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Noncompliance

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Abstract

Among challenging behavior, noncompliance has the unique characteristic of describing the failure to engage in, or the absence of, a specific behavior (i.e., compliance). Recognizing that the term “compliance” has negative connotations for many, we propose an alternative term, “cooperation”, to describe the behavior expected of children with autism who exhibit noncompliance. This chapter initially reviews the functional behavior assessment of noncompliance using indirect assessment, direct assessment, and functional analysis. Next, we examine antecedent and consequent interventions for active cooperation (i.e., following an instruction to complete a task), such as implementing the high-probability request sequence, reducing response effort, manipulating the delivery of instructions, and providing reinforcement. The third section focuses on interventions designed for passive cooperation (e.g., tolerating a medical device, remaining in the presence of a feared stimulus), which include exposure, noncontingent reinforcement, differential reinforcement of other behavior, and escape extinction. Overall, this chapter provides an overview of research and practices to support individuals who contend with noncompliance in children with autism.

Keywords: autism, compliance, cooperation, noncompliance

Noncompliance

According to the Meriem-Webster dictionary (n.d.), the term noncompliance describes a “failure or refusal to comply with something (such as a rule or regulation).” For example, a child may fail to follow the instructions to finish an academic task from a teacher or to complete a request from a caregiver. Researchers also use the term to refer to the failure to adhere to medical and dental procedures or instructions (e.g., Kleinsinger, 2003; Kupzyk et al., 2021; Kupzyk & Allen, 2019). In itself, noncompliance is not a behavior, but rather the absence of an expected response (i.e., the failure to comply). That said, children may engage in challenging behavior such as verbal protests, screaming, or aggression as a part of noncompliance. The initial instruction, rule, or expectation encompasses a specific stimulus condition that evokes the onset of behavior (Lambert et al., 2017). Such stimulus conditions may have aversive properties that create a state leading to noncompliance. Within this context, the absence of behavior is problematic because compliance may enhance health, social development, education, and well-being.

The problem of child noncompliance has long been investigated by researchers and clinical professionals across fields. Kalb and Loeber (2003) describe persistent noncompliance demonstrated by children across various settings and with various adults to have deleterious effects. The inability to adhere to explicit rules or expectations may create: (a) ongoing negative interactions with the adults in their lives impacting the quality of that relationship, (b) barriers accessing structured activities (e.g., sports, games) and social events with friends, (c) difficulties in making or keeping friendships with children who are generally cooperative, (d) impediments in the acquisition of academic skills, and (e) vulnerabilities to physical safety and well-being. Kalb and Loeber further report that repertoires of noncompliance commonly persist from childhood into adolescence, creating greater risks for the negative impacts of noncompliance observed in youth, such as delinquency, aggression, and violence. Moreover, Feldman (2007) showed that noncompliance in toddlers may be an early indicator of adolescents who do not develop empathy skills.

Reports on the prevalence of noncompliance vary depending on the setting and source of data. For example, cross-sectional studies have reported that noncompliance affects 25% to 65% of children whereas a single nine-year longitudinal population-based study estimated a prevalence of noncompliance in the range of 3% to 12% in boys after adjusting for their at-risk status (Kalb & Loeber, 2003). Unsurprisingly, the prevalence of noncompliance is reported to be much higher for children referred to clinics, which ranged from 65% to 92%, when compared to nonclinical population samples with a range of 10% to 57% (Achenbach & Edelbrock, 1981; Kalb & Loeber, 2003). More recently, a study using formal school discipline reports found noncompliance for 25% to 37% of students in the 2011-2012 school year across 10 states (Losinski et al., 2017). One aspect that has been highly consistent across studies is the finding that children with autism spectrum disorders have shown higher levels of noncompliance and fewer improvements in developing compliant or cooperative skills compared to their non-autistic peers. Thus, children with autism are at greater risk for the adverse outcomes associated with noncompliance (Bryce & Jahromi, 2013; Ekas et al., 2017).

As noncompliance involves the failure to comply, practitioners and researchers often directly target compliance for intervention when addressing behaviors described as noncompliance (e.g., Dufour & Lanovaz, 2020; Wilder et al., 2020). Despite the common use of the term “compliance” in the scientific literature (i.e., behavioral, medical), the lay interpretation of this term connotes subservience (Brunton, 2017; Vermeire et al., 2001). Nevertheless, compliance is an essential component of intervening with children with autism. Interventions may or may not always involve the preference of individuals if that person is not able to make reasonable judgements that positively affect their well-being. A person with limited capacity, intellectually or developmentally, may select behaviors that could have profound negative impacts on their life.

For example, a young child, regardless of diagnosis, may select ice cream rather than vegetables as part of their dinner, or choose not to brush their teeth daily, if at all. Young children do not yet have the skills to make informed and rational decisions about the entirety of their treatment or be able to fully consent (Morris, Conway, & Goetz, 2021). The inability to be fully involved in their own treatment is further compounded when the behavior of concern is noncompliance or when the individual has a developmental disability that affects their comprehension of the nature, benefits, or drawbacks of an intervention. As an alternative to *compliance*, we propose the term *cooperation*, which conveys working toward a mutual goal: the benefit of the child. This terminology shift addresses the longstanding concern of behavior analysts with addressing behaviors that lead to outcomes which are socially important (Baer et al., 1968), that support habilitation and that preserve the dignity of the individuals served (Bannerman et al., 1990; Favell et al., 1984; Leaf et al., 2021; Van Houten et al., 1988). As with compliance, cooperation involves engaging in an expected behavior under specific stimulus situations (Donaldson et al., 2014; Lambert et al., 2017).

In behavior analysis, noncompliance is conceptualized in terms of antecedents (stimuli or events that precede noncompliance), behavior (topographies of compliance), and consequences (stimuli or events that maintain noncompliance). Antecedents and consequences are the environmental factors that are responsible for the occurrence of noncompliance. As such, a caregiver, teacher, or clinical professional may manipulate antecedents and consequences to prevent or attenuate ongoing noncompliance. Note that antecedents may also involve factors related to a person's internal state (e.g., feeling of anxiety, hormonal state, fatigue), which behavior analysts refer to as motivating operations. Guided by a professional in behavior analysis, caregivers and other practitioners (e.g., teachers, behavior technicians) will measure and collect data on the topography of noncompliant and cooperative behavior, so that the relevant antecedents and consequences may be identified. The professional will then consider and recommend intervention options that may involve systematic changes to antecedents, consequences, or both. The main goal of treatments for noncompliance is to systematically reframe a situation so that the same stimulus or event that historically leads to noncompliance instead evokes cooperation. The purpose of this chapter is to review these assessments and behavioral interventions to support active and passive cooperation in children with autism.

Functional Assessment

Regardless of the type of cooperation, practitioners typically conduct a functional behavior assessment prior to intervening with children with autism. Functional behavior assessment involves the identification of the environmental variables that maintain challenging behavior. Specifically, the assessment provides information about the antecedents and consequences that influence behavior. Behavior analysts use this information to develop a treatment that directly addresses the function of behavior. Because functional behavior assessment was designed to assess challenging behavior, the assessment generally targets the function of noncompliance (rather than cooperation). Topographically, noncompliance may look like the child is escaping from a task, an instruction or an aversive stimulus (e.g., medical device) that is presented by a caregiver, teacher or other professional, but assuming an escape function poses a major issue for treatment. Misunderstanding the functions of behavior may lead to interventions that are contraindicated (Donaldson & Austin, 2017; Rodriguez et al., 2010).

