the condition for and maintain the challenging behavior

Desensitization - procedure that provides graduated exposure to specific stimuli that set the occasion for escape or avoidance behavior

Fading - stimuli are gradually and systematically reintroduced into the environment

Functional reinforcer - consequence that maintains the challenging behavior

Function-based interventions - necessitate that the variables, both antecedents and consequences, that maintain the challenging behavior are identified and that a minimum of one variable/component is directly manipulated within the operant contingency

Habituation - a decrease in responsiveness that occurs to stimuli after the stimuli have been repeatedly presented

High-probability sequence - Several requests that have a high probability of compliance and that do not set the occasion for escape behavior

Low-probability sequence - is a request that has a low chance of compliance and may set the stage for challenging behavior

Matched stimulation - a reinforcer that provides similar sensory stimulation as the challenging behavior

Matching law - relative rates of responding that are among different response options corresponding to relative rates of reinforcement for these response options

Mechanical restraint - use of a device that secures an individual's limbs and body parts such as four-point restraints, arm splints, or even straight jackets

Motivating operation - can alter a consequence and the probability of behavior in that moment that has produced these consequences previously in a temporary manner

Noncontingent reinforcement - the reinforcing consequence for a challenging behavior is provided on a time-based or response-independent schedule

Personal restraint - physically holding onto or securing an individual's body parts as a method or ensuring that the exhibition of challenging behavior cannot occur

Protective equipment - allows the individual that is wearing the equipment to freely engage in movement that is not restricted but does not allow the challenging behavior to produce damage or injury

Response restriction - occurs when an intervention is implemented that physically impedes the occurrence or completion of a challenging behavior

Stimulus control - occurs when an antecedent event, stimulus, or a condition are able to regulate a behavior due to the history of differential consequences when these items are present versus when they are absent

Stimulus specificity - changes in the stimuli that are presented are unpredictable and can disrupt habituation

Section 2: Function-Based Extinction Strategies for Challenging Behavior

The term extinction is known by the discontinuation of reinforcement that is contingent on a response with the effect of this discontinuation resulting in an individual's reduction in responding (Catania, 2007). When designing an extinction program to implement with an individual, it is important to determine the reinforcer that is maintaining the challenging behavior. If this step is not completed first and the reinforcer that is maintaining the challenging behavior is not identified, it will not be possible to implement an extinction procedure. Three functional variations of extinction that exist for challenging behavior include the challenging behavior being maintained by socially mediated positive reinforcement, socially mediated negative reinforcement, and automatic reinforcement.

Functional Variations of Extinction

Extinction of Challenging Behavior Maintained by Socially Mediated Positive Reinforcement

The term positive reinforcement refers to the act of presenting a stimulus that is contingent on the exhibition of a behavior that results in an increase in responding that produces the reinforcer (Catania, 2007). Additionally, the term socially mediated reinforcement refers to another individual delivering a reinforcer (Iwata et al., 1994). The use of extinction may seem like an appropriate intervention to implement for reducing challenging behavior that is being maintained by social positive reinforcement since the reinforcement is being delivered by other individuals. Since other individuals are capable of delivering reinforcement, then it should also go to say that these same individuals can be taught to withhold reinforcement. For example, if a child exhibits challenging behavior in the form of hitting another person when they are provided a toy, extinction would consist of not delivering the toy when the challenging behavior is exhibited. Additionally, if access to attention by someone else functions as positive reinforcement for a challenging behavior (i.e., saying no when a child hits their sibling), then extinction would consist of not providing attention when the challenging behavior is exhibited.

Extinction of Challenging Behavior Maintained by Socially Mediated Negative Reinforcement

The term negative reinforcement refers to the removal of an aversive stimulus that is contingent on the exhibition of a behavior and results in an increase in responding that produces the removal of the aversive stimulus (Catania, 2007). Negative reinforcement can be socially mediated when another person delivers the reinforcement (Iwata et al., 1994). There are several challenging behaviors that are sensitive to negative reinforcement. These challenging behaviors consist

of escape from bite presentations (Bachmeyer et al., 2019), changes that occur within the environment (Fisher et al., 2019), activities that involve self-care (Dowdy et al,, 2018), and social proximity (Vollmer et al., 1998). Review of research in this area has shown that 33-48% of challenging behaviors are sensitive to negative reinforcement (Derby et al., 1992).

