Brief Report

Integration of Wait Training and Graduated Exposures to Treat Medical Anxiety

Clinical Practice in Pediatric Psychology
2025, Vol. 0(0) 1–6

DOI: 10.1177/21694826251328048
journals.sagepub.com/home/ppx
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Abstract

Objective: The purpose of the current study was to evaluate an alternative treatment to distraction for a child with disruptive behavior and medical anxiety. **Method:** Behavioral skills training and parent management training were used to address disruptive behavior, as a measure of distress tolerance, of a typically developing, 4-year-old white male, LeRoy, who presented with dysfunctional elimination syndrome and vesicoureteral reflux. A changing criterion single case design was used to evaluate the effect of procedures on rates of disruptive behaviors and seconds of appropriate waiting during exposures. **Results:** Results suggest LeRoy mastered an ability to appropriately wait for 150 s. Rates of disruptive behavior decreased by 94.61% during delayed gratification as well as 83.33% and 54.17% for his two medical procedures, respectively. **Conclusion:** The current procedures were successful in treating the patient's disruptive behavior and medical anxiety. The procedures pose a potential alternative treatment to distraction techniques for children who require frequent medical procedures that evoke disruptive behavior.

Implications for Impact Statement

Children who experience medical anxiety and associated disruptive behavior may benefit less from distraction techniques when medical tests and procedures are so frequent that children habituate to distractions. The current study outlines procedures for increasing child tolerance for delayed gratification and medical procedures through parent-implemented treatment. Parental use of procedures likely served as an incompatible response to parental accommodation, allowing for therapeutic effects of exposures.

Keywords: anxiety, exposure, behavioral parent training, functional communication training

Received: 4 June 2024; revised: 18 February 2025; accepted: 3 March 2025

The merit of exposure and response prevention (ERP) as a treatment for anxiety-related disorders is well documented and spans decades of research (e.g., Foa & McLean, 2016; Marshall, 1985; Wolpe, 1961). ERP aims to sever the connection between a stimulus and an emotional response by habituating the individual to the feared stimulus and preventing contact with the reinforcing contingency maintaining maladaptive behavior (i.e., escape/avoidance). Within the field of behavior analysis, experiential avoidance is the presumed function behind anxious/fearful responses, as individuals seek the negative reinforcement of avoiding or escaping aversive environmental stimuli or private events (i.e., thoughts) related to the object of anxiety/fear (Friman & Dymond, 2020). For children with anxiety disorders, escape/avoidance is frequently provided through parental accommodation (e.g., removal of aversive stimuli, providing reassurance, etc.), which negatively impacts treatment outcomes (Lebowitz et al., 2012).

An extensive literature exists on the treatment of anxiety and disruptive behavior related to medical tests and procedures (St Joseph & Machalicek, 2021). However, most studies evaluate the impact of distractor stimuli on minimizing the aversive nature of exposures to medical tests and procedures (e.g., Slifer et al., 2011).

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Although the use of distraction techniques is well documented, there may be occasions where such procedures could be contraindicated, such as for individuals whose medical conditions require frequent procedures that might lead to habituating to distractor stimuli or pairing distractor stimuli with the procedure. As a result, individuals could experience an increase in the aversive nature of the procedure as distractors lose potency, resulting in an increased likelihood of challenging behavior. In these cases, it may be more effective to refrain from programming distractor items during ERP and rather habituate individuals to the aversive stimuli. For instance, Grayson et al. (1982) evaluated the impact of providing distractor activities on within- and between-session habituation. Participants experienced greater between-session habituation to feared stimuli when distractor items were not provided during ERP. Further, Vande Voort et al. (2010) found the use of non-exposure-based techniques to address anxiety, such as relaxation and cognitive restructuring, resulted in less improvement in functioning than exposure techniques.

Edelstein et al. (2021) implemented parent management training via telehealth for parents to serve as the primary interventionists treating their children's challenging behavior. Clinicians coached parents to conduct functional communication training (FCT) and wait training procedures with typically developing children with histories of disruptive behavior to increase their tolerance for delays and denied access to reinforcement. FCT consisted of teaching appropriate requests for patients to use to access preferred items or adult attention. Following mastery of appropriate requests, wait training procedures required patients to demonstrate calm behavior for increasing intervals starting with 5 s and progressing incrementally to 1–3 min before accessing preferred activities or attention. Similarly to Grayson et al. (1982) withholding distractor stimuli during ERP, distractor items were not provided to patients during wait intervals to maximize experiencing and habituating to boredom when preferred activities were unavailable.