For example, assume that a behavior analyst prescribes a time-out procedure for every instance that a child is not following specific instructions, but that noncompliance is in fact maintained by social negative reinforcement in the form of escape. We would consider this intervention as being contraindicated. Time-out is unlikely to produce the desired behavior change because the child's noncompliance will continue to be reinforced by escape. In contrast, this same intervention would most likely reduce noncompliance maintained by attention. In another example, an intervention involving the delivery of attention is less likely to be effective for the treatment of noncompliance if a child's noncompliance is reinforced by social positive reinforcement in the form of attention. Some studies have even found that access to tangibles may maintain noncompliance (Majdalany et al., 2017; Wilder, Harris et al., 2007). To address these issues, researchers and practitioners should systematically employ functional behavior assessment to individualize treatments.

Behavior analysts may conceptualize noncompliance as a skill deficit, as insufficient reinforcement, or as a lack of motivation (see motivating operations; Laraway et al., 2003; Majdalany et al., 2017). As such, interventions will differ depending on the variables influencing noncompliance. The function-based treatment will involve eliminating or minimizing the reinforcer for noncompliance and allocating reinforcers for appropriate behavior. The three types of functional assessments are: (a) indirect assessment, (b) direct assessment, and (c) functional analysis.

Indirect Assessment

Generally, an indirect assessment is conducted first to gather information about the behavior and the immediate environment. The primary methods of an indirect assessment are structured interviews, questionnaires, rating scales, and checklists (Durand & Crimmins, 1988; Hanley et al., 2014; Iwata et al., 2013; Matson et al., 2012). The purpose of using an indirect assessment is to develop an initial hypothesis about the antecedents and consequences that are related to the challenging behavior. Oftentimes, the tools used to gather information rely on verbal reports from the caregivers or teachers. In other words, the behavior of interest is not directly observed by the behavior analyst when conducting an indirect assessment. Indirect assessments have been used to hypothesize about the potential functions of noncompliance (Crowther et al., 1981; Keenan et al., 1998). Indirect assessments provide useful information and are easy to implement, but relying on data obtained from informants has some disadvantages. Some researchers have reported low reliability and validity of indirect assessment tools (Fagot & Leve, 1998; Iwata et al., 2013; Sturmey, 1994). Additionally, the information obtained from an indirect assessment are highly subjective because they are based on informant recall. Given these limitations, behavior analysts should strongly consider using other types of functional assessment in combination with indirect assessments to identify functions of noncompliance that will lead to a function-based intervention.

Direct Assessment

Direct assessments involve observing the target behavior in the environment in which it occurs such that relevant information related to the antecedents and consequences are recorded. When observing, the behavior analyst records the events that precede and follow noncompliance (Freeman et al., 2000; Lipschultz & Wilder, 2017a). Unstructured observations involve a behavior analyst observing the child’s behavior as it would occur naturally in the environment

(Ndoro et al., 2006). During structured observation, the behavior analyst may ask a caregiver to deliver an instruction that has a history of evoking noncompliance and observe the child's behavior in the natural environment (Stephenson & Hanley, 2010). The environment is arranged in such a way that will make noncompliance more likely, but no consequences are programmed in this situation. Researchers have assessed several methods of data collection and analysis such as narrative recording, conditional probabilities, and scatterplot to identify the relationship between behavior and environmental events with mixed findings (Anderson & Long, 2002; Call et al., 2017; Lanovaz et al., 2013; Miltenberger et al., 2019; Thompson & Iwata, 2007). Similar to indirect assessments methods, direct assessments alone do not identify causal relations. Nevertheless, behavior analysts may ascertain a strong hypothesis from well-designed indirect and direct assessments, which can then inform the treatment for noncompliance.

Functional Analysis

A functional analysis (sometimes referred to as an experimental analysis or a functional assessment with analog conditions) involves the systematic manipulation of antecedents and consequences to identify a functional relation between environmental events and behavior (Iwata, Dorsey, et al., 1994). Functional analyses consist of at least one test condition wherein a reinforcer is delivered contingent on challenging behavior and one control condition wherein a reinforcer is available on an independent time-based schedule (noncontingently, Iwata & Dozier, 2008). If the target behavior is higher in one or more test conditions relative to the control condition, the experimenter may draw conclusions about a functional relation. The functional analysis methodology has been adapted to a variety of topographies such as aggression, self-injurious behavior, and property destruction (see Beavers et al., 2013).

Relative to other topographies of challenging behavior, few studies have evaluated functional analysis procedures for noncompliance (Lloyd et al., 2017; Majdalany et al., 2017; Rodriguez et al., 2010; Wilder, Zonneveld et al., 2007). Conducting a functional analysis for topographies of challenging behavior that involve escaping a stimulus condition with known aversive properties may be inefficient and lead to unnecessary exposure to contrived conditions that evoke challenging behaviors. That said, researchers have employed escape baseline conditions to test the function of behavior (Cook et al., 2015; Dowdy et al., 2013; Dufour & Lanovaz, 2020; Richling et al., 2011). For example, Schumacher and Rapp (2011) arranged a baseline condition to measure escape responses by placing scissors within proximity to the child's head and scoring the number of responses. The number of escape responses occurred at a higher level than the sitting response. The use of a baseline condition that tests escape responses provides important information upon which an intervention can be developed. Nonetheless, researchers and practitioners should remain cautious when limiting their analysis to an escape condition. Some studies that experimentally evaluated environmental variables using noncompliance as the target behavior have found that it may be also be sensitive to positive reinforcement contingencies (Majadalany et al., 2017; McKerchar & Abby, 2012; Rodriguez et al., 2010; Wilder, Zonneveld et al., 2007).

Another option for identifying potent reinforcers that may be related to maintaining noncompliance when a functional analysis is not viable to conduct a concurrent operant assessment (Berg et al., 2007; Finkel et al., 2003; Robinson et al., 2019). For example, Robinson et al. (2019) used a concurrent operant assessment to identify both preferences and putative maintaining reinforcers for five adolescents to increase cooperative skills related to household chores and hygiene tasks. The researchers used the highest ranked choice across three possible choices that each participant could allocate their time to in a free-operant condition. Using 5-min assessment sessions, the researchers arranged a room with two tables, each consisting of one the three choices, which were alternated within and across sessions for at least nine sessions. The choices consisted of adult interaction, tangible engagement (e.g., computer) and escape from working. Next, the reinforcer used for the cooperation intervention corresponded to the participant's most frequent choice from the assessment (i.e., computer access, adult interaction, escape coupon). All participants increased completion of requested tasks to 100% and improved their latencies to task initiation. Using a concurrent operant assessment may identify the function of behavior when evoking noncompliance is not possible or impractical (Berg et al., 2007), and may also identify effective reinforcers to increase cooperation.

Summary and Practice Recommendations for the Functional Assessment of Noncompliance

Functional analyses have shown noncompliance to be maintained by escape from tasks or instructions (e.g., Briggs et al., 2019; McKerchar & Abby, 2012; Newman et al., 2021), access to attention from others (e.g., Rodriguez et al., 2010), access to items (e.g., Brown et al., 2020), continued access to items or activities (e.g., Majdalany et al., 2017; Wilder, Harris et al., 2007), and combinations thereof (e.g., Lloyd et al., 2017; Randall et al., 2018; Reimers et al., 1988). At this point, the reader should not that research has mainly focused on noncompliance associated to active cooperation (e.g., following instructions), but that these methodologies may also be adapted for passive cooperation (e.g., wearing a medical device). Because functions of noncompliance are idiosyncratic (e.g., Fulton et al., 2020; Wilder, Zonneveld et al., 2007), methods selected for teaching children cooperative behavior may vary. If noncompliance is not excessive, overly disruptive, or dangerous, bolstering best practice guidelines for instructional methods within a classroom (e.g., Donaldson & Austin, 2017) and at home (LaBrot et al., 2020; Morris, Conway, & Goetz, 2021), or formally implementing other evidenced-based antecedent methods (i.e., high-probability instructional sequences; Lonsinski et al., 2017; Radley & Dart, 2016), could improve cooperative responding without the need to conduct a functional analysis (Lipschultz & Wilder, 2017a).

