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Function-Based Reinforcement and Punishment Procedures for Challenging Behaviors

Introduction

When a functional analysis indicates the consequences that maintain an individual's challenging behavior, the behavior analyst can then alter those consequences in such a manner as to decrease the occurrence of the challenging behavior and increase a more appropriate and alternative response. There are several procedures that are based on either reinforcement or punishment that are effective for use in the treatment of challenging behaviors. Therefore, it is necessary that a behavior analyst determine the consequences that are maintaining a challenging behavior and select an appropriate intervention for use as a treatment option.

A behavior analyst will need to be able to determine whether function-based reinforcement or punishment procedure is necessary to integrate into treatment based on the challenging behavior that is being exhibited. Therefore, it is necessary that a behavior analyst be informed of treatment options available to them and the items that should be considered when selecting a procedure for implementation.

In this course, participants will learn to (1) identify different function-based reinforcement procedures for use with challenging behaviors, (2) identify different function-based punishment procedures for use with challenging behaviors, and (3) discuss how function-based procedures should be selected for implementation.

Section 1: Function-based Reinforcement Procedures for Challenging Behaviors

A functional analysis can reveal that social consequences are maintaining the occurrence of an individual's challenging behavior. When a behavior analyst is aware that these are the consequences that are maintaining a behavior, then the

behavior analyst can alter those specific consequences in a manner that decreases the occurrence of the challenging behavior and increases the exhibition of a more appropriate and alternative behavior (Fisher et al., 1993). In this situation, a behavior analyst can teach the individual that engages in a challenging behavior that is being reinforced through attention from others to gain access to attention through a communication response that is more appropriate. For example, functional communication training can be integrated into the individual's treatment (Carr & Durand, 1985). Even if a functional analysis reveals that the consequences that are being automatically produced by the challenging behavior function as reinforcement, a behavior analyst can manipulate alternative reinforcement procedures in different avenues so that the challenging behavior decreases even when it continues to produce the reinforcement automatically (Piazza et al., 1998). Therefore, it is important to consider the operant mechanisms that are responsible for the effectiveness of different function-based reinforcement procedures as well as evaluating the various outcomes of functional analyses and how the results of these analyses can be used to develop reinforcement-based treatments for challenging behaviors that are effective.

Operant Mechanisms within Treatments that are Function-based

There are three operant mechanisms that are related to the function of the challenging behavior that a behavior analyst should integrate into the implementation of a functional analysis (Iwata et al., 1994). The first component that is highlighted within a functional analysis condition is that of a discriminative stimulus. Each functional analysis condition has a minimum of one antecedent stimulus that corresponds to and signals a specified reinforcer for the challenging behavior as it occurs in that condition. Research has indicated that by correlating the different functional analysis conditions with salient, discriminative stimuli (i.e., a specific colored room), this can work to improve the efficiency and clarity of a

functional analysis (Conners et al., 2000). More rapid treatment effects may also be associated with aligning baseline and treatment conditions with unique and salient discriminative stimuli.

The second component of a functional analysis that is highlighted is its motivating operation (Laraway et al., 2003). A motivating operation may increase or decrease an individual's motivation for a specific reinforcer (i.e., skipping breakfast increases motivation for having lunch). Another effect of a motivating operation is to either increase or decrease the likelihood of responses that have produced the specific reinforcer previously (i.e., driving through a drive-thru is more likely after skipping breakfast). An establishing operation is considered a motivating operation that increases an individual's motivation for a certain reinforcer (Peterson et al., 2016) while an abolishing operation is a motivating operation that decreases an individual's motivation (Laraway et al., 2003). It is important to understand how establishing operations work and can influence the likelihood of challenging behavior during a functional analysis. This is important to understand when a behavior analyst assesses the function of a challenging behavior as well as when an effective treatment needs to be developed. This implies that a behavior analyst can manipulate an establishing operation so that the likelihood of a challenging behavior increases during a functional analysis in ways that allow for a decrease in its likelihood when treatment is implemented.

The third component of a functional analysis that is highlighted is its reinforcing consequence. A specific consequence is delivered after the occurrence of a challenging behavior in each test condition of a functional analysis. This delivery of consequences is also implemented on a dense schedule. One advantage that is associated with delivering consequences after the occurrence of a challenging behavior in this manner is that the contingency should be strong and salient (Vollmer et al., 2001). This should lead to a clearer result. Additionally, another advantage associated with this delivery method is that response rates are typically

lower under a fixed rate (FR) 1 schedule than when an intermittent schedule is used. This may reduce the risks that are associated with the occurrence of severe self-injurious behaviors or aggression. Lastly, another advantage to this method is that decreases in challenging behavior may occur more quickly if extinction is a component of the individual's treatment (Lerman et al., 1996).