Extinction of Challenging Behavior Maintained by Automatic Reinforcement

Automatic reinforcement is reinforcement that is not delivered by another individual and instead the challenging behavior produces reinforcement (Vaughan & Michael, 1982). It is important to understand that automatic reinforcement can be both positive and negative. An example of automatic reinforcement that is positive is when an individual engages in self-injurious behavior (i.e., head banging) which releases endorphins (Sandman & Hook, 1995). An example of automatic reinforcement that is negative is when an individual scratches their arm because they have an itching sensation. Some research has referenced challenging behaviors that are maintained by automatic reinforcement as self-stimulation (Lovaas et al., 1987) or sensory-reinforced behavior (Rincover, 1978). However, the term automatic reinforcement is the most preferred term to use as it refers to behavior that is not socially maintained.

The implementation of extinction procedures on challenging behavior that is maintained by automatic reinforcement may potentially be viewed as being more problematic when compared to the implementation of extinction procedures on behaviors that are maintained by social reinforcement. When an individual's social environment controls socially mediated reinforcement, the environment can then be manipulated as a method for discontinuing the reinforcement. On the other hand, challenging behavior that produces automatic reinforcement is more difficult to control through changes in the individual's environment.

One method that can be used as an approach to extinction of automatically reinforced behavior is sensory extinction. (Rincover et al., 1979). With this approach, the challenging behavior that is producing the reinforcement is what is actually extinguished, not the sensory reinforcement. During this approach, the source of the automatic reinforcement is blocked or terminated. For example, stereotypical object spinning can be reduced by blocking the auditory feedback that is produced by the object through use of a carpet square. Another method that can be used as an approach to extinction of automatically reinforced behavior is response blocking (Saini et al., 2016). Through use of this procedure, the automatic reinforcement that is produced by the response is prevented or blocked. An individual that exhibits eye poking behavior could have their hand blocked by another individual in an effort to reduce occurrence of eye poking behavior.

Response Patterns that are Associated with Extinction

When the delivery of reinforcement is terminated, the frequency, duration, and intensity of a challenging behavior may decrease in occurrence. However, there are also some other response patterns that are associated with the implementation of extinction. These response patterns may be undesirable, and those behavior analysts that are using extinction should be aware of these response patterns and prepare for them as well.

Extinction Burst

An extinction burst is known as a temporary increase in the frequency, duration, and intensity of a response that can potentially occur with the use of extinction (Cooper et al., 2020). This temporary increase in a challenging behavior can be problematic for a couple of reasons. The first reason that this can be problematic is that a temporary increase in the frequency, intensity, or duration of a

challenging behavior can result in greater injury or destruction if the behavior that is exhibited is dangerous. Another reason that this temporary increase can be challenging is because caregivers may be less likely to continue to follow through with an intervention if it results in the exhibited behavior as being worse, even if this is only temporary.

Extinction-Induced Response Variation

Response variation is known as an increased likelihood that a novel or diverse behavior will be exhibited during extinction. For example, if a child is not allowed access to reinforcement after the child has requested the reinforcement, the child may then exhibit an alternative behavior such as crying in an attempt to access the reinforcement. Response variation may result in responses that are desirable and allow for reinforcement of successive approximations of an exhibited behavior. This could then result in new and desired response forms of a behavior.

Extinction-Induced Aggression

Aggression may be exhibited as a result of withholding contingent or noncontingent reinforcement that was previously provided. Additionally, aggression may be exhibited because it is a member of the same functional response class as the behavior that was being exhibited but is now being placed on extinction. If this is true, then aggression may be exhibited by the individual when other challenging behaviors no longer produce reinforcement. Therefore, it is important to understand that when a reinforcement contingency is terminated for less severe forms of behavior, then it may be likely that more intense and severe forms of challenging behavior are exhibited by the individual. It will then be important to protect the client and those involved in implementation of the intervention when an extinction procedure is used.

