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Reducing the inappropriate behavior of a child with autistic disorder

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**REDUCING THE INAPPROPRIATE BEHAVIOR
OF A CHILD WITH AUTISTIC DISORDER**

A Thesis Proposal

Presented to

The Faculty of the Department of Psychology

San Jose State University

In Partial Fulfillment

Of the Requirements for the Degree

Master of Arts

by

Elizabeth R. Cutforth

May, 2000

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ABSTRACT

REDUCING THE INAPPROPRIATE BEHAVIOR

OF A CHILD WITH AUTISTIC DISORDER

By Elizabeth R. Cutforth

Autistic Disorder has been shown to be best treated with Applied Behavioral Analysis (ABA; Lovaas, 1987; Schreibman, Koegel, Mills, & Burke, 1981). The inappropriate behaviors of a boy diagnosed with Autistic Disorder was the focus of this experiment, and ABA was implemented utilizing a single case, multiple baseline reversal design. He was observed without intervention, with an Indirect Punishment, with a Direct Punishment, and with a Redirection technique. The purpose of the experiment was to determine the most effective behavioral method to decrease problematic behavior. It was hypothesized that the frequency of the disruptive behavior would decrease more dramatically in the Direct Punishment condition, but Redirection to alternative stimuli would provide an equally-effective technique without the use of punishment. Results indicated that, in comparison to Baseline, behaviors increased during Indirect Punishment and decreased during the Direct Punishment and Redirection conditions.

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Running head: BEHAVIORAL INTERVENTION

Reducing the Inappropriate Behavior of a Child with Autistic Disorder

Elizabeth R. Cutforth

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Abstract

In general, Autistic Disorder has been shown to be best treated with Applied Behavioral Analysis (ABA; Lovaas, 1987; Schreibman, Koegel, Mills, & Burke, 1981). The inappropriate behavior of a boy diagnosed with Autistic Disorder was the focus of this experiment, and ABA was implemented utilizing a single case, multiple baseline design with reversal. He was observed without intervention, with an Indirect Punishment, with a Direct Punishment, and with a Redirection technique. The purpose of the experiment was to determine the most effective behavioral method to decrease problematic behavior. It was hypothesized that the frequency of the disruptive behavior would decrease more dramatically in the Direct Punishment condition, but Redirection to alternative stimuli would provide an equally-effective technique without the use of punishment. Results indicated that, in comparison to Baseline, behaviors increased during Indirect Punishment and decreased during the Direct Punishment and Redirection conditions.

Reducing the Inappropriate Behavior of a Child with Autistic Disorder

Autistic Spectrum Disorders (ASD), include diagnoses such as Autistic Disorder, Asperger's Syndrome, Rett's Disorder, and Atypical Autism. ASDs are thought to have a biological etiology, although the exact mechanism is not known (e.g., Fotheringham, 1991). Researchers have suggested that a number of different biological causes may lead to the behavioral characteristics commonly observed in individuals with ASD. These characteristics, including atypical affect, self-stimulatory behavior, social isolation, compulsions, and sometimes aggression, hyperactivity, mutism, sensory dysfunction, and mental retardation (depending on the severity of the disorder), can be detrimental to nearly every aspect of the individual's life. Individuals with ASD often have a wide range of deficits that can manifest in the reduced ability to acquire appropriate language, academic, play (in childhood), socialization, self-help, and sensory-regulation skills. Several treatments have been proposed to address any combination of these deficits and accompanying behavior problems (i.e., Schopler, 1987; Gupta, Aggarwal, & Heads, 1996; Martineau, Barthelemy, Jouve, Muh, & Lelord, 1992). Although results vary, extensive amounts of treatment success have been reported for nearly all of the ASD diagnoses utilizing Applied Behavioral Analysis (ABA) as a treatment intervention for young children (i.e., Lovaas, 1987). This can be very successful for many children, but this treatment has not provided reliable results across the entire spectrum of the disorder. Researchers have not determined the most appropriate treatment for all children with ASD, likely due to unsuccessful attempts to pinpoint the etiology of the disorder.

History

When the diagnosis was first recognized in the 1940s, it was believed that children with ASD developed their symptoms due to the emotional distance of their mother (Kanner, 1943). It is currently purported that ASD develops in children regardless of the amount of emotional attention they receive (Rutter, 1985). Unfortunately, for the most part, this appears to be the only widely accepted research finding; the remainder of the literature is inconclusive. Researchers have indicated a number of neurological dysfunctions, ranging from immune system dysfunction (Gupta et al., 1996) to Fragile X Syndrome (Lombroso, Pauls, & Leckman, 1994) to an excess of serotonin (Piven et al., 1991) and abnormal dopamine levels (Martineau et al., 1992). Dozens of medications have also been proposed to alleviate symptoms of autism, but these drugs have provided relief for neither all children with ASD nor all autistic symptoms (none actually “cure” autism). For this reason, medically-based treatments have had variable success.

A major obstacle to determining etiology is the lack of useful first-hand information professionals receive from this population. The diagnosis of ASD is based upon behavioral observations rather than self-report of the symptoms the children are experiencing. As a consequence, many of the interventions and treatments designed for this population must be based upon inference of their experiences and implementation of treatment programs based on an analysis of the individual and a trial and error approach. Of the many medical and psychological attempts to help this population, ABA has demonstrated the most success.