Treatments for Responses Maintained by Social Positive Reinforcement

Research has indicated that social positive reinforcement maintains a multitude of challenging behaviors including self-injurious behaviors, aggression, and property destruction (Beavers et al., 2013). As individuals within the environment interact and provide a reaction to a challenging behavior, this response may inadvertently act as positive reinforcement. Function-based treatments that are implemented for challenging behaviors that are maintained by social positive reinforcement typically manipulate a minimum of one of the aforementioned components of a functional analysis. Therefore, it is important to begin the process of determining a function-based treatment after a functional analysis has been conducted and the reinforcer for the challenging behavior has been identified. This can be done by asking questions as they relate to the three previously mentioned components:

- How can discriminative stimuli be arranged so that they signal that reinforcement is available for the exhibition of the alternative behavior at an acceptable time as well as the unavailability of reinforcement when challenging behavior is exhibited?
- How can motivating operations that are relevant to the exhibition of the challenging behavior be altered so that a reduction in the likelihood of the exhibition of challenging behavior and an increase in the likelihood of appropriate behavior occurs?

- How can the reinforcement contingency be manipulated so that there is a reduction in the exhibition of the challenging behavior and an increase in the occurrence of the appropriate behavior?

These questions are able to be used to help guide a behavior analyst in the development of two fairly common treatment interventions for challenging behaviors that are reinforced by social positive reinforcement. These two interventions are functional-communication training (FCT) and noncontingent reinforcement (NCR).

Functional-Communication Training (FCT)

FCT has typically been viewed as manipulating the consequence for the challenging behavior through use of two different methods. In the first method, the behavior analyst will deliver the consequence that the functional analysis has identified as the reinforcer for the challenging behavior contingent on a response that is an appropriate communicative response. The second method involves the behavior analyst withholding the delivery of the consequence contingent on the exhibition of the challenging behavior. For example, if the functional analysis reveals that contingent attention is reinforcing the exhibition of the challenging behavior, then the behavior analyst will teach the individual to gain access to attention through means of a communication response that is appropriate and that the challenging behavior will no longer produce any attention.

The first part of this intervention is an important aspect as the delivery of a functional reinforcer that is contingent on an appropriate communication response will allow the individual to acquire frequent reinforcement through this communication response. By providing reinforcement to the individual for an appropriate communication response, this minimizes the time that the individual is deprived of attention which can ultimately act as an establishing operation for the exhibition of challenging behavior (Lerman & Iwata, 1995). The other

component is also important because the exhibition of the challenging behavior will become less likely if extinction is being implemented and the challenging behavior no longer produces any attention.

There are several guidelines that should be followed when a behavior analyst selects and trains the FCT response. The selected response should be simple for the individual to exhibit and be able to be recognized by other members within the environment. A response that is already in the individual's repertoire is preferred to be used when compared to a response that is not in the individual's repertoire. A short request can be an acceptable FCT response (i.e., "Answer me, please") for those individuals that have the ability to speak in a complete sentence or can reliably imitate a vocal response. For those individuals that are not able to speak or cannot imitate a vocal response, then the individual can be taught to touch a picture that represents the functional reinforcer. If the individual is unable to emit the FCT response independently, then physical guidance can be used to help select the functional reinforcer and then reinforcement can be delivered. Exposure to the establishing operation is reduced when reinforcement is delivered even if the individual needs assistance to complete the response. This also decreases the likelihood that challenging behavior will be exhibited while training is occurring. As time progresses, the physical prompts can be systematically faded until the individual is able to emit the desired response independently. Lastly, the reinforcer that was identified during the functional analysis is delivered immediately and after the occurrence of each FCT response.

Time-based Delivery of Reinforcement

A second reinforcement-based method that can be used in the treatment of challenging behavior is to deliver the functional reinforcer through use of a time-based schedule (Fisher et al., 2004). This method is commonly referred to as NCR; however, this term has been criticized within the field because the effects of this

intervention result in a reduction and weakening of a challenging behavior when reinforcement is defined as an increase in responding due to contingent positive or negative reinforcement. Therefore, the term fixed-time schedule was recommended. However, this term does not reflect the previous functional relation that exists between a challenging behavior and the stimulus that is delivered through use of a time-based schedule during implementation of treatment or that the results from the functional analysis were used to determine the treatment method used.

