

Home-Based In Vivo Desensitization Treatment of Bathroom Avoidance in a Child With Autism Spectrum Disorder

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Abstract

We report the case of a 7-year-old boy who had autism spectrum disorder and displayed disruptive and avoidant behavior when using the bathroom at home with people present in adjoining rooms or nearby the bathroom door. Desensitization treatment was implemented by gradually exposing the boy to proximity of an in-home therapist when he was in the bathroom and positively reinforcing the absence of disruptive behavior. Treatment effectively eliminated bathroom avoidance and generalized to settings outside the home. Intervention outcome was maintained 6- and 7-months post-treatment.

Keywords

autism spectrum disorder, fears, graduated exposure, phobia, phobic avoidance

I Theoretical and Research Basis for Treatment

Some children and youth who have autism spectrum disorder (ASD) experience distress and display avoidant behavior in the presence of particular objects and situations (Leyfer et al., 2006). Such presentation is commonly diagnosed as social phobia, specific phobia, or phobic avoidance (American Psychiatric Association, 2013; Jennett & Hagopian, 2008). Social phobia is characterized by marked and persistent fear of social situations in the presence of unfamiliar people and with anticipation of being embarrassed or humiliated. Persons with specific phobia have unreasonable fear of coming in contact with particular objects. Reported prevalence rates of social phobia and specific phobia among children and youth with ASD are between 7.5%-20.5% and 30%-64%, respectively (Leyfer et al., 2006; Muris, Steememan, Merckelback, Holdrinet, & Meesters, 1998; Turner & Romanczyk, 2012; Van Steensel, Bogels, & Perrin, 2011). In both social phobia and specific phobia, “Behavioral responses may include wincing, crying, shaking, and the emergence of avoidance behaviors such as physically attempting to escape from the situations or stimulus” (Lydon, Healy, O’Callaghan, Mulhern, & Holloway, 2015, p. 144). Concerning

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phobic avoidance, the defining characteristic is avoidant behavior that is “coupled with responses universally considered as indicators of anxious and fearful states (e.g., crying, screaming, physical resistance, running away, shaking, wide eyes, grimacing, and aggressive or other problem behavior)” (Jennett & Hagopian, 2008, p. 151).

In a systematic review of the treatment literature for children with ASD, Lydon et al. (2015) found that fears and phobias in this population are often unusual and idiosyncratic, for example, certain types of sensory stimulation, swimming pools, particular locations, and riding a school bus. Furthermore, 75% of the studies that Lydon et al. reviewed encountered challenging behavior in the presence of the feared stimulus-condition. Evans, Canavera, Lee-Kleinpeter, Maccubbin, and Taga (2005) also emphasized the high correlation between fears–phobias and challenging behavior among children with ASD. The typical function of challenging behavior is avoidance of and escape from the feared stimulus-condition.

For some children with ASD, fear-provoked avoidant behavior has been reduced through exposure (Williams, Field, Riegel, & Paul, 2011) and cognitive-behavior therapy (Nadeau, Arnold, Selles, Storch, & Lewin, 2015). As well, *in vivo* desensitization treatment by gradually shaping and positively reinforcing a person to approach and tolerate the presence of a feared stimulus-condition can be effective (Luiselli, 2011). In one case, Ricciardi, Luiselli, and Camare (2006) intervened with an 8-year-old boy who was diagnosed with autism and specific phobia of electronic animated figures. Treatment consisted of identifying a distance from the figures he could comfortably tolerate, providing him continuous access to preferred materials, and progressively reducing the distance until he was able to touch and remain in close proximity to the figures. Grider, Luiselli, and Turcotte-Shamski (2012) adopted a similar approach with a 21-year-old man who had autism and specific phobia of having his blood drawn (phlebophobia). A graduated approach hierarchy started with him completing preparatory responses (sitting in a nurse’s office, extending his arm), then progressively tolerating exposure to a hypodermic needle, simulated skin prick, and actual blood draw. His success along the hierarchy was reinforced with contingent praise and noncontingent viewing of preferred videos. Other ASD medical desensitization research has reported similar results in teaching individuals to accept needle injections (Shabani & Fisher, 2006) and physical examinations (Cavalari, DuBard, Luiselli, & Birtwell, 2013; Cuvo, Reagan, Ackerlund, Huckfeldt, & Kelly, 2010).