Active Cooperation

Active cooperation occurs when a behavior is evoked by a specific request, instruction or prompt, engagement is initiated within a certain period of time (e.g., 10 s), and the requested behavior is carried out to completion. The onset of active cooperation occurs in response to a "demand" of some sort provided by an authority figure, such as a caregiver or teacher. For example, the adult may provide instructions to engage in an academic task (e.g., "point to the dog's tail", "complete this worksheet"), or an activity of daily living (e.g., "brush your teeth," "fold the laundry"). These skills are important to daily functioning and may serve as behavioral cusps for other repertoires. Children who follow simple instructions are more likely to (a) succeed in learning academic tasks and persist when they become challenging, (b) perform independent living skills necessary for health, hygiene, and relationships, and (c) engage in social contracts which provide opportunities for friendships, community events, and paying jobs (Bishop et al, 2013; Feldman, 2007; Kalb & Loeber, 2003). The prior observation is not to suggest that a child cannot reasonably refuse to follow a specific request, but children should cooperate with most requests in home and school settings. Active cooperation may also occur in the form of a response to a peer (e.g., "come play on the swings with me", "can I use your pail and shovel?"), which is essential for the social development of children with autism.

In practice, behavior analytic interventions often involve multi-component treatment packages, which capitalize on the benefits of several interventions and result in the most robust effects (Bellipanni et al., 2013; Fischetti et al., 2012; Randall et al., 2018; Wilder et al., 2020). These multi-component interventions usually include both antecedent and consequent components. To facilitate the review of each component, what follows is a description of various interventions within each of these two categories (i.e., antecedent and consequent interventions).

Antecedent Interventions

Antecedent interventions involve environmental manipulations that can attenuate persistent challenging behavior via prevention (Donaldson & Austin, 2017; Radley & Dart, 2016; Wood et al., 2018). By manipulating discriminative stimuli or motivating operations, behavior analysts may delay, or even prevent, the onset of noncompliance (Cooper et al., 2020; Miltenberger, 2016). With antecedent interventions, the reinforcer that maintains noncompliance (e.g., attention, tangibles, escape) is available independently of the occurrence of noncompliance or cooperation, and the potency of the reinforcer is diminished so that it does not necessitate noncompliance from the child’s perspective (e.g., academic tasks are made easier or more engaging so that escape from tasks is no longer as valuable). In short, multiple opportunities are systematically arranged for children to freely or easily contact preferred items and activities (including maintaining reinforcers), while the likelihood of contacting aversive scenarios are minimized. From an ethical standpoint, this type of arrangement is considered a least-restrictive intervention for a first-line approach (Behavior Analyst Certification Board, 2014).

High-Probability Instructional Sequence

Researchers consider the high-probability instructional sequence (HPIS) as an evidenced-based intervention for children with autism (Brosh et al., 2018). The HPIS is the most researched, and sometimes identified as the most efficacious, intervention for promoting child cooperation (Lonsinski et al., 2017; Radley & Dart, 2016). During the HPIS, the caregiver or teacher delivers a series of instructions in quick succession that have a high probability (high-*p*) of producing immediate cooperation, followed by a single instruction that has a low probability (low-*p*) to evoke cooperation (Mace et al., 1988). The HPIS procedure is derived from behavioral momentum theory (Nevin, 1996), which posits that low-probability (low-*p*) behaviors are more likely to occur following a series of high-probability (high-*p*) behaviors that produce a high rate of reinforcement. In turn, the resulting state of behavioral persistence creates resistance to disrupters that occasion behavior change.

Regardless of assertions questioning the role of behavioral momentum as the primary mechanism responsible for the effects of HPIS procedures (e.g., King et al., 2021; Nevin, 1996), studies have shown that reinforcement plays a central role in the success of HPIS procedures (Pitts & Dymond, 2012; Wilder et al., 2015; Zuluaga & Normand, 2008). For instance, Wilder et al. (2015) used a reversal design across two experiments demonstrating that cooperation from two participants resulted from HPIS when edible reinforcement followed the high-*p* instructions. The researchers did not observe the same results when reinforcement was not delivered for cooperation with the high-*p* instructions or when only low-quality reinforcement (i.e., praise) was provided. The latter observation is especially important because praise is a common reinforcer during HPIS procedures, but it may reduce the effectiveness of the HPIS if it is considered as a low-quality reinforcer for a child. As such, practitioners should conduct brief preference assessments with the child (e.g., Call et al., 2012; Carr et al., 2000) to identify stimuli likely to function as reinforcers prior to intervention. Because the intervals between each instruction delivery should be brief in the HPIS (see below), practitioners should prioritize reinforcers with a brief "consumption" period (e.g., small edible, bubbles, tickles, stickers). Alternatively, practitioners may use a cumulative reinforcer system (e.g., collecting pieces for a preferred puzzle, tokens for a larger or longer back-up reinforcer) when secondary reinforcers have been empirically validated as an effective intervention for the child.

As with reinforcers, the type of instructions used for the low-*p* and high-*p* categories should be assessed and validated before they are used in the HPIS procedure (e.g., Belfiore et al., 2008; Ducharme & Worling, 1994; Ertel et al., 2019). Some examples of instructions that may be categorized as high-*p* may include "close the door," "point to the window," or "show me your eyes," while low-*p* instructions may consist of "put your toy in the toybox," "push in your chair," or "hang up your coat." A high-*p* instruction for one child may serve as a low-*p* instruction for another child, which underlines the importance of conducting an individualized assessment beforehand.

Initially, the professional compiles a list of potential high-*p* and low-*p* instructions by providing an open-ended interview (Ertel et al, 2019) or a checklist of options (Ducharme & Worling, 1994) to adults who typically present instructions to the child. A caregiver or teacher presents the requests to the child in a few assessment sessions across days in a random order until each instruction has been presented for a total of 10 trials. The presentation of several instructions should incorporate a minimum intertrial interval (e.g., 60 sec.; Ducharme & Worling, 1994), and can be in a naturally occurring context relevant to the instruction (Belfiore et al., 2008; Ducharme & Worling, 1994). High-*p* instructions involve those with which the child cooperates within 10 s for 80% or more trials. By contrast, low-*p* instructions are those with which the child cooperates 40% or less of presentations. Instructions that fall between these two percentages are not used. Even though a "medium-probability" instructional sequence (MPIS) has been shown to be effective (Romano & Roll, 2000) and is sometimes recommended (e.g., Cook et al., 2019; Issarraras & Matson, 2020), practitioners should wait for further replications prior to adopting this approach.

Some other considerations for effective HPIS implementation include the ratio of high-*p* to low-*p* instructions and the intertrial interval used between high-*p* instructions. While many researchers recommend a 3:1 ratio of high-*p* to low-*p* instructions, others have found 5:1 and 1:1 ratios to be effective, though some involved fading procedures (Ertel et al., 2019). Behavioral momentum theory suggests that a higher rate of reinforcement produces a larger behavioral mass and more behavioral momentum. Hence, a higher number of high-*p* instructions for each low-*p* instruction may produce larger behavior changes. For example, Ertel et al. (2019) examined the use of 1:1, 3:1 and 5:1 ratios, and found that 5:1 ratios were the most effective at producing cooperative responding. Lastly, effective implementation of a HPIS procedure requires a brief intertrial interval (i.e., the time between the onset of one trial to the onset of the subsequent trial). Researchers have often used a 10-s intertrial interval (Bullock & Normand, 2006), but more recent studies have indicated that shorter intervals (1 to 5 s) may be more effective (Pitts & Dymond, 2012, Wilder et al., 2015).