Often, the stimulus that reinforced the challenging behavior previously is delivered through means of a dense schedule when a NCR schedule is initially implemented. The delivery of this stimulus on a dense, time-based schedule typically results in a lessening of the establishing operation for the challenging behavior. This can then have the effect of an immediate and large reduction in response rates. Research has shown that while a dense schedule produces reductions in challenging behavior that are large and immediate, a leaner schedule will produce reductions that are smaller and less consistent (Hagopian et al., 1994). Research has also demonstrated similar differences when using larger and smaller magnitudes of reinforcement through means of a time-based schedule, even when NCR is implemented without the use of extinction procedures (Roscoe et al., 2003).

The Choice between FCT and NCR

The implementation of FCT and NCR result in effective treatments for the reduction of challenging behaviors, particularly if these treatments are combined with extinction or a mild form of punishment (Hagopian et al., 1998). NCR may be a better alternative if the risk of harm is high for the individual as FCT requires an initial training period while NCR does not require this. The implementation of NCR also requires less monitoring of the individual's ongoing behavior than FCT

does. For example, reinforcement is delivered on a time-based schedule when implementing NCR. On the other hand, the individual's FCT response should be monitored and responded to during FCT. It is also important to determine if establishing a communication response solely is an important goal for the individual. If this is the main goal, then FCT will be the preferred choice of treatment interventions. FCT may also be preferred over NCR when the amount of reinforcement that will be needed to reduce or eliminate the establishing operation for the challenging behavior is not clear.

Treatment for Responses Maintained by Social Negative Reinforcement

Negative reinforcement has been defined as an increase in responding as a result of the removal of a stimulus that is contingent on a specific response. There have been conflicting views that have resulted as this definition has emerged. Researchers have argued that reinforcement should be viewed as an increase in responding as a result of a change in one stimulus condition to another. This viewpoint is based on the idea that a behavior analyst may find it difficult to determine whether an individual is responding as a way of ending one event in an effort to gain access to the opposite event in different situations. Other researchers, though, have stated that the distinction between both positive and negative reinforcement is helpful and that this terminology is so ingrained within behavior analysts that removal of this distinction is not warranted (Iwata, 2006).

This differing opinion is important to recognize because behavior analysts should be aware that the field disagrees on whether or not there should be a distinction between positive and negative reinforcement and if that distinction is meaningful. Regardless of one's viewpoint, an agreement can be made that results in highlighting the importance of considering, describing, and analyzing the stimulus

conditions that are in effect prior to and after the occurrence of a targeted response.

The Choice between FCT and NCR

Both FCT and NCR are acceptable and appropriate treatment interventions for challenging behavior that is maintained by escape from demands or other aversive events. The concerns and considerations that were previously discussed are also applicable to challenging behavior that is negatively reinforced. When challenging behavior is maintained by escape, behavior analysts will teach the individual to request a break as their FCT response. Escape can also be delivered on a dense, time-based schedule when NCR is selected as a treatment intervention. Often, though, FCT or NCR are combined with extinction.

A limitation that exists that is common to both FCT and NCR is that an individual with challenging behavior that is negatively reinforced will often escape all or at least most of the demands that are placed upon them during initial treatment. Therefore, the individual will not benefit from being provided instructions or learning a new skill (Fisher et al., 1993). One method that can be used to address this problem is by engaging in demand or instructional fading. This approach gradually increases the number of demands that are presented. Another method used for reducing challenging behaviors is by presenting instructions and then delivering differential reinforcement to the individual for complying with the instruction rather than for communication.

Several advantages exist when compliance as the alternative response in differential reinforcement of alternative behavior is chosen as the intervention. One advantage is that the individual will continue to receive different instructions or demands and be more likely to achieve a goal or skill that results in a source of reinforcement for them. Another advantage is that the continued exposure to the instructions or demands may result in habituation which may end up making the

additional presentation less aversive for the individual. Third, the effectiveness of escape extinction can be enhanced through differential reinforcement of compliance. Research has shown that reinforcement of compliance can increase response rates and decrease challenging behavior even if the consequences for the challenging behavior remain the same (Parrish et al., 1986).