Extinction-induced Emotional Behavior

Another pattern of responding that is associated with extinction is extinction-induced emotional behavior. This behavior is known as crying, attempting to escape, protesting, and acting upset (Sullivan et al., 1992). Extinction is often found to be correlated with negative emotional responding and physiological measures. Emotional behavior should be noted and viewed as a sign of discomfort. Furthermore, the occurrence of emotional behavior may be associated with acceptability of the treatment and negatively affect the integrity in which the intervention is implemented. Additionally, the stimulus context may be aversive and increase the likelihood that escape or avoidance behavior is exhibited by the individual.

Spontaneous Recovery

The reemergence of a previously extinguished behavior after a period of time away from the environment or context in which extinction was previously implemented is known as spontaneous recovery. It is important to note that if the recovery of the previously extinguished behavior occurs unexpectedly, then it may be assumed that the intervention does not work. It may also not continue to be implemented if this is assumed. Clinicians should be aware that spontaneous recovery of a behavior may occur and an environment may need to be arranged accordingly.

Factors that Influence Extinction

The efficacy of extinction can be influenced by several different factors. Although there may be numerous variables that can affect efficacy, it is important to highlight a few that behavior analysts should be aware of. These include the schedule and parameters associated with reinforcement during baseline, the

availability that exists of alternative reinforcement during the treatment intervention, and stimulus control.

Schedule of Reinforcement during Baseline

The persistence to responding that occurs during extinction is known as resistance to extinction. This is one method that is used to evaluate the effectiveness of extinction. Resistance to extinction has been further defined in research as the responses that are made, the time that has elapsed, or the number of trials that occur until an individual's responding has reached a predetermined extinction criterion (Catania, 2007). A behavior that is maintained on an intermittent reinforcement schedule typically becomes more resistant to extinction than a behavior that has been maintained on a continuous reinforcement schedule (Ferster & Skinner, 1957). Research has shown that the more intermittent that a schedule of reinforcement is, the more resistant the exhibited behavior will be to extinction (Lerman & Iwata, 1996). The influence that an intermittent reinforcement schedule of reinforcement has on a behavior is known as the partial-reinforcement extinction effect.

Baseline Parameters of Reinforcement

There are several baseline parameters of reinforcement that have an impact on an individual's responding during extinction. These parameters include the number of reinforcers that are delivered, the delay that occurs for delivery of reinforcement, and the magnitude of the reinforcement that is delivered to the individual.

Research has shown that the longer the acquisition period or greater the density of delivery of reinforcement before extinction has been implemented, then the more resistant the exhibited behavior will be to extinction (Fisher et al., 2019). Additionally, the effects of the number of reinforcers reach an asymptote to which

a behavior's resistance to extinction will not continue to increase further (Lerman & Iwata, 1996b).

The delay to reinforcement prior to extinction being implemented will also influence the effects of extinction. Challenging behavior can be viewed as being more resistant to extinction when a delay to delivery of reinforcement is unpredictable and variable than when compared to situations where the delay of reinforcement is not existent. On the other hand, responding does not persist as much if the delay in reinforcement delivery is predictable and constant. These findings result in powerful implications for treatment interventions that involve extinction-based procedures. The consequences that are delivered for challenging behavior are often delayed and the length of this particular delay can be variable. These conditions would therefore decrease the efficacy of extinction. Reinforcement should then be delivered on an immediate and continuous schedule in an effort to decrease the effects of reinforcement delay.

Research has shown that when reinforcement magnitude is referenced in terms of amount, then reinforcement magnitudes that are smaller during baseline will result in more resistance to extinction. If reinforcement magnitude is referenced in terms of intensity, then the larger the reinforcement magnitude is during baseline will result in more resistance to extinction. This information is important to understand as the magnitude or intensity of baseline reinforcement, depending on the function that is maintaining the challenging behavior, will influence the challenging behavior's resistance to extinction in some manner. To further emphasize this, challenging behavior that is maintained by access to food may be more resistant to extinction if the behavior is reinforced during baseline with a smaller snack instead of a big meal.