Noncontingent Reinforcement

Noncontingent reinforcement (NCR) involves the noncontingent delivery of a preferred item (often stimuli that function as maintaining reinforcers) on a fixed- or variable-time schedule. The caregiver or teacher delivers the preferred item regardless of the occurrence of noncompliance or cooperation. The independent delivery of reinforcers is thought to function as an abolishing operation for noncompliance. For example, if noncompliance is maintained by attention, an adult may provide attention (e.g., “that’s great coloring, Gabriela!”) on a fixed-schedule (e.g., every 3 min). Besides decreasing the likelihood of challenging or disruptive behavior, NCR may also provide an overall enhanced environment for the child. For instance, some children engage in attention-seeking behavior because they have been deprived of adult interactions for a period of time, which may be especially true for children with autism. Adults tend to allocate their time to children who are engaging in disruptive behavior and spend less time interacting with those who are playing or working “nicely.” To this end, studies have shown that providing noncontingent interaction or access to tangibles is an effective strategy for preventing persistent challenging behavior (Carr et al., 2009; Ingvarsson et al., 2008).

Likewise, noncontingent escape (NCE) involves providing more frequent breaks for escape-maintained behavior before an establishing operation (or “the need”) for a break becomes apparent via noncompliance (e.g., Coleman & Holmes, 1998; Kodak et al., 2003a). Some studies have used NCE to effectively reduce noncompliance, but NCR with positive reinforcers tends to be a common intervention for noncompliance including instances when an escape function has been identified. Notably, Kodak et al. (2003b) found that NCE was ineffective for escape-maintained noncompliance, but when a second functional analysis determined the function was multiply controlled (escape and attention), the intervention was modified to NCE plus NCR using positive reinforcement resulting in a decrease in noncompliance and an increase in cooperation. These results suggest that a synthesized treatment may be required for multiply-controlled behavior. Given that NCE was ineffective as a stand-alone treatment, another option may be that only NCR with attention was necessary to achieve the same effects.

In another example, Ingvarsson (2008) found that NCR with positive reinforcers effectively decreased multiply-controlled noncompliance and increased cooperation. Moreover, NCR with positive reinforcers has been shown to be an effective strategy to reduce escape-maintained noncompliance and increase cooperation (e.g., Newman et al., 2021; Lomas et al., 2010). Taken together, these results indicate that NCR with positive reinforcement may be an effective intervention for children, regardless of the maintaining function of noncompliance. As with any intervention using preferences or reinforcers, practitioners should empirically identify preferred items or activities using a preference assessment (e.g., Call et al. 2012; Robinson et al., 2019), or conduct a functional assessment to confirm the maintaining reinforcers (e.g., Briggs et al., 2019; Brown et al., 2020) to produce optimal treatment effects.

A handful of studies have used noncontingent reinforcement in the form of pretrial access to directly target active cooperative responding as the primary dependent variable (Bullock & Normand, 2006; Hodges et al., 2021; Normand & Beaulieu; 2011). Noncontingent access to preferred items was provided *prior to* a trial issuing a low-*p* instruction. Bullock and Normand (2006) and Normand and Beaulieu (2011) showed increases in active cooperation for all instructions across all participants, except for one type of instruction for one participant, which involved relinquishing a video game. In a follow up study, Lipschultz et al. (2017) were unable to replicate the results of pretrial access and HPIS intervention for two participants. Ultimately, contingent access to a highly preferred edible was required to improve cooperation with low-*p* instructions. More recently, Hodges et al. (2021) evaluated pretrial access for seven children, and found it to be an effective intervention when pretrial access was given at a higher magnitude of preferred items (5 edibles) for four children and a longer duration (3 min of iPad or toy access) for three children. Interestingly, the baseline conditions of the prior studies show that a reinforcement contingency alone was ineffective at increasing cooperation, and pretrial access to preferred stimuli clearly evoked cooperative responding. This observation is notable because providing response-dependent access may be preferable to other strategies for evoking cooperation, such as prompting, which may be aversive and evoke other challenging behavior. Unfortunately, the authors of these studies did not take data on challenging behavior, which may have provided more insight into this potential benefit of pretrial access to reinforcers.

Reducing Response Effort

In contrast with NCR that produces an abolishing operation, reducing response effort may set an establishing operation to engage in cooperation by making the cooperative response less effortful to engage in. For example, Fischetti et al. (2012) reduced the response effort for three children to put their toy away in a bin by increasing the proximity of the bin to the child when they presented the instruction. The reduction of response effort alone increased cooperation for only one child, but those effects did not maintain as the task became more difficult (i.e., distance increased). However, the addition of edible reinforcement was sufficient to maintain cooperation as effort increased. For another participant, a guided compliance procedure (described in the consequences section) with edible reinforcement was required whereas guided compliance without the additional edible was effective for the third child.

In a similar study, Wilder et al. (2013) initially reduced response effort by decreasing the distance to a toy bin for two children, but they also provided an edible contingent on cooperation. That is, the researchers did not assess the reduction of response effort alone. The distance of the toy bin was systematically increased until it was 3 m away, and both children cooperated with instructions without any challenging behavior. The researchers also initially reduced effort for a third child without using an edible, but they found edible reinforcement was eventually required for higher levels of cooperation and low-to-no engagement in challenging behavior. Relinquishing preferred items by putting them in a toy bin may be a more difficult request to cooperate with (e.g., Normand & Beaulieu, 2011), perhaps due to the competing motivating variables. The success of a simple response effort reduction procedure combined with edible reinforcement is a surprising result. Across both studies (Fischetti et al., 2012; Wilder et al., 2013), four of the six children did not require the implementation of extinction or response guidance. Overall, response effort manipulations may be advantageous to include when targeting active cooperation for increase, especially when cooperation involves giving up a preferred item.

Manipulating the Delivery of Instructions

Researchers have extensively examined different dimensions of instruction delivery on child behavior, which are provided by the caregiver or practitioner. Notably, studies have manipulated the form of instruction (e.g., Bouxsein et al., 2008; Ducharme & Worling, 1994; Houlihan & Jones, 1990; Neef et al., 1983; Peyton et al, 2005), the schedule of instruction (Bakula et al., 2015; DeLeon et al., 2014; Fulton et al., 2020), the required requisite responses for instruction (Hamlet et al., 1984; Stephenson & Hanley, 2010), the presence of advanced warnings (e.g., "2 min until …"; Cote et al., 2005; Wilder et al., 2010; Wilder, Zonneveld et al., 2007), and the inclusion of rationales for cooperation (Wilder et al., 2010; Wilder et al., 2012). Although the latter two strategies have been commonly recommended in parenting books (Lipschultz & Wilder, 2017b), research findings do not support these strategies as effective (e.g., Cote et al., 2005; Wilder et al., 2010; Wilder et al, 2012; Wilder, Zonneveld et al., 2007). General recommendations such as these often suggest there is a lack of "understanding" on the child's part. The issue is that these solutions tend to overlook the function of behavior, which is idiosyncratic across children with autism who display noncompliance (Waters et al., 2009).