Additional Thoughts

An additional method that can be used to treat negatively reinforced challenging behavior is implementation of positive reinforcement when the individual complies with a task or demand. Research has shown that by reinforcing compliance through use of a preferred food, compliance can increase, and negatively reinforced challenging behavior can decrease (Lalli et al., 1999). Differential reinforcement of compliance with tasks or demands can be helpful particularly when escape extinction is rather challenging to implement.

There are two potential operant mechanisms that may be influencing the effectiveness of differential reinforcement of compliance when used as a treatment method for negatively reinforced challenging behavior. One potential solution is that the individual has a preference of receiving positive reinforcement instead of negative reinforcement. The other possibility is that highly preferred positive reinforcement acts as an abolishing operation. This ultimately lessens the effectiveness of escape as reinforcement for exhibition of a challenging behavior.

Lastly, there are other methods of manipulating motivating operations as a way of treating challenging behaviors that are reinforced by escape. Research has shown that escape-reinforced self-injurious behavior is more likely to occur when presented with novel tasks, if the duration of sessions were longer, and if demands are presented at a higher rate (Smith et al., 1995). There are also other variables that can be used to establish the effectiveness of escape as reinforcement for challenging behavior. These variables include difficult tasks,

tasks that are less preferred, the cancellation of a planned and preferred activity prior to the beginning of a session, and sleep deprivation (O'Reilly, 1995). On the other hand, these establishing operations can also be reversed in an effort to abolish or lessen the effectiveness of escape as negative reinforcement for challenging behavior. This can be done through interspersing tasks that are less aversive, gradually increasing the rate of tasks or the level of aversiveness of tasks, and allowing choices among different tasks (Romaniuk et al., 2002).

Treatment for Responses Maintained by Automatic Reinforcement

There are some challenging behaviors that are exhibited at high rates when in the absence of social consequences. These behaviors can be exhibited when an individual is alone yet the consequences that the challenging behavior automatically produces are able to maintain the response. The term automatic reinforcement is used to reference a response that produces a consequence that is favorable automatically, and this consequence then increases the likelihood of a future occurrence of that response (Skinner, 1953). Some of these behaviors may include rocking, hand flapping, or lining up objects.

Often, challenging behaviors that are maintained by consequences that are automatically produced by the response are difficult for behavior analysts to provide treatment for as a behavior analyst may not be able to control for the consequences that are occurring. The exhibition of eye poking is an example of a challenging behavior that may be maintained by automatic reinforcement. Potentially, a hypothesis as it coincides with the function of this behavior could be that it produces a visual sensation that serves as reinforcement for an individual that is deprived of this sensation or stimulation. However, it is difficult for a behavior analyst to be able to test whether or not this hypothesized automatic

consequence is the functional reinforcer for this challenging behavior as it cannot be manipulated during a functional analysis.

A treatment method that can be implemented is through providing the individual with an alternative form of stimulation that is appropriate and that can compete with the automatic reinforcer for the challenging behavior (Piazza et al., 1998). Research has shown that an enriched environment, one with added manipulables, could increase adaptive behavior with the manipulables and decrease the exhibition of self-injurious behavior as well as stereotypical behavior (Horner, 1980). This specific research used an intervention that was not based on a functional analysis, however.

As time progressed, additional research further evaluated this treatment method and refined its approach by basing the implementation of an enriched environment on the results of a functional analysis and selecting stimuli based on the results of a preference assessment for use in the enriched environment (Fisher et al., 1992). This approach was then further refined through development of a preference assessment that identified preferred stimuli that aligned with high levels of interaction and low levels of challenging behavior (Piazza et al., 1998). This preference assessment is known as a competing-stimulus assessment. This assessment is preferable for use for identifying preferred stimuli for reinforcement-based treatment for challenging behavior that is maintained by automatic reinforcement as well as social positive reinforcement (Fisher et al., 2000).

The competing-stimulus assessment involves several short sessions that are around two minutes each. A single competing stimulus is presented in each session, and the individual is able to interact with the stimulus, exhibit the automatically reinforced challenging behavior, or engage in both. The person observing will record any interaction with the stimulus as well as exhibition of the

challenging behavior as a method for identifying one or more stimuli that are associated with high levels of interaction and low levels of challenging behavior. The behavior analyst will then use this identified stimulus by presenting it to the individual on a time-based schedule when the automatically reinforced challenging behavior is likely to be exhibited and when alternative stimulation is not available.

Section 1 Personal Reflection

Have you ever used FCT as a treatment intervention? If so, what are some difficulties that you experienced when implementing this intervention? Would you have changed anything as a result of these difficulties?