At present, ABA has been documented by several sources as the most successful treatment for ASD (Lovaas, 1987; Schreibman, Koegel, Mills, & Burke, 1981). The intensive treatment focuses on changing the behavioral symptoms of the disorder, decreasing inappropriate behaviors, such as aggression and inappropriate self-stimulation, while increasing appropriate behaviors, including prosocial behavior and academic achievement (Lovaas, 1987). The treatment utilizes behavioral principles such as reinforcement and punishment to control behavior problems, and Discrete Trial (DT) training (teaching very specific skills at a time) to teach individuals how to function appropriately in school, at home, and in public. The purpose of DT is to help young children with ASD catch up to their peers in terms of academic and social ability. In Lovaas' (1987) original study, almost half of the participants who received 40 hours per week of DT training had achieved normal intelligence ratings and typical first grade classroom integration by 6 years of age. The children were also rated by blind observers as indistinguishable from their typically developing peers. Many other participants benefited from the treatment, but did not catch up to their peers in terms of grade or intelligence level, while others achieved very little gain from the treatment. The differential improvements made could be attributed to the variability in the population of children diagnosed with ASD. Lovaas attributed the variability in his research to etiology, hypothesizing that different underlying etiologies might have lead to varied treatment results. A follow-up study indicated the maintenance of typical social and intellectual developmental progress for all but one of the original successful population (McEachin, Smith, & Lovaas, 1993).

Not all researchers agree that ABA is the best possible treatment for this population. Some have argued that Lovaas' results were not replicable, and that his treatment groups were biased (Foxx, 1993). Mundy (1993) addressed the issue of whether the treatment resulted in complete alleviation of the autistic symptoms, or rather a higher-functioning autism. He was concerned that the participants were experiencing the internal symptoms of autism as opposed to the external symptoms of autism.

Alternative treatments have been proposed over the years, although without the impressive documented results of ABA. In a long list of purported "cures," the Option method was proposed to cure ASD through full acceptance of autistic symptoms (Jordan & Powell, 1993). However, this program has been greatly criticized, and has yet to indicate statistical support for the claims it makes. Facilitated Communication has also been proposed to cure the underlying social deficit of ASD (Dillon, Fenlason, & Vogel, 1994). In this treatment, ASD individuals purportedly typed their thoughts and feelings on a computer while adults physically supported them. Unfortunately, researchers discovered that the adult facilitators often took control and typed what they thought the children were thinking.

Among the more promising of these alternative treatments proposed for this population was Treatment and Education of Autistic and related Communication handicapped CHildren (TEACCH). Supporters of this treatment have reported great success in North Carolina (Schopler, 1987). TEACCH is a statewide program offering comprehensive treatment interventions involving collaboration with parents, professionals, and the state. As a measure of their program success, it was reported that

only 8% (as compared to 38% or more in other studies) of their autistic population were institutionalized. However, no other statistical comparisons were made in this study (such as intelligence or social skill level), and thus a comprehensive picture of the type of children evolving from this program was not clarified.

Additional methods of treatment have been proposed to address the sensory dysfunction observed so often in individuals with ASD. Beginning with Kanner's first recognition of autism in 1943, researchers have noted an auditory sensitivity to sounds in some individuals with ASD. Since then, sensory input regulation difficulties of all kinds have been observed, including hypo- and hyper-sensitivities to any combination of the senses (Lincoln, Courchesne, Harms, & Allen, 1995). Deep pressure therapies (Zissermann, 1991), auditory training (Bettison, 1996), musical interaction therapy (Wimpory, Chadwick, & Nash, 1995), and several others have been proposed to address sensory dysfunction. These therapies are often used in conjunction with other treatments. In fact, many young ASD children might receive ABA at home, attend schools utilizing the TEACCH methodologies, receive medication, and attend Occupational and Speech Therapy. In other words, in practice most of these treatments are not mutually exclusive, and might be considered as treatment options in conjunction with ABA. Unfortunately, there is no controlled research at present that systematically compares these interventions, in conjunction with one another, or as a function of intensity.

Behavioral Principles

ABA principles have been utilized inside and outside treatment sessions to reduce problematic behaviors, such as self-stimulation that interferes with learning or social

situations, and increase appropriate behaviors that optimize learning or facilitated prosocial behavior. Several tools have been used to accomplish this. In the ABA literature, punishment is defined as a stimulus event that decreases the likelihood that a behavior will occur again in the future, whereas reinforcement is an event that increases the likelihood that a behavior will occur later. Although easily defined, in practice these are sometimes difficult to generalize among the ASD population because individuals with this diagnosis have such a wide range of self-stimulatory behaviors, sensory dysregulation, interests, and aversions. Thus, it follows that no one reinforcer, punishment, or redirection technique will be effective for the entire population with ASD. For example, a hug may function as a reinforcer for one child (i.e., who has tactile hyposensitivity) but may be aversive to another child (i.e., who has tactile hypersensitivity). Moreover, the context defines how a stimulus functions as a reinforcer. In one context (i.e., in mid-afternoon) a cookie may be a reinforcer, but may not in another (i.e., following a large, sugary dessert). It becomes the role of the ABA therapists to determine these factors for each individual child with ASD on a continual basis and apply what they deduce to be the most appropriate way to control inappropriate behaviors.