As an illustration of intervention for phobic avoidance, Schmidt, Luiselli, Rue, and Whalley (2013) treated a 16-year-old boy with autism who avoided and actively resisted entering the music room, gymnasium, and exercise area at his school. Before intervention, prompting him to enter these locations resulted in aggression, self-injury, property destruction, and elopement. A successful treatment plan was developed by having the boy walk to designated markers that were initially distant from the entrance at each location. Tangible and social reinforcement were presented when he did not demonstrate problem behavior. Through graduated exposure, the markers were moved closer to the entrances, with ongoing reinforcement for success, until the boy was able to access and remain within each setting.

A review of the published literature by Jennett and Hagopian (2008) concluded that there is sufficient empirical support for behavioral treatment of phobic avoidance in individuals with intellectual disabilities. Furthermore, the most effective behavioral treatment adopts an *in vivo* desensitization approach by combining graduated exposure and positive reinforcement. Whereas most behavioral treatment of fears, phobias, and phobic avoidance among children and youth with ASD has taken place in specialized settings such as schools, clinics, and hospitals (Lydon et al., 2015), the present case describes home-based *in vivo* desensitization implemented with a boy who had ASD and avoidant behavior associated with using the bathroom. Notably, only one other case report of bathroom avoidance (fear of flushing toilet) in a child with autism has been published in the extant literature (Jackson & King, 1982).

2 Case Introduction

George (a pseudonym) was a 7-year-old boy diagnosed with autism. He lived at home with his parents in a two-story house, attended a special education school program each weekday, and also received home-based applied behavior analysis (ABA) services. George communicated verbally but his expressive language was limited and not always purposeful. He was able to perform most self-care and daily living skills with adult assistance. George also sought out and enjoyed leisure activities such as gross-motor play and interacting with video games. The focus on school and home-based programs was to increase his communication and independent living skills. George had not received formal cognitive testing but was estimated to function at a moderate level of intellectual disability (American Psychiatric Association, 2013).

3 Presenting Complaints

The focus of treatment was George's disruptive behavior when he had to use the second-floor bathroom in his home when other people were upstairs in adjoining rooms or nearby the bathroom door. If people were present or if he heard a person walking upstairs, George became disruptive by yelling and crying loudly while in the bathroom. He would also position his head outside the bathroom door, highly agitated and distressed. His disruptive behavior intensified and became more problematic until the people present left the second floor or his parents instructed them to do so. Under these private conditions, George would then toilet himself appropriately. Bathroom avoidance also occurred at school and community settings; however, in these locations, George never eliminated in the toilet because he would refuse to enter the bathrooms.

4 History

George had received special education services at an early age, including ABA intervention at a public school and subsequently enrollment in a private school with complimentary home-based therapy. At the time of referral, he attended the private school 6 hr on weekdays (total school hours per week = 30). Home-based ABA services were provided to George and his family an additional 5 hr after school (total home hours per week = 25).

By his mother's report, the problem of bathroom avoidance started when the family lived in a previous home approximately 1 to 1.5 years earlier. She stated that George would yell out and become disruptive in the bathroom when visitors were in the home or walked by the bathroom door. The disruptive and avoidant behavior continued when the family moved to their new and present home 3 months preceding treatment. Talking to George about the problem and encouraging him "not to worry" if other people were present when he needed to use the bathroom had been ineffective. Formal intervention to treat bathroom avoidance had not been implemented previously at school or home.