Section 1 Key Words

Abolishing operation - a motivating operation that decreases an individual's motivation for a certain reinforcer

Competing-stimulus assessment - preference assessment that identified preferred stimuli that aligned with high levels of interaction and low levels of challenging behavior

Establishing operation - a motivating operation that increases an individual's motivation for a certain reinforcer

Motivating operation - may increase or decrease an individual's motivation for a specific reinforcer

Section 2: Function-based Punishment Procedures for Challenging Behavior

There are several interventions that have been developed that are based on the process of punishment and are effective at treating challenging behaviors. Positive punishment is described as the contingent presentation of a stimulus that decreases the future probability of a behavior. Some different variations of positive punishment include verbal reprimands, restraint, and delivery of demands. Negative punishment, on the other hand, can be described as the contingent removal of a stimulus that decreases the future probability of a behavior. Negative punishment can be implemented through two different procedures such as response cost and time out. Response cost refers to the contingent removal of a specified amount of a positive reinforcer (i.e., tally marks), and time out refers to the contingent loss of access to a reinforcer for a specified amount of time.

The implementation of punishment has been considered controversial over the past several years, and a decrease in the use of these procedures has been attributed to the advancements that have been made in the functional analysis of challenging behaviors and use of function-based treatment options. Although these advancements have occurred, punishment still remains a viable treatment option for individuals with severe forms of challenging behavior. Punishment may prove useful when a behavior analyst is unable to identify or control the reinforcers that are maintaining challenging behaviors (Fisher et al., 1993) or when function-based treatments are unable to produce the outcomes that are desired or acceptable (Fisher et al., 1993). Additionally, punishment may be a worthwhile treatment option for life-threatening behaviors that need a rapid decrease in exhibition in order to prevent physical harm to an individual (Foxx, 2003).

Variations of Punishment Procedures

Punishment may be a preferred treatment option if interventions that are based on reinforcement, extinction, and establishing operations are unable to produce results that are clinically acceptable or if the challenging behavior requires immediate intervention that will produce rapid decreases in exhibition. Punishment procedures can be divided into two primary groups: positive punishment group and negative punishment group. The positive punishment group includes procedures that include the presentation of an aversive stimulus that is contingent on behavior while the negative punishment group includes procedures that include the removal of reinforcing stimuli contingent on behavior.

Positive Punishment Procedures

Verbal Reprimands

Statements that are brief and disapproving may serve as an effective punisher for various challenging behaviors such as self-injurious behaviors, aggression, rumination, and stereotypy. Research has shown that a stern "No," delivered contingent on challenging behavior may reduce the occurrence of the behavior (Dominquez et al., 2014). Verbal reprimands can be viewed as being more effective when they are paired with eye contact and physical contact, when the individual that is implementing the reprimand is physically near the targeted individual, and when the reprimands are made contingent on the exhibition of challenging behavior of other people (Richman et al., 2001).

Response Blocking and Physical Restraint

Response blocking is referred to as the implementation of brief physical contact in an effort to prevent a response from occurring. This is the least intrusive of these procedures. Research has shown that blocking hand mouthing by placing a hand a small distance from the individual's mouth was effective at reducing the

behavior (Lerman & Iwata, 1996). The reductive effects of response blocking may be a result of extinction rather than punishment in some situations, though (Smith et al., 1999).

Physical restraint refers to restricting or limiting an individual's ability to move. Research has shown that there are different methods of restraint that can be used to reduce challenging behaviors effectively. Some of these methods include hands down where the individual's hands are held to the side or in their lap for a period of time (Bitgood et al., 1980), baskethold which means a therapist stands behind the individual and crosses the arms of the individual across their chest and holds their wrists for a period of time (Fisher et al., 1994), and movement suppression time out where the therapist utilizes the least amount of physical contact required to keep the individual from moving while they stand in a corner (Rolider & Van Houten, 1985).

Overcorrection and Various Forms of Contingent Effort

There are different forms of punishment that require the individual to engage in a response that is effortful after they have exhibited the challenging behavior. This form of punishment is known as overcorrection, particularly if the response that is contingent on the challenging behavior is topographically like the challenging behavior or related to it in some other manner. Overcorrection contains two components that can either be implemented alone or in combination. This depends on the exhibition of the challenging behavior. Restitutional overcorrection requires the individual that exhibited the challenging behavior to restore the environment to a better state than what it was in its original state if the challenging behavior caused a disruption in the environment. Positive-practice overcorrection requires the individual to practice an appropriate and related behavior over and over again. Research has shown that overcorrection

has produced effects that are inconsistent, with increases, decreases, or no change occurring with the challenging behavior (Peters & Thompson, 2013).