To accomplish this, it is necessary that the antecedents preceding an individual's behavior be understood. Behavioral antecedents have been a considerable focus of clinical attention for this population (Koegel, Schreibman, Britten, & Laitinen, 1979). This is because a single behavior can have any number of purposes depending on the situation. For example, a child may scream because he did not get a cookie, someone

touched his arm, the lights are too bright, or he stubbed his toe. With an understanding of stimulus control, clinicians can approach problem behaviors with an understanding under what conditions a behavior occurs. This analysis of stimulus control together with an appreciation of the effective reinforcers and punishers allow for a full understanding of the purpose that the behavior holds. This process is known as conducting a functional analysis. Functional analysis is then crucial to the understanding of behavior, and has been used repeatedly to experimentally manipulate behaviors and the learning experiences of children with ASD (Haynes & O'Brien, 1990).

Functional analysis is used to determine the antecedents (preceding events) and consequences (resulting reinforcement or punishment) associated with behavior. The consequences determine the likelihood that behavior will increase (when reinforced) or decline (when punished) given the occurrence of the same antecedent event at a later time. Horner, Day, and Day (1997) explained that a functional analysis identifies a problem behavior, the antecedent to this behavior, and preceding establishing operations. Establishing operations are defined as contextual factors that alter the reinforcing or punishing effectiveness of a stimulus. As an example, rocking on a rocking chair can be very soothing to a child who is tired, but may not be when that same child has just been playing a chasing game. Horner and colleagues found that by introducing neutralizing routines just after the establishing operation occurred, problem behaviors substantially decreased. This behavior modification method provides an appealing way to control problem behaviors because it does not involve negative consequences. Instead, it decreases the likelihood of the occurrence of inappropriate behaviors in a positive way.

Other methods have had much more controversy surrounding the short-term or long-term consequences of their techniques. For instance, three problems associated with extinction procedures have been addressed in the literature. Extinction is the removal of the reinforcer associated with the targeted behavior. For example, if a child screams for a cookie then gets it, his screaming behavior is reinforced. To extinguish this behavior, the child is not given a cookie if he screams. Eventually, screaming should decrease in the future. The first problem associated with this technique is an extinction burst (Lerman, Iwata, & Wallace, 1999), in which there is an increased frequency, duration, or intensity of a behavior directly following the removal of the reinforcement. In other words, a screaming child would likely scream more, longer, or louder before he or she would decrease this behavior. This is of particular concern when the child displays behaviors that have been reinforced by negative social attention such as aggressiveness or self-injury. The second difficulty associated with extinction is the high incidence of extinction-induced aggression. For example, although the target of interest might be screaming, a child might become aggressive toward an adult when his or her screaming is ignored. Both of these problems may be very difficult for parents to remain consistent in the application of an extinction protocol. Parents might find it extremely difficult to listen to excessive screaming or tolerate being hit for long without giving in and reinforcing the behavior. The third problem associated with extinction is that it does not address alternative ways to meet the need of the original behavior (Fisher, Lindauer, Alterson, & Thompson, 1998). If a child's screaming behavior is systematically ignored, the child is not taught any other way in which to request a cookie. He or she would likely choose

some other inappropriate way to achieve this goal. Therefore, extinction is not a sufficient tool to solve a problem. The child must be taught how to request a cookie in an alternative, socially appropriate way in order to observe a decline in negative behaviors.

Methods of reinforcement are not just used to control behavior. In ABA, these methods have been introduced to increase learning. Koegel and Egel (1979) found that a circular relationship exists among reinforcement, persistence, and successful task completion. That is, the more reinforcing a task, the more persistent a child will be, and the more successful the task performance. In turn, this leads to a higher degree of motivation, further reinforcement value, and the cycle continues. Koegel and Williams (1980) utilized a direct reinforcement technique to increase motivation for children in DT programs. They hypothesized that the reinforcement style used in typical DT was not direct enough for some children to understand that they were being rewarded. The researchers found that skill acquisition was quicker when they used a direct response-reinforcer relationship. For these tasks, it was important to match the stimuli with what the individual considered reinforcing. For example, a child might learn to do a shape-sorter puzzle quicker if the pieces made an auditory, reinforcing sound when placed correctly. However, the shape-sorter may actually be aversive to another child with auditory hypersensitivity.

The self-stimulatory behaviors so commonly seen in the ASD population are often a target of behavioral attention, inside and outside of learning situations. Although self-stimulatory behaviors are common in all humans (i.e., rocking in a rocking chair), the quality and quantity are distinct in ASD. Specifically, the behaviors occur much more

often than in the typical population, they are often socially inappropriate (i.e., repeating a movie script out loud, staring at fingers in front of light, touching other people's skin, etc.), and they interfere with learning situations (Koegel & Covert, 1972). Koegel and Covert conducted a functional analysis of self-stimulatory behaviors to a discrimination learning task and found that learning occurred only when the children were not engaged in self-stimulation. Therefore, self-stimulatory behaviors can be targeted and manipulated so that they achieve the same internal goal, yet are more socially appropriate and interfere less with daily functioning.

In this study, three distinct behavioral manipulations were attempted to reduce inappropriate self-stimulatory behaviors in a child with ASD. A functional analysis of a single problem behavior was conducted. The Participant (W) was observed under four experimental conditions: Baseline (no intervention), Indirect Punishment (saying, "no"), Direct Punishment (specifically associated with the source of stimulation), and Redirection (to a more appropriate way to achieve the goal of the original self-stimulatory behavior). Specific punishment and alternative reinforcers were chosen for W according to the antecedents determined to be preceding the behavior and reinforcers that were determined to be desired by the child.