Extinction Combined with Reinforcement

Extinction procedures can be more effective at decreasing challenging behaviors when they are able to be combined with differential or noncontingent reinforcement (Lalli et al., 1997). This is possible for a couple of different reasons. The first reason coincides with the availability of reinforcement. With this, the availability of reinforcement for an alternative behavior should reduce the exhibition of challenging behavior and increase the exhibition of the alternative behavior as this aligns with the principles of matching law (Hernstein, 1974). Matching law infers that the relative rate of a particular response will match the relative rate of reinforcement for that response. In an effort to further explain this, if there are twice as many reinforcers available for challenging behaviors than there are for other behaviors, an individual will exhibit twice as many challenging behaviors than they will other behaviors (Borrero & Vollmer, 2002). Another reason is that failures associated with treatment integrity that occur during extinction alone are also likely to have an effect on a treatment intervention. These failures would then be aligned with an intermittent reinforcement schedule for challenging behavior. On the other hand, these failures may not be as detrimental when extinction is able to be combined with reinforcement if the schedule of reinforcement is sufficiently dense. Even though extinction combined with reinforcement is often more effective than the use of extinction procedures alone, resurgence may occur if the alternative behavior that has been newly acquired and reinforced goes through extinction. Resurgence is a term that refers to the reemergence of a previously extinguished behavior.

Stimulus Control

The change that occurs in the probability of a response that is due to the presence, absence, or change in an antecedent stimulus event is known as stimulus control (Pierce & Cheney, 2013). Stimulus control is found to be

important to extinction procedures during multiple schedules. Multiple schedules are known as compound schedules where different correlated stimuli act to signal two or more alternating component schedules of reinforcement, extinction, or punishment (Ferster & Skinner, 1957). Research has indicated that signaled-extinction schedules are able to produce more immediate suppression of and stimulus control over responding than when compared to extinction schedules that are unsignaled (Fisher et al., 2018; Fuhrman et al., 2016). Research has also indicated that individuals may actually prefer the implementation of interventions that use signaled-extinction and reinforcement schedules instead when compared to interventions with unsignaled-extinction and reinforcement schedules (Tiger et al., 2006).

An example of a form of stimulus control is instructional control. Research has shown that the effects that are associated with extinction are often more rapid when verbal instructions are provided that signal an extinction schedule than when there are no verbal instructions provided (Weiner, 1970). The effects that were documented on extinction when brief verbal instructions were provided are comparable to the effects that were documented on signals that are present during the timeframe of the scheduled component (Tiger et al., 2008).

Practical Considerations

There are a few things that should be considered when implementing extinction interventions. Some of these practical considerations include the use of extinction as a component of a treatment package, the alternative strategies that are available when extinction is not able to be implemented because it is impossible or impractical to use, and the relation that exists between extinction and establishing operations.

Treatment Packages

When developing an intervention, a behavior analyst is likely to combine the use of extinction as an intervention with other procedures, such as differential reinforcement (McCord et al., 2001) or noncontingent reinforcement (Hagopian et al., 2001). The efficacy of extinction can be influenced by various antecedent components such as rules, the modification of establishing operations such as the fading of demands, or even through the use of consequent events other than reinforcement such as the use of punishment.

Alternative Strategies

There are different contexts in which a behavior analyst will be unable to implement extinction with high integrity. This may be due to the implementation of the intervention as being impossible or impractical to use. For example, the use of physical guidance with a person that is bigger than the interventionist may be difficult to follow through with. In situations where it may be difficult to implement extinction procedures, a modification may need to be made. A general approach to a situation like this may be to minimize the reinforcement that is being provided for the challenging behavior and maximize the reinforcement that can be provided for a more alternative and appropriate behavior.

Motivating Operations

An environmental event that changes the reinforcing effectiveness of other events and the likelihood of a response class that has typically produced these events in the past is known as a motivating operation. When a behavior analyst is able to identify the variables that are associated with altering the effectiveness of escape, attention, and automatic reinforcement then extinction as a viable treatment option can be established. As an example, extinction procedures may be inappropriate as a treatment intervention for escape maintained challenging

behavior in a classroom setting if the demands being asked of the child are not suitable for that child's abilities.