Similarly, several recommendations and treatment packages include descriptions about the form of instruction. Some evidence suggests that form of instruction can influence cooperative responding. For instance, one-step directive instructions (e.g., "please put your toys in the toy box”) are usually more effective in evoking cooperation than ambiguous or multi-step instructions (e.g., “wow, it’s messy in here, there are toys in the playroom and the living room!”; Bouxsein et al., 2008; Peyton et al., 2005). Moreover, “do” and “don’t” instructions appear to belong to different response classes because effective interventions that increase cooperation with one type of instruction (e.g., “come to the table” as a “do” request) does not systematically generalize to the other (e.g., “stop jumping on the couch” as a “don’t” request; Neef et al. 1983; Houlihan & Jones, 1990). For some children, framing “don’t” requests as “do” requests may produce more meaningful changes in behavior (e.g., “sit down on the couch” vs. “stop jumping on the couch”; Ducharme & Worling, 1994). Other accompanying strategies to simple directive statements are to ensure that the adult is in close proximity to the child and obtains eye contact prior to the delivery of the instruction (e.g., Hamlet et al., 1984; Stephenson & Hanley, 2010). The combination of providing directive one-step instructions with a quiet-toned voice and in close proximity, establishing eye contact, and waiting 5 to 10 s for cooperation are antecedent components in a treatment package known as effective instruction delivery. The package also involves the consequent component of praising cooperation, relying on both antecedent and consequent interventions. This intervention package is commonly used in classrooms (e.g., Bellipanni et al., 2013; Mandal et al., 2000) and is sometimes taught as a general strategy for caregivers (e.g., LaBrot et al., 2020).

Finally, the research literature strongly supports considerations in the schedule of instructional periods, which is directly related to the use of accumulated versus distributed reinforcement (Bakula et al., 2015; DeLeon et al., 2014; Fulton et al., 2020). Distributed reinforcement involves briefer periods of reinforcement that are provided frequently for cooperation (dense schedules) whereas accumulated reinforcement occurs after longer working periods but prolonged access to reinforcement is provided (yoked to the total access duration in the distributed condition). The latter condition provides a leaner schedule of reinforcement with longer work periods. Studies have nearly consistently shown that accumulated reinforcement results in better cooperative responding and lower levels of challenging behavior (e.g., Fulton et al., 2020). Furthermore, most participants selected the accumulated reinforcement condition as their most preferred. In short, the tradeoff for longer working periods is receiving a higher magnitude of reinforcement. When considering the period of instruction delivery, caregivers and teachers may benefit from assessing the ratio of instruction periods to reinforcement periods. A noteworthy consideration is the skill level and history of the child, which may alter the effectiveness of using longer periods of instruction for accumulated reinforcement.

Overall, HPIS and NCR have both been identified as evidenced-based interventions (e.g., Brosh et al., 2018; Carr et al., 2009; Losinski et al., 2017; Radley & Dart, 2016), and effective instruction delivery has some support as an intervention, but there has not been consensus on its status as an evidenced-based treatment (Losinski et al., 2017; Radley & Dart, 2016). Given their nonaversive nature, these interventions should be considered as one of the first line approaches for caregivers and practitioners to use to increase child cooperation and decrease noncompliant behavior.

Consequent Interventions

Despite the relative benefits of an antecedent-only strategy, consequences are frequently required to obtain the most effective intervention effects. One approach is to begin with a practical and less restrictive intervention using antecedent strategies, and then to monitor the effects to determine if consequent interventions should be considered. If antecedent interventions are moderately effective or the behavior change does not persist, practitioners may add consequent components (e.g., Newman et al., 2021; Wilder, Zonneveld et al., 2007). If the antecedent intervention is ineffective, an alternative may involve taking a consequent-only approach (e.g., Fischetti et al., 2012; Lipschultz et al., 2017). To this end, many consequent procedures are beneficial on their own, and those that involve the provision of positive reinforcers (e.g., DRA) may also be considered least restrictive. Consequent interventions are designed to directly address response-reinforcer (i.e., causal) relationships. Below is a description of several consequent strategies used to decrease noncompliance and promote active cooperative responding.

Guided Compliance

Guided compliance procedures to increase active cooperation typically involve a 3-step process contingent on noncompliance, with each step progressively more intrusive (e.g., Wilder & Atwell, 2006). For the first step, the caregiver or teacher provides an instruction, which is followed by praise provided contingent on cooperation within 10 s. If the child does not comply, the caregiver or teacher re-presents the instruction and models the cooperative response (step 2). If cooperation occurs within 10 s, the child receives praise. If noncompliance persists, the caregiver or teacher physically guides the child to engage in the cooperative response using hand-over-hand prompting (step 3). Several mechanisms may explain why guided compliance effectively increases active cooperation (Tarbox et al., 2007; Wilder et al., 2012; Wilder et al., 2020; Wilder & Atwell, 2006), including extinction (preventing escape from the requirement to cooperate), punishment (applying an aversive consequence contingent on noncompliance), and negative reinforcement (avoidance of repeated instructions and physical prompts to cooperate). A disadvantage to guided compliance is that some of the above mechanisms involve a seemingly aversive aspect. Nevertheless, guided compliance provides an instructional component for correct behavior.

Recently, Wilder et al. (2020) incorporated a highly preferred edible into the guided compliance procedure as a less aversive option. In this version of guided compliance, the caregiver or teacher presents a preferred edible by holding it up as the initial instruction is presented. Contingent on cooperation with the instruction within 10 s, the child received the edible. Wilder et al. (2020) used this procedure for instructions that were particularly difficult (relinquishing an iPad) for two boys. Interventions that involved only a preferred edible for cooperation (without the guided compliance procedure) or guided compliance for noncompliance (using praise for the initial instruction) were both ineffective. Only the combination of these interventions resulted in cooperation from both boys. Caregivers and practitioners should consider the incorporation of a highly preferred item if they chose a guided compliance procedure. To obtain best treatment outcomes, the practitioner should empirically identify the highly preferred item using a preference assessment (e.g., Call et al., 2012; Carr et al., 2000).

Differential Reinforcement of Alternative Behavior

Differential reinforcement of alternative behavior (DRA) involves providing reinforcement for one response while implementing extinction (i.e., withholding the maintaining reinforcer) for the undesirable response (e.g., Vollmer & Iwata, 1992; Miltenberger, 2016; Cooper et al., 2020). When used systematically as a procedure to reallocate responding for cooperation, only the cooperative response obtains the maintaining reinforcer while noncompliance is placed on extinction (i.e., never contacts the reinforcer). Through response reallocation, the cooperation replaces noncompliance. The type of extinction for noncompliance depends on the function of behavior, as identified in a functional analysis. If noncompliance is maintained by escape from instructions, extinction usually involves prompting follow through with the request (e.g., guided compliance procedure) that does not allow escape from the instruction.

However, studies have long evaluated the exclusion of escape extinction (e.g., Lalli et al., 1999; Piazza et al., 1997), and more recently, researchers have suggested refinements for this broad definition for DRA (Vollmer et al., 2020). Using DRA without an extinction component for teaching cooperation involves providing reinforcement for cooperative behavior, but also permitting the child to escape the demand by not requiring follow through (and not commenting on noncompliance) or allowing continued access to the item or activity if the child was asked to relinquish access. Studies have shown that DRA interventions designed to improve cooperative responding and reduce challenging behavior without the inclusion of an extinction component may be effective (e.g., Briggs et al., 2019; Carter, 2010; Majdalany et al., 2017; Slocum & Vollmer, 2015, Wilder, Harris, et al., 2007).

Behavior analysts may decide to use a DRA procedure without extinction in cases when extinction evokes aggression as well dangerous or high-intensity behavior, is difficult or impractical to implement (e.g., large size of child or adolescent), or when allowing escape may be a primary means for the child to opt out in contexts where assent is a reasonable expectation (e.g., Morris, Detrick, & Peterson, 2021; Rajaraman et al., 2021). These benefits must be weighed against the risks of excluding extinction, including ineffective outcomes (e.g., Newman et al., 2021; Wilder, 2020) or having positive treatment effects prone to relapse (e.g., Briggs et al., 2019; Brown et al., 2020). Vollmer et al. (2020) proposed that both the definition and the procedure of DRA should incorporate the use of minimizing reinforcement rather than the exclusive use of extinction for challenging behavior. Adjusting the relative value of reinforcement for cooperation over the competing noncompliance response can be effective at mitigating relapse concerns (Brown et al., 2020). The differential rate, quality, magnitude, and duration may have an impact on cooperation (Fulton et al., 2020; Rogalski et al., 2020).