5 Assessment

Direct Measurement

The therapist providing in-home ABA services recorded whether George was able to use the second-floor bathroom without *crying*, defined as the presence of tears, and *yelling*, defined as vocalizing louder than conversational level from a distance of 5 feet. These data were recorded during a toileting trial that started when George independently requested to use the bathroom and concluded when he returned to the first floor. Toileting trials were conducted each weekday when the in-home therapist was scheduled to conduct ABA services with George.

The dependent measure was the steps in a desensitization hierarchy (defined below) that George completed successfully during toileting trials. A successful toileting trial was recorded when he did not demonstrate crying and yelling. On occasion, there were days when George did not request to use the bathroom; therefore, data were plotted as the desensitization hierarchy steps completed successfully on consecutive (noncontinuous) toileting trials.

Social Validity Assessment

Following the study, George's mother completed a seven-item social validity questionnaire that sampled her opinions about the home-based desensitization treatment and results. The questionnaire items were the following: (a) My son's disruptive behavior in the bathroom was a serious problem at home and other locations, (b) I supported the need for a home-based program to eliminate my son's disruptive behavior in the bathroom, (c) I had no difficulty identifying my son's disruptive behavior in the bathroom, (d) The home-based program to eliminate my son's disruptive behavior in the bathroom was clearly explained to me, (e) The home-based program to eliminate my son's disruptive behavior in the bathroom was implemented positively, (f) As the result of the home-based program, my son is no longer disruptive in the bathroom when other people are close by, and (g) As the result of the home-based program, my son is no longer disruptive in bathrooms outside of the home. For each item, she endorsed one rating according to a 5-point Likert-type scale (1 = *strongly disagree*, 2 = *disagree*, 3 = *neither agree nor disagree*, 4 = *agree*, 5 = *strongly agree*).

6 Case Conceptualization

Preceding treatment, the first author conducted functional behavioral assessment (FBA) through direct observation, interview with George's mother, and review of baseline data. The FBA confirmed that George consistently cried and yelled in the bathroom if other people were present on the second floor. We hypothesized that crying and yelling were escape motivated and negatively reinforced by terminating the unpleasant condition of people's presence when they exited or did not approach the second floor. The objective of treatment was to have George refrain from crying and yelling by teaching him to gradually tolerate proximity of another person when he used the bathroom at home.

7 Course of Treatment and Assessment of Progress

The in-home therapist implemented baseline and treatment procedures in the context of a changing criterion design (Kazdin, 2011). The criteria were the individual stairway steps comprising a 15-phase desensitization hierarchy.

Baseline Assessment

When George stated that he needed to use the bathroom, the in-home therapist responded, "Okay, I will go upstairs with you." After walking to the second floor, the in-home therapist sat in the foyer outside the bathroom door waiting for George. If George cried or yelled as defined by the measurement protocol, the in-home therapist announced, "Okay, George, I am going downstairs now," immediately exited the second-floor foyer, and waited on the first floor for George to finish in the bathroom and walk downstairs.

Treatment

We constructed a desensitization hierarchy corresponding to the 18 stairway steps that started on the first floor and ended on the second floor of George's home. When George stated that he