Section 2 Personal Reflection

Have you ever implemented an extinction procedure in an effort to reduce a challenging behavior? If so, what are some practical considerations that accounted for and which type of functional variation did you integrate into the intervention?

Section 2 Key Words

Automatic reinforcement - reinforcement that is not delivered by another individual and instead the challenging behavior produces reinforcement

Extinction - discontinuation of reinforcement that is contingent on a response with the effect of this discontinuation resulting in an individual's reduction in responding

Extinction burst - temporary increase in the frequency, duration, and intensity of a response that can potentially occur with the use of extinction

Matching law - the relative rate of a particular response will match the relative rate of reinforcement for that response

Motivating operation - environmental event that changes the reinforcing effectiveness of other events and the likelihood of a response class that has typically produced these events in the past

Multiple schedules - compound schedules where different correlated stimuli act to signal two or more alternating component schedules of reinforcement, extinction, or punishment

Negative reinforcement - the removal of an aversive stimulus that is contingent on the exhibition of a behavior and results in an increase in responding that produces the removal of the aversive stimulus

Partial-reinforcement extinction effect - influence that an intermittent reinforcement schedule of reinforcement has on a behavior

Positive reinforcement - the act of presenting a stimulus that is contingent on the exhibition of a behavior that results in an increase in responding that produces the reinforcer

Resistance to extinction - persistence to responding that occurs during extinction

Response variation - increased likelihood that a novel or diverse behavior will be exhibited during extinction

Resurgence - reemergence of a previously extinguished behavior

Socially mediated reinforcement - another individual delivering a reinforcer

Spontaneous recovery - reemergence of a previously extinguished behavior after a period of time away from the environment or context in which extinction was previously implemented

Stimulus control - change that occurs in the probability of a response that is due to the presence, absence, or change in an antecedent stimulus event

Section 3: Token Economies

The first token-economy program was recognized in the early 1960s and is known as some of the earlier applications of applied behavior analysis (Ferster & Skinner, 1957). Token economies were inspired by the desire to develop an environment that was conducive toward the development of adaptive behaviors for individuals

in an institutionalized setting.

A token economy consists of antecedents, behaviors, and consequences that change or influence behavior through delivery of conditioned reinforcement. Antecedents occur before the exhibition of a behavior that indicate that an individual should exhibit a particular behavior that is specified as part of the token economy. The behavior is the action that is specified within the contingency relation. The consequences are in the form of backup reinforcers and follow the exhibition of the behavior consistently. A main component of a token economy is the delivery of token reinforcers once a specified behavior has occurred. Most of these conditioned reinforcers do not contain inherent value but they provide individuals with an opportunity to exchange them for backup reinforcers. These backup reinforcers could include edibles, special outings, and activities. The main purpose of these tokens and conditioned reinforcers is to bridge the gap between the exhibition of a behavior and the delivery of a backup reinforcer.

There are a few key elements that are common attributes of token economy systems. These systems typically include goals and behaviors that are specified in observable terms, reinforcers and punishers that could be potentially used are identified, the targeted behaviors are monitored frequently and consequences are delivered consistently, a program is developed that is flexible with the ability to change as needs change, and collaboration occurs among all individuals with a formal monitoring system in place to evaluate and maximize effectiveness. The ultimate goal of a token economy system is to strengthen adaptive or desirable behaviors while simultaneously decreasing challenging behaviors. Once the program is successful, though, it should be faded as quickly as possible.

Identification and Definition of Targeted Behavior

When designing a token economy system, the targeted behavior should be identified and clearly defined in objective terms. A behavior that is defined in ambiguous terms or poorly described will lead to misunderstandings and

confusion. This could also lead to inconsistent delivery of reinforcement or even reinforcement for an unintended behavior.

Identification of Conditioned Reinforcers

Conditioned reinforcers (i.e., tokens, buttons, stickers, poker chips) should be selected based on the implementation context. Consideration should also be given if response cost is included in the token economy system. If response cost is used, a conditioned reinforcer that can be easily removed may need to be used (i.e., erasing a point from a whiteboard). Additionally, it is recommended that verbal praise is paired with conditioned reinforcement.