The current study sought to evaluate the use of ERP without use of distraction as the primary mechanism for tolerance to treat a child's disruptive behavior evoked by medical procedures associated with his urology conditions. Further, the study served as a systematic replication and extension of Edelstein et al. (2021) in two ways. First, the utility of the procedure was evaluated via an in-person (rather than remote) service model. Second, ERP procedures were added as the terminal phase of treatment following patient mastery with delayed gratification (wait training). The goal of the current study was to improve skills such as patient distress tolerance and parental use of differential reinforcement that could serve to decrease parental accommodation and increase the effectiveness of ERP for medically necessary procedures.

Method

Patient and Setting

LeRoy was a typically developing, 4-year-old white male who presented with dysfunctional elimination syndrome, vesicoureteral reflux, and disruptive behavior during associated medical tests and daily procedures. During visits to his urologist for medical testing, the placement of lead stickers on his body frequently resulted in disruptive behaviors. Additionally, LeRoy was required to wear a urostomy pouch each night to collect urine while he slept following the surgical insertion of a suprapubic catheter. Each day, he was required to tolerate the removal of his pouch, the capping of his port, and a 2-min scheduled sit on the toilet every 2 hours.

He and his parents participated in a 20-hour behavioral parent training program in a specialty hospital outpatient clinic and consented to data being included in research approved by the Institutional Review Board. Services were provided in person via daily, two-hour appointments for two consecutive weeks. Sessions were conducted in a 10′x 10′ treatment room equipped with an observation room and camera system. A patient bathroom was located approximately 15 ft from the treatment room.

Materials

Visuals

Two laminated 3 × 5 in. cards were used to signal appropriate behavior expectations during treatment. One card consisted of three pictures representing the clinic rules (i.e., calm body, safe hands, and quiet voice). The other contained a preferred picture selected by the patient and his functional communication response (i.e., excuse me) written on the card.

Timers

Timers were used to display how much time remained during delays to reinforcement within wait training and ERP procedures.

Dependent Variables

Tantrums were operationally defined as non-contextual instances of crying, shouting, dropping to the floor, and throwing items. Each individual instance of disruptive behavior within a tantrum (e.g., every thrown item, every shout following taking a breath, etc.) was included within total counts per trial. The duration of appropriate waiting behavior was measured as an incompatible behavior to tantrums and used as the primary dependent variable upon which treatment decisions were made. The duration of exposures in seconds was also recorded. A secondary observer was available for 75% of treatment trials across

conditions. Trial-by-trial interobserver agreement was 100% for seconds of appropriate waiting and 98.81% for disruptive behavior.

Procedures

Functional Interview

A brief functional interview (Edelstein et al., 2023) was conducted during the first day of services to operationally define tantrums, gather information on antecedents and consequences of behavior, and review LeRoy's current medical procedure recommendations. Parental responses suggested LeRoy's tantrum behaviors were maintained by multiple operants, as he engaged in tantrum behaviors following restricted access to preferred items (e.g., Legos) and to escape or avoid medical procedures. LeRoy's tantrum behaviors also frequently resulted in adult attention when parents would try to help him calm down or comment on disruptive behavior.

Synthesized Contingency Analysis (SCA)

An SCA (Hanley et al., 2014) was conducted to evaluate the role of social positive (i.e., attention and tangible) functions in evoking and maintaining LeRoy's tantrums. Clinicians alternated between test and control conditions, each 5 min in duration, until three test and two control conditions were conducted. Prior to each test condition, LeRoy was provided with access to a preferred item (e.g., an iPad) for 2 min. Test conditions within SCAs consist of simultaneously presenting multiple triggers and then removing the triggers contingent on problem behavior. In LeRoy's case, parents simultaneously diverted their attention from LeRoy and restricted his access to the iPad. Contingent on problem behavior, LeRoy's parents returned the iPad and provided attention (e.g., "Fine, have the iPad back"). These steps were repeated after 30 s, and this cycle continued for the duration of the 5-min test condition. For each control condition, LeRoy was provided with preferred items and adult attention throughout the 5 min. Additionally, no demands were placed on LeRoy during control conditions. The clinician collected data from an observation room while his parents implemented assessment procedures.