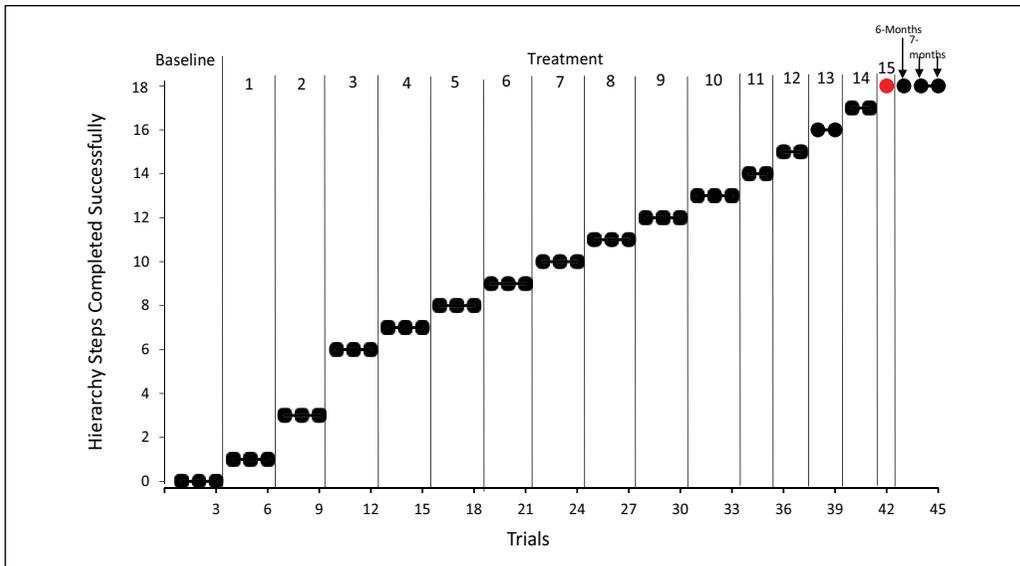


Figure 1. Desensitization hierarchy steps George completed successfully (absence of crying and yelling) during baseline, treatment, and follow-up phases.

needed to use the bathroom, the in-home therapist informed him, “Okay, I am going to sit right here,” and pointed to the stairway step that was currently targeted in the desensitization hierarchy. The in-home therapist also told George, “If you talk nicely, you will get a token.” Talking nicely were the words used with George to indicate the absence of crying and yelling when he was in the bathroom. Through prior ABA services, George had responded positively to token reinforcement. In the present study, the tokens he earned could be exchanged for several minutes playing preferred video games on an iPod Touch or Nintendo 3DS.

Phase 1 of treatment began with the in-home therapist sitting on the first stairway step. At Phase 2, he moved to the third step, and then to the sixth step at Phase 3. Thereafter, steps were advanced one at a time from Phase 4 through Phase 15. During Phases 1 to 10, the in-home therapist moved ahead when George demonstrated three consecutive successful trials. From Phases 11 to 14, steps were advanced following two consecutive successful trials. The study concluded with a single trial at Phase 15, the top stairway step on the second floor.

Figure 1 shows the desensitization hierarchy steps George completed successfully (absence of crying and yelling) during baseline and treatment phases. In baseline, he was unable to tolerate presence of the in-home therapist outside the second-floor bathroom for three consecutive trials. During treatment, his success was determined by the absence of crying and yelling with the in-home therapist positioned at the stairway step programmed in each treatment phase. The changing criterion design depicted in Figure 1 reveals that George was successful 100% of the time at each stairway step. Specifically, he was able to use the bathroom without crying and yelling at every criterion advancement throughout the course of treatment.

George’s mother endorsed the highest approval rating (5) for every item in the social validity questionnaire. These results verified she “strongly agreed” that her son’s disruptive behavior in the bathroom was a serious problem at home and other locations, a home-based program was needed to eliminate the problem, she had no difficulty identifying the disruptive behavior, and the desensitization treatment was clearly explained. Relative to treatment application, she “strongly agreed” that George’s home-based program was implemented positively and eliminated his disruptive behavior in the bathroom both inside and outside the home.

8 Complicating Factors

There were no complicating factors implementing home-based desensitization treatment with George. The in-home therapist was able to conduct intervention with full consent and approval from parents. As well, treatment was consistent with the goals and objectives of ABA home services. George was highly responsive to treatment, as revealed by his steady and uninterrupted movement through the desensitization hierarchy and outcome maintained at follow-up.

9 Access and Barriers to Care

The family's health insurance covered home-based ABA services and in vivo desensitization treatment. There were no barriers accessing plan coverage or with service delivery.