Three hypotheses were considered. First, it was predicted that the frequency of the specified problematic behavior would remain constant in the Indirect Punishment condition because the punishment was not associated with the self-stimulatory behavior, nor would it provide an alternative to the behavior. Second, it was hypothesized that the frequency of the problematic behavior would decrease dramatically during the

Redirection condition. This was based on past research stating that a functional analysis of certain behaviors can determine underlying sensory needs, and provide more appropriate ways to meet them (i.e., McGill, 1999). Third, it was hypothesized that frequency of these behaviors would nearly cease during the Direct Punishment condition. In this condition, removing a reinforcing stimulus related to the inappropriate behaviors was hypothesized to have a more powerful punishing effect and would decrease the target behaviors. This prediction was related to past research stating that relating reinforcing stimuli directly to a task increases the likelihood the task will be learned (Koegel & Egel, 1979). The hope was that the same principles would also apply to the use of punishment. Specifically, that both reinforcement and punishment related directly to the behavior of interest would more effectively shape this behavior.

Method

Participants

W, a 4 ½-year-old boy diagnosed with Autistic Disorder participated in the experiment. He had been receiving approximately 20 hours per week of ABA training, 2 hours of occupational therapy, 2 hours of speech therapy, and 16 hours in a special education preschool class. W was reported to have made considerable academic and behavioral progress since the beginning of treatment (18 months prior to the study) attributed to early treatment intervention. However, his parents reported several residual behavior problems, particularly outside treatment. His parents and teachers were concerned about the slower rate of improvement outside the treatment sessions than

within the sessions. Thus, a behavior specifically maintained outside of treatment was targeted in this study, in this case a vocal “growling” behavior.

W had a large vocabulary of delayed echolalic speech. As a consequence, his language contained only sentences learned directly from a model. He was observed to exhibit imitative language derived from adult models, adult instruction, and videos; but he did not create independently constructed sentences. For example, W was observed to express wants by saying things like, “I want cracker, please.” Although he occasionally expressed his wants in more limited ways, such as “cracker,” he did not express this in any different sentence form, such as “can I have a cracker?” or “I’m hungry for crackers.” The psychologist’s reports indicated his speech, play, oral-motor, fine motor, and social skills were functioning at approximately a 3-year-old developmental level. However, his parents reported that he maintained some disruptive and inappropriate behaviors. For example, he occasionally hit others, threw inappropriate objects (such as toys and learning materials), and growled when overstimulated. All of these behaviors were present at treatment onset. Over the course of treatment, his parents and teachers reported a dramatic decrease in these behaviors, yet the change was less remarkable in non-treatment settings. The latter behavior (growling) was chosen for this study because of its predictable nature. Although his growling had decreased somewhat in social settings (growling at or near others), the behavior was continuously seen when W saw animals (in person or on video).

A functional analysis of W’s behavior indicated that it occurred when he lacked the appropriate verbal scripts to express excitement. His parents reported that W was

infatuated with animals. He sought out animal toys (such as lions, snakes, and dinosaurs), animal videos (such as “Jumanji”), and situations involving animals (such as local parks with birds and squirrels, and the outside of a neighbor’s house with a fenced-in dog). When animals approached him (such as a dog or kitten), he was observed to express fear and attempt to flee. However, when he was in contact with small animals that avoided contact with him (such as birds, squirrels, and the family’s house cats), he aggressively chased the animals while growling at them with his hands by his face in fists. It was determined from this information that this behavior resulted from a lack of verbal skills to express excitement. For example, when he saw a bird, he did not express excitement by saying, “It is a bird!” Instead, he chased the bird, growling and seeming to lose control of his behavior (i.e., sometimes even running into the street). This growling behavior generalized to animal videos as well. For ethical reasons (not wishing to subject animals to systematic chasing), it was decided to study his behavior while watching videos featuring animals. When he saw animals on video, he often growled very realistically while making stereotypic gestures with his body. Specifically, he would bend his knees, spread his legs, and bend his arms out so that his hands were near his face in fists (seeming to simulate a dinosaur).

Materials

The experimenter and W’s older brother (eight years old) were present in all conditions. His brother was included for two reasons. First, it acknowledged that the experiment took place in the participant’s home, and approximated regular evening activities more accurately. Second, his brother was known to induce growling behaviors.

Because it was not possible to ensure he would never be present, his constant presence ensured a control of the baseline number of growls W exhibited. Several other people and other materials were present in the room randomly throughout the experiment. His mother, father, and grandmother were occasionally in the room. These people did not affect W's behavior in a different way than did his brother alone, which was another reason why his brother was chosen to be present in the experiment. One exception to this occurred when his brother's friend (who was known to increase W's aggressive behavior) came to the house. The treatment session was canceled when the experimenter learned about this tendency. Additionally, small toys he brought in from his bedroom (such as dinosaurs, lions, and a play castle), and armchairs on which he commonly climbed were present in the room. The experimenter chose the videos "Jumanji," "Tarzan," "Land Before Time," and "Lion King" (because of the utilization of animals in each video) from his collection. Before each session, he was given a choice of these videos to watch. W chose each video several times.