Identification of Backup Reinforcers

A backup reinforcer can be various items, activities, or privileges that an individual can exchange for a conditioned reinforcer (Kazdin, 2001). Backup reinforcers need to have established reinforcing properties, and conditioned reinforcers should be able to be exchanged for a variety of backup reinforcers. This will help to prevent satiation from occurring which can ultimately result in the failure of a token economy system.

Schedule of Reinforcement and Exchange Rate

There are a couple of different ways that the delivery of backup reinforcers can be manipulated in an effort to maximize the effectiveness of a token economy system. One method includes the manipulation of the reinforcement schedule so that the effects of reinforcer satiation are reduced. Typically, continuous reinforcement is implemented in the initial stages of a token economy system as a way for establishing a high rate of behavior. Then, intermittent reinforcement should be delivered based on either a ratio or variable-time schedule. Another method is to manipulate the amount that is needed of the conditioned reinforcer

in order to gain access to the backup reinforcer (i.e., exchange rate). The rate of reinforcement that is used in a token economy system is typically established by measuring the natural rate of the appropriate behavior during baseline sessions so that the individual will be able to contact the reinforcement contingency. Then, the cost of the backup reinforcers is determined and a menu of rewards with a range of backup reinforcers is set.

Maintain Records

Without keeping a record of reinforcers earned or behaviors exhibited, it may be difficult for others to recognize any improvement that may be made by an individual. Therefore, it may prove valuable to create a daily or weekly chart so that a visual record of improvement is available for the individual to reference. When a review is completed of the chart, this allows for others to provide praise and feedback to the individual regarding their progress.

Response Cost

Response cost is known as a negative-punishment procedure that removes a conditioned token reinforcer in a response-contingent manner. Response cost is not used to restrict access to reinforcement as an individual is still able to earn conditioned reinforcers even when they lose a token for a challenging behavior. It is important to determine if response cost should be used in a token economy system. If the challenging behavior is inhibiting the exhibition of the adaptive behavior, then response cost may be beneficial at reducing the exhibition of the challenging behavior.

Include Individuals and Train Staff

A formal explanation of the rules that will be used in the token economy system should be provided to the individuals involved. This allows for everyone involved

to understand how a token is earned, when and where tokens can be exchanged, what a token can be exchanged for, and the cost of backup reinforcers. Additionally, the behaviors that result in the gain or loss of a token should be discussed.

Fading out the Program

It is agreed upon that the best token economy systems are those that are able to be faded out deliberately. There are several techniques that can be used in an effort to reduce an individual's reliance on contingencies as well as promote the generalization and maintenance of a change in behavior. Indiscriminable contingencies may be able to be used. This occurs when the limits of training contingencies are able to be made unclear as well as concealing the point at which a contingency will stop operating. The use of intermittent reinforcement also helps to facilitate generalization as well as increasing the cost of the backup reinforcers or delaying an individual's access to redemption of tokens.

Limitations of Token Economy Systems

There are several limitations of token economy systems. One limitation is the no-cure criticism which is the idea that the effects of the treatment intervention will not remain after the treatment ends or has been removed. Another limitation is regarding the ethical issues that are brought forth due to the imposition of contingencies on individuals that may be viewed as vulnerable. Thirdly, a token economy system may reveal training and resource challenges for the individuals involved, particularly those that administer the token economy system. Additionally, it has been discussed that the failure to consider motivating operations may influence the effectiveness of a contingency management procedure.

Section 3 Personal Reflection

Have you ever implemented a token economy system with an individual in an effort to reduce a challenging behavior or increase the exhibition of an appropriate behavior? If so, what conditioned and backup reinforcers were used and what limitations did you encounter?

Section 3 Key Words

Backup reinforcer - various items, activities, or privileges that an individual can exchange for a conditioned reinforcer

Response cost - negative-punishment procedure that removes a conditioned token reinforcer in a response-contingent manner

Token economy - antecedents, behaviors, and consequences that change or influence behavior through delivery of conditioned reinforcement

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