10 Follow-Up

The in-home ABA services with George ended immediately after treatment when he started attending a new school. These services were subsequently reinstated and the in-home therapist was able to resume measurement 6- and 7-months post-treatment with baseline conditions in effect. Figure 1 shows that George continued to use the bathroom at home without disruptive or avoidant behavior. His mother confirmed that he was also able to use bathrooms appropriately at school and other community settings.

11 Treatment Implications of the Case

Our findings support the effectiveness of graduated exposure and positive reinforcement for treating fears, phobias, and phobic avoidance in individuals who have ASD and other neurodevelopmental disorders (Cavalari et al., 2013; Grider et al., 2012; Ricciardi et al., 2006; Shabani & Fisher, 2006). The basis for this approach is allowing a person to slowly contact an unpleasant stimulus-condition without provoking distress and disruption. Reinforcement is made contingent on successful approach responses and gradually tolerating the aversive situation. As in the present case, the combined application of graduated exposure and positive reinforcement cannot isolate the therapeutic benefit of either procedure implemented alone.

We instituted several guidelines to expedite completion of the desensitization hierarchy. Treatment began by moving from stairway step 1 in Phase 1 to stairway step 3 in Phase 2, and from stairway step 3 to stairway step 6 in Phase 3. As George progressed with subsequent one-step increases, we adjusted the advancement guideline from three consecutive successful trials (Phases 1-10) to two consecutive successful trials (Phases 11-14). An alternative approach, not used in the study, would be to intermittently conduct terminal-step probes before the entire desensitization hierarchy was completed. Successful performance during probe assessments would indicate that treatment could be hastened by omitting steps that had not yet been programmed but were completed without distress and avoidant behavior.

One limitation of the present study was that we were unable to have a second observer in the home to formally assess interobserver agreement. However, preceding the baseline phase, the in-home therapist confirmed with George's mother the presenting problems of crying and yelling, respective response definitions, and measurement method. Social validity assessment found that George's mother had no difficulty identifying her son's disruptive behavior in the bathroom nor did the in-home therapist misidentify the occurrence or nonoccurrence of crying and yelling throughout the study.

The social validity of George's treatment was revealed further by the long-term maintenance, his mother's consistently high approval of the in-home program, and her confirmation that he no

longer had bathroom avoidance when people were present at home or he had to use a bathroom in outside settings. The apparent generalization of the desensitization treatment to people other than the in-home therapist and to multiple environments was a critical determinant of therapeutic success in this case.

12 Recommendations to Clinicians and Students

We recommend graduated exposure and positive reinforcement as the first-line behavioral treatment of fears, phobias, and phobic avoidance among children and youth with ASD (Jennett & Hagopian, 2008; Luiselli, 2011). This approach to intervention should begin with FBA that identifies attributes of the feared stimulus-condition that are associated with challenging behavior. With George, we hypothesized that lack of privacy contributed to his bathroom avoidance. For other children with ASD, noise and other sensory stimulation may be difficult to tolerate. In such cases, desensitization treatment would entail constructing a graduated exposure hierarchy according to stimulus intensity.

The steps making up a desensitization hierarchy should be sufficiently small to promote successful approach responding, particularly during the earliest intervention phases. As illustrated in this case, it may be possible to accelerate the pace of intervention when a person demonstrates sustained progress with desensitization. However, too rapid exposure to the steps in a desensitization hierarchy could pose an obstacle to treatment and necessitate a slower and more deliberate progression. For example, if George had demonstrated increased bathroom avoidance after advancing to a higher step in the desensitization hierarchy, our treatment objective would have been dropping to the preceding step, re-establishing success, and moving forward again.

The need for positive reinforcement with in vivo desensitization treatment demands identification of a person's stimulus and activity preferences. George reliably selected video games, but in some cases, more formal preference assessment may be required to confirm potentially effective reinforcers (Tiger & Kliebert, 2011). Absent positive reinforcement, it is unlikely that a child or youth with ASD will be compliant with desensitization treatment to overcome persistent fear, phobia, or source of phobic avoidance.

Declaration of Conflicting Interests

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