Other procedures that are used that are not categorized as overcorrection include contingent demands where individuals are required to complete tasks that are not related to the challenging behavior (Fischer & Nehs, 1978), negative practice where the individual is required to exhibit the challenging behavior over and over again (Azrin et al., 1980), and contingent exercise where the individual is required to perform motor movements that are not related to the challenging behavior (Kahng et al., 2001). Response interruption and redirection is another intervention that is used typically to decrease the exhibition of vocal stereotypy (Ahearn et al., 2007). This procedure provides the individual with questions or instructions that require a vocal response as an answer that is contingent on the exhibition of challenging behavior. These questions are continued until the individual responds with three correct responses without the exhibition of vocal stereotypy.

Negative Punishment Procedures

Time Out from Positive Reinforcement

Time out is known as a common form of punishment where loss of access to positive reinforcers occurs or loss of the opportunity to earn positive reinforcers occurs contingent on the exhibition of the challenging behavior. An individual may be moved to a less reinforcing environment (i.e., exclusionary time out, seclusionary time out) or by discontinuing the reinforcement within the environment that the individual is currently in (i.e., nonexclusionary time out).

Response Cost

The removal of a specified amount of a reinforcer can often be used as an effective punisher. Typically, most research has been conducted on response cost

as it is applicable to token-economy systems. However, individuals can also lose other reinforcers through response cost such as books, money, or participation in activities. Little research, though, has been conducted to evaluate the methods that can be used to determine the most appropriate type and amount of reinforcers that should be removed in a response cost intervention.

Selection of Punishment Procedures

Behavior analysts are ethically obligated to ensure that the least restrictive procedure is to be used that is clinically effective. Punishment procedures should be arranged hierarchically as it relates to the degree of restrictiveness, intrusiveness, or aversiveness that is inflicted upon the individual as a form of reference when selecting an intervention from this category. Often, nonexclusionary time out and response cost are considered the least restrictive procedures followed by exclusionary time out, overcorrection, and other physical punishers. This should be used to guide selection of interventions for treatment.

However, despite this information, applying this model may raise ethical concerns. A hierarchical system may be used on a trial basis by starting with the least restrictive procedure and moving to a more restrictive procedure until an effective intervention can be identified. If one intervention is not found to be effective, then a clinician may try a more restrictive procedure, increase time spent in time out, and continue to evaluate increasingly restrictive procedures until one can be identified as effective.

This can end up being a time-consuming process and provide the individual with prolonged exposure to several different intrusive procedures. There is no empirical support that a more restrictive procedure will have better success than a less restrictive procedure. This hierarchical approach highlights the topography of an intervention instead of focusing on its function. It also does not consider that

an intrusive procedure may also function as a punisher or a reinforcer depending on the individual. Several factors should be considered when deciding whether or not to use a punishment procedure. These factors include how immediate the effects are, how relevant the procedure is to the behavioral function, how severe the exhibition of the challenging behavior is, and the willingness of those involved to use the procedure.

Using Punishment Effectively

Research has shown that some of the methods that have been used to implement punishment can ultimately undermine the effectiveness of these interventions. A reduction in a challenging behavior may not occur if the consequence is delayed, intermittent, somewhat mild, paired with reinforcement for the challenging behavior, or if punishment reduces the amount of reinforcement that the individual receives.

Punishing every occurrence of a challenging behavior may not be practical in most situations, particularly if the response rate is high. However, it may be possible to thin the schedule of punishment gradually after a significant reduction has occurred in the exhibition of the challenging behavior. Punishment may also be more effective when an individual can obtain the maintaining reinforcer for the challenging behavior or reinforcers that are highly substitutable for the functional reinforcer through a variety of sources that are contingent and independent of responding.

Section 2 Personal Reflection

Have you ever implemented a punishment procedure previously as a method for reducing a challenging behavior? Were other interventions attempted prior to the

punishment procedure? What impact did the punishment procedure have on the individual's behavior?

Section 2 Key Words

Negative punishment - the contingent removal of a stimulus that decreases the future probability of a behavior

Positive punishment - the contingent presentation of a stimulus that decreases the future probability of a behavior

Response cost - the contingent removal of a specified amount of a positive reinforcer

Time out - the contingent loss of access to a reinforcer for a specified amount of time

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