Design and Procedure

A multiple baseline design with reversal was conducted (following an ABACADACADABA design). The target behavior was observed in a combination of four condition levels: Baseline (A; no response to the behavior), Indirect Punishment (B; saying "no growling"), Redirection (C; replacing the behavior with a more appropriate one: verbalization), and Direct Punishment (D; coupling the behavior with a punishment directly related to it: turning off the television). After the initial presentation of the conditions, the sequence was repeated in a randomly-chosen order.

All sessions lasted 20 minutes. Sessions were recorded in the evening, between the hours of 5:30 and 8:30 p.m. Sessions were often held back-to-back for the purposes of time constraints and out of courtesy for the family, whose evening routine was disrupted.

The number of growling behaviors was tallied by hand by the experimenter. Initially, the frequency of growling behaviors was also recorded on video to allow for more accurate data recording. However, following the first three sessions, it was discovered that the video recorder did not accurately depict the behavior. W occasionally walked out of the visual range of the video, and often growled in a quiet speaking voice not picked up by the microphone. Access to more sensitive technology was not available, thus video recordings were not utilized in data collection. Despite the presence of the video camera in the first few sessions, the experimenter also recorded behavior by hand as described above. Thus, consistency of data collection procedures was not compromised when video recording ceased. The tapes utilized in the initial sessions were erased immediately following the data collection.

W was observed in his own living room watching television. In the Indirect Punishment condition, he was told, "no growling," in a low, disapproving pitch after the behavior onset. If he continued to growl, he was told, "W...no growling," in a lower pitch. The loudness and intensity of the experimenters voice was never above that of a normal speaking tone. In the Redirection condition, W was immediately and playfully asked questions, or was requested to repeat a descriptive verbalization of the events occurring in the movie (i.e., "the elephants are running!"). A functional analysis of the behavior indicated that the growling likely occurred as an expression of excitement. If

this were true, verbalizations of the cause of excitement would achieve the same goal as the growling behavior. For the Direct condition, the television was turned off immediately when W growled. The television was kept off for a 30-second time period after the onset of each occurrence of the target behavior.

Eye contact was frequently made with W, and the experimenter smiled often. Additionally, the experimenter responded to all of his attempts at communication, regardless of the condition. For example, he occasionally commented on the video, such as to say, “he’s sleeping,” and “it’s very big, isn’t it?” These attempts were responded to warmly with simple comments such as “yes, he is,” and “hum...I think it’s small,” respectively. However, verbal initiations were only made by the experimenter during the Redirection condition.

The Baseline condition alternated between 2 and 3 sessions to account for time as a confound for results in the following treatment condition (see Figure 1). That is, every other baseline condition was alternatively shorter. Every treatment condition was observed for 3 sessions.

Results

Results are depicted graphically, displaying changes in the frequency of behavior occurring in each session (see Figure 1). This graphic representation of the data is consistent with the literature in this area. Researchers targeting behavior change in ASD treatment often analyze data with a single-case descriptive strategy (e.g., Koegel & Egel, 1979; Horner, Day, & Day, 1997; Lerman, Iwata, Shore, & De Leon, 1997). Statistical

Figure 1

Frequency of Target Behavior per Observation Session

procedures requiring larger samples or normally distributed variance in the data are not relevant because of the intensive focus required in single-case studies.

As seen in Figure 1, the Baseline sessions varied dramatically. Figure 1 shows that most of the drastically low or high frequencies occurred directly following a treatment condition, then decreased or increased to a number more closely approximating the average number of growling behavior for that session. The first sessions in Baseline 2, Baseline 3, Baseline 4, Baseline 5, and Baseline 8 show a carry over effect for frequencies of the target behavior from the previous condition. However, these carryover effects only appeared for the first session, then generally returned to a less extreme number of behaviors. An exception to this regression to the mean occurred in Baseline 3. In the third session of this condition, W's growling behavior increased to three times that of the average number of behaviors in this condition. During this session, W was behaving aggressively towards his brother, growling incessantly for a period of a few minutes while occasionally pretending to hit him. When this behavior escalated to actual hitting, his mother interceded and scolded W for hitting his brother by giving him a time-out in his bedroom. The time spent in the time-out was not included in the 20-minute observation session.

The average number of growls W exhibited in each of the baseline conditions ranged between 3 and 6.67 (see Table 1). Notice, however, the variability of the behavior within the individual conditions. These ranged from 1 to 16 growls per session. This is noteworthy when compared to the variability within the treatment groups.

Table 1.

Average Number of Target Behavior in Each Baseline Condition

Condition	Average
1	5.67
2	6.00
3	6.67
4	3.00
5	5.50
6	4.33
7	6.00

As seen in Table 2, the target behavior increased during the Indirect Punishment condition ($\underline{M} = 15.5$) compared to Baseline ($\underline{M} = 5.53$). Additionally, the range of scores within the individual sessions remained consistently high, with a range of 10 – 25 growls per session. While in this treatment condition, W was observed to display attention-seeking behaviors that he did not exhibit in any other condition. For example, he often growled while smiling and looking directly at the researcher expectantly. This behavior was particularly common directly following the administration of the Indirect Punishment. Specifically, W was observed to growl at the television with a serious expression on his face. When the researcher told him, “no growling,” he often immediately growled again, but this time at the researcher rather than at the television, and with a smile on his face.