In essence, the relative value of reinforcement for cooperation should outweigh the aversive aspects (Rogalski et al., 2020). Reinforcement rate, quality, magnitude, and or duration needs to be “worth it” before consistent cooperation may be observed. The type of reinforcement may play a role as well. As with NCR, positive reinforcement can be effective to increase cooperation and decrease noncompliance that is maintained by escape (Briggs et al., 2019; Carter, 2010; Payne & Dozier, 2013; Slocum & Vollmer, 2015), and this may be due in part to the child’s preference for this type of reinforcement (Gardner et al., 2009; Kodak et al., 2007; Lomas et al., 2010).

Timeout

Timeout is the removal of the child from an enriched environment, usually consisting of preferred items, activities, and attention (i.e., “time in”). Time out should be brief (e.g., 2 min) and may be exclusionary or nonexclusionary (Miltenberger, 2016). Exclusionary timeout involves removal from the time-in room into another room that has no reinforcement or preferred stimulation. Nonexclusionary timeout occurs within the same space as time-in. For example, a teacher may implement nonexclusionary timeout by seating the child in a chair in the corner of the classroom where time-in items, activities, and interactions can be observed but not accessed. A common example is a hockey player being seated in a penalty box during a hockey game. For time out to be effective, the child must prefer the time-in setting, and the function of noncompliance should involve access to the attention, items and activities that are available in that context. For example, Rortvedt and Miltenberger (1994) effectively used timeout for two children whose noncompliance was maintained by attention. Noncompliance is often maintained by escape, at least in part due to the presentation of an instruction as the onset of noncompliance; therefore, caution should be used that timeout does not serve to reinforce noncompliance (e.g., Iwata, Pace, et al., 1994). As timeout is considered a more restrictive procedure, we recommend only implementing it when other less restrictive strategies have failed or when the child must be removed from the immediate environment for their own safety or that of others around them. For timeout to be effective, a functional analysis should be conducted, ongoing data collected on cooperation and noncompliance, and the effects should be carefully monitored.

Summary and Practice Recommendations for Active Cooperation

The prior section outlined several antecedent and consequent strategies that may be used in isolation or in combination to promote active cooperation and reduce noncompliance. The nuances of these interventions are complex and rooted in decades of research, which oftentimes requires an experienced Board Certified Behavior Analyst to supervise implementation. That said, some of the antecedent interventions such as effective instruction delivery are clearly described, easy to learn, and practical to implement (e.g., Bellipanni et al., 2013; LaBrot et al., 2020; Morris, Conway, & Goetz, 2021). Additionally, learning to focus on, and importantly, provide reinforcers for cooperative responses can be critical to caregivers and teachers achieving success with increasing cooperation. Wood et al. (2018) provided practice guidelines for evidenced-based antecedent strategies, and Donaldson and Austin (2017) outlined several broad strategies, which focus on the antecedent and consequent provision of reinforcers. As described above, both NCR and DRA using positive reinforcers can be effective interventions even when the function of behavior is escape. The crucial aspect for this universal approach is the use of potent reinforcers. If time and resources are limited, allocating effort to identifying preference using relevant assessments may be more important than a functional analysis. Both are indicated when possible, especially when behavior is frequent, persistent, and poses a risk to the child or others.

Passive Cooperation

Passive cooperation involves the omission of behavior during specific conditions. Oftentimes, passive cooperation entails sitting still or tolerating an event by not engaging in a removal behavior (Cook et al., 2015; Rapp, 2012; 2013). In contrast to active cooperation wherein the child is taught to engage in behavior in response to a specific stimulus, the child learns to tolerate an aversive situation in passive cooperation. Children may emit active responses during passive cooperation procedures, but the outcome is the omission of behavior during specific contexts. In many cases, the context is deemed aversive such that the child has a history of engaging in escape or avoidance behaviors. Teaching passive cooperation is critical because the unpleasant events are important for the child's well-being and overall adaptive functioning. An example of passive cooperation is when a child is at the pediatrician's office for a blood draw, and they abstain from engaging in escape behavior. That is, the child sits still during the procedure. In this example, the child does not engage in challenging behaviors such as running away or removing their arm, rather they remain seated and allow a medical professional to insert a needle into their arm. Passive cooperation is critical for teaching children to tolerate events related to their medical well-being (e.g., dental exam), general health (e.g., wearing eyeglasses), safety (e.g., wearing a seatbelt), and daily routines (e.g., riding an escalator). This section will include a discussion of four broad categories of stimulus situations that have been the focus of passive cooperation research. The four categories are: feared stimuli, medical and dental procedures, hygiene routines, and prolonged tactile contact.

Categories of Stimuli Associated with Passive Cooperation

Feared Stimuli

The category for feared stimuli refers to specific stimuli or events that elicit autonomic nervous system arousal (a physiological response that prepares the body for a fight or flight response; Miltenberger, 2016), in turn evoking an escape or avoidance response. Fear responses can be conceptualized as behaviors that develop through respondent events (Allen & Kupzyk, 2016; Miltenberger, 2016). For instance, an unconditioned stimulus such as loud barking from a dog may elicit an unconditioned response in the form of autonomic nervous system arousal (e.g., startle response with increased muscle tension and heart rate). The previously neutral stimulus (the dog) which had no history of evoking fear for the person then becomes conditioned through the process of respondent conditioning. This response may serve as an establishing operation for immediate avoidance or escape operant behavior (Miltenberger, 2016), such as crying (to get picked up) or running away from the dog, which are strengthened each time they occur and reinforcement is provided in the form of escape or avoidance.

Within the field of psychiatry, persistent fear responses to specific stimuli which disrupt the daily functioning of a person are known as specific phobias (American Psychiatric Association, 2013). Specific phobias are typically treated with systematic desensitization procedures using visualization, hierarchies and relaxation training while the effects are measured using self-report (Miltenberger, 2016). Behavior analysts are likely to approach phobias with in-vivo desensitization, or a similar variation. This approach focuses on operational definitions and objective measurement of the fear response (and or an alternative adaptive response) in the presence of the feared stimulus, rather than using self-report. This approach is especially useful for individuals who struggle in communicating their internal feelings, such as children diagnosed with autism or related disorders (Shabani & Fisher, 2006). Behavior analytic research has demonstrated that children can be taught passive cooperation in the presence of feared stimuli that evoke escape or avoidance which may be out of proportion relative to the actual risk of danger and highly disruptive to important or daily events. The feared stimuli are often found within a community or home setting and may include avoidance of stimuli such as mannequins (e.g., Waranch et al., 1981), escalators (e.g., Runyan et al., 1985), dogs (e.g., Muskett et al., 2020), music (e.g., Buckley & Newchock, 2006), and loud noises (Fodstad et al., 2021).

Medical and Dental Procedures

Medical and dental procedures refer to situations involving routines that are carried out by medical or dental personnel (e.g., nurses, dentists, doctors, assistants, technicians). These routines include blood draws (e.g., Shabani & Fisher, 2006), annual physicals (e.g., Cavalari et al., 2013), and eye exams (Kupzyk et al., 2021). Many children experience anxiety during medical and dental procedures. As with feared stimuli from the previous category, medical and dental procedures acquire aversive features for some individuals due to the pairings of the routines with unpleasant experiences, such as the brief pain felt from a needle prick. A previously neutral syringe becomes conditioned as an aversive stimulus. Other stimuli in the environment may also be conditioned through a process known as higher-order conditioning (Miltenberger, 2016). Subsequently, aversive stimuli are encompassed by anyone wearing a doctor’s lab coat or a nurse’s uniform, the examination table, the doctor’s office, medical instruments, and any number of other stimuli (Allen & Kupzyk, 2016). The resulting operant behaviors such as avoidance, refusal, and aggression are strengthened each time the child escapes or avoids the aversive situation (e.g., the doctor gives up trying to give a needle suggesting they do it next time).