Functional Communication Training (FCT)

Clinicians used behavioral skills training (i.e., instruction, modeling, rehearsal, and feedback; Crane, 1995) to teach FCT procedures to parents, who served as the primary interventionists. The procedures consisted of a compound functional communication response involving an appropriate vocalization (i.e., excuse me) followed by an additional request. Practice trials consisted of diverting adult attention and restricting access to preferred items, then immediately returning items and providing adult attention contingent on appropriate requests. After LeRoy demonstrated independence with appropriate requesting for three consecutive trials, wait training procedures were introduced.

Wait Training

During wait training trials, an additional step was added between LeRoy's appropriate request and access to reinforcement (i.e., adult attention and preferred items). After an appropriate request, LeRoy was required to demonstrate clinic rules (i.e., calm body, safe hands, and quiet voice) for a set duration of time in accordance with cumulative duration schedules of reinforcement (e.g., Mellott & Ardoin, 2023). Distractor items were not provided during wait intervals to promote habituation to delays (e.g., Edelstein et al., 2021). A changing criterion design (Hartmann & Hall, 1976) was implemented to demonstrate experimental control over appropriate requesting and waiting behavior such that following three consecutive successful trials, the required wait duration was increased. Wait durations were increased until LeRoy reached the goal of 150 s waits, which were consistent with the length of time required for completing his medical procedures at home.

Exposure and Response Prevention (ERP)

Once LeRoy demonstrated mastery with tolerating 150-s waits, ERP procedures were imbedded into wait intervals with graduated exposures. The first medical procedure (Procedure 1) addressed in this manner was his urostomy pouch. Graduated exposures for this process consisted of walking to the bathroom door with the clinician and a parent, walking into the bathroom with a parent and immediately leaving, remaining in the bathroom for 1 min with a parent, walking to the bathroom with a parent to have his bag removed and port capped, and all previous steps plus conducting a 2-min scheduled sit. The second procedure implemented (Procedure 2) within ERP required tolerating lead stickers being placed on LeRoy's body. Graduated exposures consisted of adults placing the testing stickers on their clothing, adults placing stickers on their bodies, LeRoy placing one sticker on his body for 10 s, increasing the sticker count until reaching the six total stickers, and increasing the duration he was required to wear all the stickers prior to accessing reinforcement. If exposure durations were shorter than 150 s, LeRoy was expected to continue following clinic rules without distractor items for the remainder of the wait interval. If exposure duration exceeded the wait interval, LeRoy was provided access to preferred items for the remainder of the exposure (e.g., receiving his iPad after 150 s).

Results

LeRoy's rates of disruptive behaviors during the SCA resulted in clear differentiation between test and control conditions (Figure 1), which confirmed the hypothesis that

his tantrums at least partially served a social positive function (i.e., accessing preferred items and adult attention). LeRoy mastered his functional communication response by trial 13, at which point his parents took over as interventionists for the remainder of treatment. The continued implementation of FCT beyond LeRoy's demonstrated mastery was due to allowing for generalization of LeRoy's appropriate behavior from the clinician to his parents and providing parents with additional practice implementing differential reinforcement procedures with fidelity while refraining from parental accommodation (e.g., providing access to preferred items to escape child tantrum behavior). During wait training, LeRoy engaged in low rates of disruptive behavior during 150 s waits prior to tolerating three consecutive trials. Overall, LeRoy's average rate of disruptive behavior from the SCA test conditions (M = 1.67) reduced by 94.61% compared to all 150 s wait interval trials (M = 0.09).