The average number of growls per condition decreased in the Direct Punishment condition ($\underline{M} = 3.5$). This behavior remained fairly consistent across sessions in this condition, with a range of 1 – 5 growls per session. W appeared notably distressed when the television was turned off, and each time requested that it be turned back on. Each time the punishment was implemented, it was explained to him that the television was turned off because of his growling. To test his understanding of the connection between the behavior and consequence, the experimenter asked him while the television was off, “what is the rule?” W generally responded by saying, “no growling.” Figure 1 shows that in both replications of the Direct Punishment condition, the behavior continuously decreased in frequency as the sessions continued.

Table 2.

Average Number of Target Behavior per Condition

Condition	Average
Baseline	5.53
Indirect Punishment	15.50
Direct Punishment	3.50
Redirection	3.17

During the Redirection condition, the target behavior occurred at a low rate ($M = 3.17$) when compared to the Baseline. Similar to the Direct Punishment condition, the range of growls in the Redirection condition did not vary greatly, with a range of 2 – 4 growls in a session. In this condition, W's growling behaviors were interrupted by more relevant and socially appropriate means of communicating excitement. For instance, W was presented with probing questions (i.e., "what's happening?") and comments (i.e., "look! It's a monkey!") to encourage his utilization of independently-produced comments and conversation. If these attempts failed to produce language, he was given a direct verbal prompt in which he was requested to repeat a statement (i.e., "say, 'the monkey is eating'"). W was very compliant during these requests for a verbal response and rarely required direct verbal prompting to produce language statements.

The intricacies of the ABACADACADABA multiple baseline with reversal design described above allowed for a comparison of each of the conditions to each other (see Table 3) and to Baseline (see Figure 2).

Discussion

This experiment demonstrated that the utilization of Direct Punishment and Redirection procedures successfully decreased W's growling behavior when compared to Baseline. In addition, the results indicated that the behavior increased substantially when an Indirect Punishment (saying, "no growling") was used. Finally, these results were replicated with the utilization of a multiple baseline design with reversal. As seen in Table 3, the frequency of behavior in each initial condition was replicated the subsequent session.

Figure 2.

Average frequency of target behavior per session

Table 3.

Average Frequency of Target Behavior per Treatment Session

	Initial Session	Reversal Session
Indirect Punishment	15.33	15.67
Direct Punishment	3.67	3.33
Redirection	3.33	3.00

The Baseline frequency of behaviors at first glance appeared sporadic. A careful analysis of Figure 1 indicates that the majority of the variance in each Baseline condition might be accounted for by carryover effects from the treatment conditions prior to the Baselines. This was deduced because the majority of eccentricities in the data occurred during the first session after a treatment condition, then generally returned to normal. The major exception to this phenomenon occurred during the third Baseline, during which target behavior rose dramatically during the third session due to a fight between W and his brother. Because the experiment took place in the home, the nature of his surroundings could not be fully controlled.

The Indirect condition provided some data that support the hypothesis (that Indirect Punishment would not successfully decrease target behavior) more than was predicted. While it was predicted that no difference between the Indirect and Baseline conditions would be present, the growling increased dramatically during the Indirect condition. Coinciding with this, behavioral changes were noted to be specific to this condition. W appeared to take on a mischievous type of behavior. He growled at the experimenter (rather than the television) with an expecting grin, and continued to growl especially after the punishment (saying, “no”) had been administered. This was clearly not the most appropriate intervention to utilize for W, given this information. Not only did he growl much more often in the Indirect Punishment condition than in Baseline, but he also seemed to enjoy the punishment. These data may provide initial evidence that simply saying “no” is not an effective intervention for children with ASD.

W growled to a lesser degree in the Direct Punishment condition than in the Baseline. This supported the hypothesis that behavior would decrease when punishment was directly related to the source of the target behavior. A closer look at the number of growls per session shows a decline in the target behavior across sessions (see Figure 1). In both replications, the number of growls in the third session was less than the other two sessions. It is possible that learning occurred across these sessions and the target behavior might have decreased further if this condition were given more time to develop. However, this statement cannot be fully supported by these results and might be a subject of interest for future research.

The finding that Direct Punishment provided a much more effective way in which to decrease problematic behavior was not surprising. This finding supported the work of other researchers (i.e., Koegel & Egel, 1979; Koegel & Williams, 1980). Although others have utilized reinforcement directly related to a target behavior, the essential hypothesis (that treatment will be more successful in altering a behavior if the intervention is directly related to the behavior problem) is the same.

In the Redirection condition, W's growling also decreased as compared to Baseline. This supported the hypothesis that the frequency of behavior would decrease with the utilization of Redirection. During this condition, W was engaged in a conversation-like interaction with the experimenter which did not occur as often in other conditions. He was observed answering the experimenter's questions, requesting that the experimenter play with him, and also initiating conversation with both the experimenter and others in the household more commonly than in other conditions (i.e., "It's a

dinosaur, Grandma,” and “The picture’s beautiful, isn’t it?”). This information is displayed in Figure 3. This was not included in the results section as it was not related to the original hypothesis. W’s number of appropriate, self-initiated verbalizations were tallied in addition to the target behavior to determine if Redirection would encourage W to initiate appropriate verbalizations. Verbalizations were not included in the data collection if they were a response to a question, a repetition of something the experimenter said, or a repetition of something said in the video. As seen in Table 4, the average number of appropriate verbalizations were higher in the Redirection condition than in all other conditions (which were roughly equal). In addition to this, it was observed that W did not initiate a desire to play with the therapist in any other condition, yet requested play three times in the Redirection condition.