Children with autism have higher rates of noncompliance than their neurotypical peers (Allen & Kupzyk, 2016; Bryce & Jahromi, 2013; Ekas et al., 2017; Jennett & Hagopian, 2008) and may not be getting the preventative or diagnostic care that they need. The inability to passively cooperate during dental and medical procedures is a critical variable that may contribute to poor health outcomes. For example, some children require frequent unpleasant medical interventions, such as insulin injections for type 1 diabetes. For a child with autism and diabetes, administering daily injections may be challenging or impossible because the child may exhibit a variety of intense challenging behaviors (e.g., running away, screaming, biting), reducing the likelihood of consistent life-saving treatment. Some medical routines are much less invasive than injections, such as reading body temperatures, taking blood pressure, or using an otoscope or stethoscope, but these procedures nonetheless may evoke the same noncompliance in the form of intense challenging behaviors.

Hygiene Routines

Hygiene routines is another category of stimulus conditions that may evoke escape or avoidance behaviors for children with autism. These routines or tasks involve daily living skills that are important to a child's hygiene or personal care such as tolerating teeth brushing, hair cutting (Buckley et al., 2020) or nail clipping (Dowdy et al., 2018), but are reported to be problematic for caregivers of children with autism (Schumacher & Rapp, 2011). Many children with autism refuse to allow their caregivers to provide routine care by engaging in challenging behaviors such as screaming, running away or refusing to sit still. The mere sight of the toothbrush, scissors, nail clipper or related equipment (e.g., hair cutting cape) may lead to high anxiety and intense challenging behaviors. Even though these routines may have aversive features for both the caregiver and the child, they are usually important to a child's social development, health, and well-being.

Prolonged Tactile Contact

Prolonged tactile contact is the fourth category of stimulus situations that require passive cooperation. Prolonged tactile contact refers to a situation whereby a stimulus touches some part of the body for an extended period of time. In other words, a child may be required to wear something that is difficult to tolerate. Wearing simple and common devices may be required to improve a child's daily quality of life by providing access to activities, social interactions, and basic medical assessments. These important activities can be accessed by being able to tolerate devices such as eyeglasses (DeLeon et al., 2008), hearing aids (Nipe et al., 2018; Richling et al., 2011), or a heartrate monitor (Dufour & Lanovaz, 2020). Hence, practitioners should teach passive cooperation to children who engage in challenging behaviors when required to wear medical or health related devices.

More recently, a unique challenge was presented for all caregivers of young children, and especially those of children with autism. Mask wearing became an essential mitigation strategy for the COVID-19 pandemic in 2020 (Chu et al., 2020). Children with autism may present more risk for developing severe illness due to their compromised immune systems (Lima et al., 2020). After mandated school shutdowns in the spring of 2020, some parts of the United States began easing restrictions and reopening schools, with mask mandates for students. For caregivers with children with autism, mask wearing posed a major challenge since many children do not tolerate some tactile stimuli (e.g., Cook et al., 2015; Nipe et al., 2018; Sivaraman et al., 2021).

Antecedent Interventions

Exposure

Practitioners may manipulate antecedents in several ways such as exposure without and with fading. Exposure without fading consists of presenting the whole stimulus during a single training session. For example, Dowdy et al. (2018) used differential reinforcement without escape extinction to reinforce nail cutting with a child with autism. The researchers presented the nail clipper and reinforced a complete nail cut and any escape responses. Moreover, the session ended when the participant tolerated all nail cutting or when 5 min had elapsed. Implementing the procedure without incorporating fading was appropriate for this particular target skill because the task did not involve many steps, and it is not possible to repeatedly clip nails without extensive periods between sessions for nails to regrow. By contrast, exposure with fading gradually manipulates the duration, distance, amount, or context of presentation of the aversive stimulus. For example, Sivaraman et al. (2021) taught six children with autism to tolerate wearing a facemask for brief periods of time. The researchers provided continuous access to moderately preferred items while increasing the duration that the children kept the mask on for some sessions. At the end of the study, all children wore the face mask for the targeted duration of 10 min without challenging behaviors. Other studies gradually and systematically increased the time spent experiencing the aversive stimuli (Bishop et al., 2013; Cook et al., 2015; Cox et al., 2017; Dufour & Lanovaz, 2020; Richling et al., 2011).

Ricciardi et al. (2006) evaluated a procedure which faded the distance to increase passive cooperation for a child who avoided animatronic objects in public places. The researchers systematically decreased the proximity between the child and the object while providing continuous access to preferred items. The results showed that the participant remained at the specified distances without engaging in challenging behavior. Rapp et al. (2005) faded the amount of aversive stimulus (pool depth) using a procedure for pool avoidance. The researchers set up a situation in which an adolescent with autism received reinforcement for approaching the pool. Although active responses were initially reinforced, the researchers measured the omission of challenging behavior at each depth once the participant entered the pool. The criterion was gradually changed so that the participant needed to tolerate deeper parts. Carter et al. (2019) faded the context of an aversive situation when increasing cooperation with dental routines for two males with autism. The aversive features of the context involved a dental chair, a bib, an electric toothbrush, and a dental utensil. This procedure involved both aspects of passive cooperation (e.g., allowing teeth to be counted) and active cooperation (e.g., opening mouth).

Noncontingent Reinforcement

Several researchers have used NCR as a strategy to promote passive cooperation (e.g., DeLeon et al., 2008; Maguire et al., 1996; Nipe et al., 2018). For example, Richling et al. (2011) taught two children to tolerate prescription prostheses by providing NCR and access to escape. The researchers provided noncontingent continuous access to preferred items and music and delivered attention on a fixed time of 5 s. Additionally, the child had access to escape for 15 s contingent on removing the prostheses. Thereafter, the researchers placed the prosthesis back on the participant. NCR with the absence of escape extinction was effective for both participants to increase their passive cooperation with wearing prostheses. Given the side effects that may be induced by escape extinction, practitioners should consider options which allow for the exclusion of escape extinction while incorporating antecedent- or reinforcement-based strategies to increase passive cooperation with aversive stimuli.

Consequent Interventions

Differential Reinforcement of Other Behavior

When implementing differential reinforcement of other behavior (DRO), the caregiver or teacher provides a reinforcer in the absence of behavior after a pre-determined interval of time has elapsed (Miltenberger, 2016). In the case of passive cooperation, reinforcement is provided for the omission of challenging behavior that may interfere with cooperation during specific conditions (i.e., sitting still when getting blood drawn). Several studies support the efficacy of DRO for increasing passive cooperation (Dowdy et al., 2018; Dufour & Lanovaz, 2020; Reimers et al., 1988; Ricciardi et al., 2006). For example, Dufour and Lanovaz (2020) evaluated DRO for increasing compliance with wearing a heartrate monitor for two children with autism. The researchers delivered praise and edibles contingent on not touching the heartrate monitor on their chest for the specific interval. With every successful interval, the researchers increased the time criterion. Both participants met the criterion of 90 s with the device in contact with their chest despite participants having access to escape contingent on attempting to remove the device.