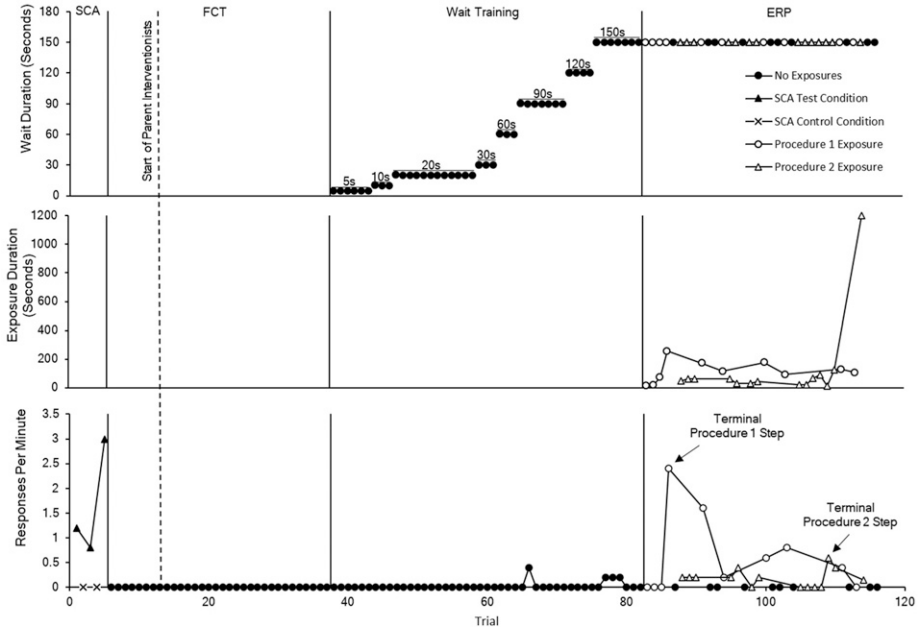
Disruptive behavior was not observed during initial ERP trials until trial 86, when the exposure included the terminal step for Procedure 1 (i.e., LeRoy's urostomy pouch removal). The observed increase in disruptive behavior was the largest rate since the SCA. However, decreasing trends in disruptive behavior were observed across both procedures as ERP continued. Disruptive behavior rates suggest an 83.33% improvement for Procedure 1 and a 54.17% improvement for Procedure 2 when comparing the first trials of the terminal steps (trials 86 and 109) for each respective procedure compared to the final five trials of the same procedure. For Procedure 2, only two additional trials were conducted following reaching the terminal step. Despite the lower percent reduction of disruptive behavior with Procedure 2, it is worth noting that LeRoy progressed from refusing to put on lead stickers prior to treatment to tolerating lead stickers placed on his body for 20 min.

Discussion

Results from the current study served as a replication and extension of Edelstein et al. (2021). Child rates of disruptive behavior decreased and appropriate waiting behavior increased in the presence of delayed gratification (i.e., wait intervals). Further, child distress tolerance and parental implementation of differential reinforcement resulted in increased tolerance for previously aversive medical procedures. Although LeRoy engaged in low rates of disruptive behavior during FCT and wait training, these phases of treatment were likely critical to successful ERP outcomes when considering child and parent factors. LeRoy was able to learn an alternative, replacement behavior that he could use to communicate his needs in a manner less effortful than tantrum behavior. His demonstrated tolerance for delays to reinforcement likely increased the effectiveness of exposures by allowing him to attend to aversive stimuli without distractor items. Further, parents' improved tolerance of LeRoy's distress, as indicated by decreased parental accommodation (i.e., strong procedural fidelity), likely improved their

Figure 1

Treatment Evaluation of FCT, Wait Training, and ERP. Note. *The three-panel graph above displays wait durations, exposure durations, and disruptive behavior responses per minute for each trial.*



successful implementation of differential reinforcement procedures within ERP.

Given the frequently reported role of parental accommodation in the maintenance of children's anxious behavior (e.g., Lebowitz et al., 2012), it is likely necessary to systematically build parental tolerance around contingency management and follow-through. This may especially be the case when children and parents find events equally aversive (e.g., medical procedures). In the case of LeRoy, it may have been easier for parents to develop their distress tolerance in the context of normative childhood challenging behavior (i.e., tantrums around restricted access) rather than tantrums secondary to aversive and invasive medical procedures for which distraction techniques may have been unsuccessful given the frequency of procedures. Future research should continue to investigate potential child and caregiver prerequisite skills that, when mastered, might increase intervention effectiveness. A limitation of the current study is the lack of baseline data on disruptive behavior in the context of aversive medical procedures; however, the increase in responses per minute observed upon the start of exposures provides some evidence for an escape function and LeRoy's tantrums being multi-operant. Additionally, direct data on parental procedural fidelity were not collected, preventing causal inferences to be made pertaining to treatment impacts on parental accommodation. Direct measurement of parental dependent measures would be useful in future replications for drawing such inferences. The treatment procedures described in the current study represent a potential pathway for teaching children and caregivers' prerequisite skills that increase the likelihood of ERP procedures resulting in therapeutic outcomes for children with disruptive behavior and medical anxiety.

Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author(s) received no financial support for the research, authorship, and/or publication of this article.

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