In this condition, no time was spent in a negative interaction with the experimenter; all conversation between W and the experimenter were comments or questions specific to either the video or the toys he may have been interacting with at the time. When the target behavior occurred in the Redirection condition, no overt attempts to change his behavior were made (W was never told “no”). Instead, he was distracted from the behavior and offered a chance to express what the experimenter believed he wanted to say. It was rare that the experimenter prompted W to repeat entire sentences. Instead, the experimenter asked questions or commented on the situation believed to be at the root of the behavior (i.e., “What do you see?”). This is encouraging, because W was most likely expressing what he truly wished to express with only encouragement (rather than full prompts) from the experimenter. It is possible that the successful decrease in

Figure 3.

Average Number of Appropriate Verbalizations per Condition

Table 4.

Average Number of Appropriate Verbalizations

Condition	Average
Baseline	5.24
Indirect Punishment	5.00
Direct Punishment	5.67
Redirection	8.17

growling in this condition was a result of attention paid to W. In other conditions, verbal initiations were not made by the experimenter. Two attempts were made to control for this attention factor. During all conditions, eye contact was frequently made, in which the experimenter smiled warmly at W. His attempts to communicate were always responded to, regardless of condition. Thus, he was certainly not ignored during these other conditions.

The average number of growls in the Direct Punishment and Redirection conditions were approximately equal. This finding is particularly important because many parents are uncomfortable with the use of punishment to control inappropriate behaviors, and this may suggest an effective strategy to alter problem behaviors without the utilization of punishment. Additionally, some schools do not allow the utilization of punishment of any kind (including the use of “no”). The success of this condition is promising not only for parents, but for teachers, therapists, and other professionals working with this population. Clearly, more research is necessary in this area. Future research might implement this type of behavioral methodology and analysis of intervention in the classroom with a larger number of participants.

The results of this experiment supported much of the literature on the behavioral treatment of ASD. Given the assumption that behavior serves some function for the individual, the utilization of punishment has been criticized for not addressing alternative ways to meet the goal of the problem behavior (Fisher et al., 1998). The successful application of the Redirection technique is consistent with the literature emphasizing the importance of determining behavioral antecedents (i.e., Koegel et al., 1979; McGill,

1999). By determining the antecedent of W's behavior, an alternative behavior easily replaced the inappropriate one in this condition.

This experiment has some limitations that future research would need to address. The largest limitation of this experiment with respect to generalizability was the utilization of only one participant. Although the limited participant number allowed for a more detailed description of the methodology and results, the information obtained is not necessarily generalizable to other children. However, the reversal design in the experiment successfully replicated the results for W, and it is hoped that these results serve as a starting point for further research in this area.

In addition to this problem, a set of problems with this experiment occurred as a result of the naturalistic setting in which the experiment took place. Although steps were made to control the environment as much as possible (i.e., ensuring his brother was present during every session, pre-selecting the videos, conducting the experiment at the same time of day, etc.), certain factors could not be controlled (i.e., toys available in the room, other people, etc.). As a consequence, the targeted behavior was not always directed specifically at the television. Occasionally it was directed to people or toys in the room. This was not differentiated in the collection of the data. The only condition for which this might have created a problem was the Direct Punishment condition, in which the removal of television (turning it off for 30 seconds) was utilized as the punishment. Regardless of where the behavior was directed, though, the removal of the television was always noticed. Each time the television was turned off, W consistently stopped what he was doing, and requested that it be turned back on.

Finally, it is recommended that future research account for any data collection errors that may have occurred with this experiment by either the utilization of sensitive video equipment to capture the target behaviors accurately, or by the presence of an additional data collector. This would allow for a test of inter-rater reliability.

This experiment successfully demonstrated the effectiveness of Direct Punishment and Redirection on the reduction of growling behavior in a boy diagnosed with ASD. Further research should explore these behavioral methodologies with a larger sample and in other settings to test the generalizability of these results. Given the initial findings of this study, and the potential benefits of using the Redirection as an intervention, future research may benefit from focusing on this treatment strategy.

References

- Bettison, S. (1996). The long-term effects of auditory training on children with autism. Journal of Autism and Developmental Disorders, 26, 361-374.
- Dillon, K. M., Fenlason, J. E., & Vogel, D. J. (1994). Belief in and use of a questionable technique, facilitated communication, for children with autism. Psychological Reports, 75, 459-464.
- Fisher, W. W., Lindauer, S. E., Alterson, C. J., & Thompson, R. H. (1998). Assessment and treatment of destructive behavior maintained by stereotypic object manipulation. Journal of Applied Behavior Analysis, 31, 513-527.
- Fotheringham, J.B. (1991). Autism: Its primary psychological and neurological deficit. Canadian Journal of Psychiatry, 36, 686-692.
- Foxx, R. M. (1993). Sapid effects awaiting independent replication. American Journal on Mental Retardation, 97, 375-376.
- Gupta, S., Aggarwal, S., & Heads, C. (1996). Brief report: Dysregulated immune system in children with autism: Beneficial effects of intravenous immune globulin on autistic characteristics. Journal of Autism and Developmental Disorders, 26, 439-452.
- Haynes, S. N. & O'Brien, W. H. (1990). Functional analysis in behavior therapy. Clinical Psychology Review, 10, 649-668.
- Homer, R. H., Day, H. M., & Day, J. R. (1997). Using neutralizing routines to reduce problem behaviors. Journal of Applied Behavior Analysis, 30, 601-614.
- Jordan, R., & Powell, S. D. (1993). Reflections of the option method as a treatment for autism. Journal of Autism and Developmental Disorders, 23, 682-685.