A variation of DRO used in the passive cooperation literature is differential negative reinforcement of other behavior (DNRO; Buckley & Newchok, 2006; Cook et al., 2015). Similar to DRO, this procedure involves reinforcing the omission of behavior, but in this case, the reinforcer is escape from an aversive situation. For example, Cook et al. (2015) demonstrated the effectiveness of DNRO as a procedure to increase cooperation with a child with autism for wearing a medical bracelet. The researchers systematically increased the interval when the child cooperated by keeping the bracelet on his wrist. At the end of each successful interval, the experimenter permitted the child to remove the medical bracelet for a pre-determined duration. Thus, cooperative behaviors resulted in escape (i.e., removal of the bracelet). Their results showed that DNRO was effective for increasing cooperation with wearing a medical bracelet for up to 7 hours at the clinic, and the authors reported that he wore the bracelet for 24-hr days for several years thereafter.

Differential Reinforcement of Alternative Behavior

As indicated earlier, DRA involves reinforcing a desirable behavior while minimizing reinforcement for an undesirable behavior (Vollmer et al., 2020). Several studies have used DRA as a procedure to increase passive cooperation (Birkan et al., 2011; Carter et al., 2019; Cavalari et al., 2013; Conyers et al., 2004; Ellis et al., 2006). Passive cooperation is, by definition, the omission of challenging behavior under specific stimulus conditions, but those stimulus conditions may involve a more complex context requiring specific active responses to facilitate the passive response. For example, passive cooperation at a dental visit requires that a child allows a dental hygienist to use a scaler, an aspirator, or other tools in their mouth. However, toleration of the dental cleaning procedure also requires the child to enter the room, sit in the chair, and open their mouth. Although the desired outcome is passive cooperation of a dental cleaning, the entire context relevant to this response involves some active responses. Said differently, passive cooperation may involve other behaviors beside sitting still, such as the typical responses involved in the routine tasks that passive cooperation is required.

In another example, a person who fears riding on escalators may be unable to engage in the typical responses of stepping on an escalator to get to the second floor of a mall where their favourite store is located. Their routine functioning at the mall is impaired relative to the ease of movement for other shoppers. Furthermore, the sight of the escalator may cause anxiety and intense behavior to avoid an area of the mall, and attempting to go to the mall at all may become debilitating. If the child (or their caregiver) deem learning to ride the escalator to be an important goal for intervention, the active responses of stepping on and off the moving escalator will be required to tolerate passively standing on the escalator as it carries the person to the next level (e.g., Runyan et al., 1985). Similarly, Cromartie et al. (2014) evaluated an intervention for the avoidance of blood draws using DRA. In this case, active responses such as walking to the office and extending an arm, along with the passive responses of waiting in the waiting room, accepting cotton to be swabbed across the arm, and allowing a tourniquet to be applied were criterion steps to ultimately facilitate passive cooperation when blood was being drawn. The child received reinforcement contingent on these approach steps (active or passive) within the DRA arrangement to successfully teach tolerating blood draws required for monitoring the safety and effectiveness of her medical intervention.

Response Blocking and Response Cost

To decrease challenging behaviors that interfere with cooperative responses, some researchers have utilized response blocking and response cost. DeLeon et al. (2008) evaluated a treatment package that included NCR, response blocking, and response cost that to teach four individuals to wear their eyeglasses. The response blocking procedure involved physically blocking attempts to remove the eyeglasses and for the first 5 s of the session to initially facilitate keeping the glasses on. Thereafter, the participant was permitted to remove their eyeglasses. Another component of the intervention included a response cost procedure involving the withdrawal of preferred items contingent on the participant removing the eyeglasses. The treatment package was successful for three participants, and when the researchers conducted a component analysis for two of those participants, they found that response blocking was an effective component for promoting passive cooperation with wearing eyeglasses. By contrast, NCR alone was sufficient for teaching the participant to keep their eyeglasses on for the fourth participant. Other studies have also incorporated response blocking (sometimes referred to as manual guidance) with their intervention and reported similar findings (Birkan et al., 2011; Cook et al., 2015; Rapp et al., 2005). In another study on the treatment of challenging behaviors associated with wearing eyeglasses and hearing aids, Nipe et al. (2013) conducted a component analysis and found that NCR was effective for increasing passive cooperation with wearing prostheses, but the effects were enhanced when response blocking and response cost procedures were added.

Escape Extinction

Challenging behaviors that occur within contexts associated with passive cooperation have a presumed negative reinforcement function insofar as the child engages in behaviors that result in avoiding or escaping the aversive situations. A common treatment for escape-maintained challenging behavior is escape extinction. Some researchers have implemented escape extinction as part of their intervention for decreasing challenging behaviors that interfere with passive cooperation (Birkan et al., 2011; Rapp et al., 2005). In this case, we are defining extinction as not allowing reinforcement for the behavior (disruptive behaviors do not result in escape), but other behavioral mechanisms may influence behavior. In an example of escape extinction used to decrease challenging behaviors during swimming pool avoidance in an adolescent with autism, Rapp et al. (2005) targeted escape behaviors by prompting the participant to sit in a chair that the researchers moved closer to the pool. This component of the intervention prevented the participant from escaping the aversive stimulus, which resulted in the reduction of challenging behavior and the toleration of a swimming pool.

Escape extinction has been shown to produce decreases in challenging behaviors. The main issue with escape extinction is that it may result in undesirable side effects such as aggression and emotional responding, making this strategy not a viable option for many caregivers and teachers (see Lerman & Iwata, 1995). Other researchers have evaluated treatments to increase passive cooperation with aversive tasks and decrease disruptive behaviors in the absence of escape extinction (Bishop et al., 2013; Dowdy et al., 2013; Dufour & Lanovaz, 2020; Richling et al., 2011; Schumacher & Rapp, 2011; Shabani & Fisher, 2006). Instead, the researchers provided escape contingent on challenging behavior. The findings from these studies showed that, even though challenging behavior continued to produce escape, the antecedent procedures or the reinforcement contingencies for cooperative behaviors resulted in desirable outcomes. Nonetheless, extinction is indicated when practical to achieve best outcomes (e.g., Vollmer et al., 2020). To mitigate the potential side effects of using escape extinction, practitioners may combine it with noncontingent or contingent reinforcement to increase passive cooperation.

Summary and Practice Recommendations for Passive Cooperation

The previous section described an area in the noncompliance literature that, to our knowledge, has not yet been reviewed: passive cooperation to tolerate aversive but important stimuli (or events) in a child’s life. These stimuli can be a challenge for typically-developing children, and may be exponentially more difficult for children diagnosed with autism. Despite the anxiety-inducing nature of these stimuli and the intense behaviors they may evoke, toleration is required for an individual’s medical well-being, general health, safety, and carrying out daily routines. Several least-restrictive intervention options may support behavior analysts in reducing challenging behavior related to passive cooperation such as exposure, NCR, DRO, and DRA. Due to the aversive aspects involved in problems requiring interventions to teach passive cooperation, practitioners should limit their use of more restrictive strategies (e.g., escape extinction, response cost and blocking) to situations when less restrictive alternatives have failed.

Additionally, a behavior analyst should be involved in designing these interventions due to ethical and safety concerns. Oftentimes, the intervention will also require the seamless collaboration of multiple professionals (e.g., doctors, dentists).

Conclusion

In sum, practitioners have multiple options when intervening to increase active and passive cooperation in children with autism. The first step involves conducting a functional assessment to identify the variables that maintain noncompliance and engagement in related challenging behavior. In the most likely event that the intervention includes a reinforcer or preferred stimulus, conducting a preference assessment also appears essential to increase the effectiveness. For clarity, we presented each intervention individually as part of the current chapter. In practice, we strongly recommend combining multiple interventions together to increase the probability of producing the targeted behavior changes. As evidenced by the exemplars discussed, most researchers combine several components when studying interventions for both active and passive compliance. As with any behavioral intervention, the main keys to success involve thorough assessment, careful treatment selection, and rigorous monitoring of the target behavior. Following this process will ensure that children with autism receive the best treatment to increase cooperation and, in turn, improve their health and well-being.

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