- Kanner, L. (1943). Autistic disturbances of affective contact. Nervous Child, 2, 217-250.
- Koegel, R. L. & Covert, A. (1972). The relationship of self-stimulation to learning in autistic children. Journal of Applied Behavior Analysis, 5, 381-387.
- Koegel, R. L. & Egel, A. L. (1979). Motivating autistic children. Journal of Abnormal Psychology, 88, 418-426.
- Koegel, R. L., Schreibman, L., Britten, K., & Laitinen, R. (1979). The effects of schedules of reinforcement on stimulus overselectivity in autistic children. Journal of Autism and Developmental Disorders, 9, 383-397.
- Koegel, R. L. & Williams, J. A. (1980). Direct versus indirect response-reinforcer relationships in teaching autistic children. Journal of Abnormal Child Psychology, 8, 537-547.
- Lerman, D. C., Iwata, B. A., Shore, B. A., & De Leon, I. G. (1997). Effects of intermittent punishment on self-injurious behavior: An evaluation of schedule thinning. Journal of Applied Behavior Analysis, 30, 187-201.
- Lerman, D. C., Iwata, B. A., & Wallace, M. D. (1999). Side effects of extinction: Prevalence of bursting and aggression during the treatment of self-injurious behavior. Journal of Applied Behavior Analysis, 32, 1-8.
- Lincoln, A. J., Courchesne, E., Harms, L., & Allen, M. (1995). Sensory modulation of auditory stimuli in children with autism and receptive developmental language disorder: Event-related brain potential evidence. Journal of Autism and Developmental Disorders, 25, 521-539.

Lombroso, P. J., Pauls, D. L., & Leckman, J. F. (1994). Genetic mechanisms in childhood psychiatric disorders. Journal of the American Academy of Child and Adolescent Psychiatry, 33, 921-938.

Lovaas, I. O. (1987). Behavioral treatment and normal educational and intellectual functioning in young autistic children. Journal of Consulting and Clinical Psychology, 55, 3-9.

Martineau, J., Barthelemy, C., Jouve, J., Muh, J., & Lelord, G. (1992). Monoamines (serotonin and catecholamines) and their derivatives in infantile autism: Age-related changes and drug effects. Developmental Medicine and Child Neurology, 34, 593-603.

McEachin, J. J., Smith, T., & Lovaas, O. I. (1993). Long-term outcome for children with autism who received early intensive behavioral treatment. American Journal on Mental Retardation, 97, 359-372.

McGill, P. (1999). Establishing operations: Implications for the assessment, treatment, and prevention of problem behavior. Journal of Applied Behavior Analysis, 32, 393-418.

Mundy, P. (1993). Normal versus high-functioning status in children with autism. American Journal on Mental Retardation, 97, 381-384.

Piven, J., Tsai, G., Nehme, E., Coyle, J. T., Chase, G. A., & Foslstein, S. E. (1991). Platelet serotonin, a possible marker for familial autism. Journal of Autism and Developmental Disorders, 21, 51-59.

Rutter, M. (1985). The treatment of autistic children. Journal of Child Psychology and Psychiatry, 26, 193-214.

Schopler, E. (1987). Specific and Nonspecific Factors in the Effectiveness of a Treatment System. American Psychologist, 42, 376-383.

Schreibman, L., Koegel, R. L., Mills, J. L., & Burke, J. C. (1981). Social validation of behavior therapy with autistic children. Behavior Therapy, 12, 610-624.

Wimpory, D., Chadwick, P., & Nash, S. (1995). Brief report: Musical interaction therapy for children with autism: An evaluative case study with two-year follow-up. Journal of Autism and Developmental Disorders, 25, 541-551.

Zissermann, L. (1991). The effects of deep pressure on self-stimulating behaviors. American Journal of Occupational Therapy, 46, 547-551.

APPENDIX

Human Subjects-Institutional Review Board Approval Form

San José State
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TO: Elizabeth Ford-Cutforth
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FROM: Nabil Ibrahim, Ph.D.
AVP, Graduate Studies & Research

DATE: April 10, 2000

The Human Subjects-Institutional Review Board has approved
your request to use human subjects in the study entitled:

"The Reduction of Socially Inappropriate
Behaviors in Two Children with Autism
Utilizing Differential Behavioral Approaches"

This approval is contingent upon the subjects participating in your research project being appropriately protected from risk. This includes the protection of the anonymity of the subjects' identity when they participate in your research project, and with regard to any and all data that may be collected from the subjects. The Board's approval includes continued monitoring of your research by the Board to assure that the subjects are being adequately and properly protected from such risks. If at any time a subject becomes injured or complains of injury, you must notify Nabil Ibrahim, Ph.D., immediately. Injury includes but is not limited to bodily harm, psychological trauma and release of potentially damaging personal information.

Please also be advised that all subjects need to be fully informed and aware that their participation in your research project is voluntary, and that he or she may withdraw from the project at any time. Further, a subject's participation, refusal to participate, or withdrawal will not affect any services the subject is receiving or will receive at the institution in which the research is being conducted.

If you have any questions, please contact me at
(408) 924-2480.

The following San José State
University staff members are
available to assist you with
your research project. Please
contact them for assistance.
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