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Brief treatment analysis for elopement in an outpatient clinic setting

LaKaren Deann Rickman
University of Iowa

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BRIEF TREATMENT ANALYSIS FOR ELOPEMENT
IN AN OUTPATIENT CLINIC SETTING

by

LaKaren DeAnn Rickman

An Abstract

Of a thesis submitted in partial fulfillment of the requirements
for the Doctor of Philosophy degree in
Psychological and Quantitative Foundations (School Psychology)
in the Graduate College of The University of Iowa

July 2011

Thesis Supervisors: Associate Professor Kathryn C. Gerken
Professor David P. Wacker

ABSTRACT

Elopement is a potentially dangerous behavior that can result in accidental injury or death. Assessment and treatment of elopement in children has most frequently been examined using behavioral approaches. Most of these evaluations have typically been conducted in settings where assessment and treatment occurred over extended periods of time (such as inpatient units, residential treatment centers, or day treatment programs). As more children present for assessment and treatment of elopement in outpatient clinics, a need exists for efficient and pragmatic means of assessing and treating elopement. This study examined a novel way to assess and treat elopement behavior in young children in an outpatient setting. The purpose of the current study was to address three questions: (a) Could a brief methodological approach be used for rapidly assessing and treating elopement in young children within typical outpatient time constraints, (b) could a competing stimuli treatment including brief preference assessments, differential reinforcement of alternative behaviors, and response cost reduce elopement attempts and increase latency to elopement, and (c) could the initial treatment protocol be expanded to further clarify effective treatment strategies through component analyses? Data were collected within a brief multielement (across conditions) design combined with multiple baseline (across 2 participants). The results of this study suggested that (a) a brief methodological approach to assessing elopement can be successfully implemented within typical outpatient constraints, (b) the competing stimuli treatment can be used to reduce elopement attempts and increase latency to elopement in young children, (c) supplementing the initial protocol with a component analysis can further specify effective treatment strategies. These results extend the elopement literature by assessing and treating elopement within typical outpatient clinic setting time constraints.

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CERTIFICATE OF APPROVAL

PH.D. THESIS

This is to certify that the Ph.D. thesis of

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To my Savior
whose
grace is sufficient
mercy endures forever
and love is unfathomable
There is none like you

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CHAPTER I

INTRODUCTION

The major purpose of this study was to develop a protocol for rapidly assessing and treating elopement in young children evaluated in outpatient behavioral clinics. Secondary purposes were (a) to develop pragmatic treatments that increase young children's latency to elopement and reduce the number of elopement attempts the children engaged in, and (b) to expand the protocol by examining variations in the assessment and treatment methodologies initially used. This chapter is divided into four sections. The first section defines elopement, examines it as a risk behavior, and describes its occurrence in young children. The second section describes previous and current methods and trends in assessing and treating elopement. The third section describes brief methodological designs and strategies which may help reduce assessment and treatment times for elopement. Finally, the fifth section describes the purpose of this study and the research questions.

Elopement

Elopement has been defined as repeated attempts to leave designated areas without permission or supervision (Bodfish, 1992), the act of an individual running or walking away from a caregiver without consent (Tarbox, Wallace, & Williams, 2003), and leaving an area without supervision or caregiver permission (Lang et al., 2009). It is a potentially dangerous and life-threatening behavior that causes great concern to parents and caregivers of young children because children may inadvertently place themselves in dangerous situations (e.g., running into the street). These situations can result in unintentional childhood injury or death.

In the United States, unintentional injuries are the leading cause of death and hospitalization during childhood (CDC National Center for Health Statistics, 2007) and are one of the most under-recognized public health problems occurring in the United States (Borse et al., 2008). In fact, more children die each day from a preventable injury

than from deaths to all childhood diseases combined (Sleet, Schieber, & Dellinger, 2002). Danesco, Miller, and Spicer (2002) estimated that between 1987 and 1994, the United States spent approximately \$17 billion annually on medical costs for injuries requiring medical attention or resulting in restricted activity for the approximately 20 million children and adolescents injured each year. Borse et al. (2008) suggested that unintentional childhood injuries should be examined from a public health perspective to demonstrate that unintentional injuries are predictable, preventable, and controllable. Given this, it may be beneficial to identify specific classes of risky behavior that contribute to unintentional injuries and intervene to reduce their occurrence. Identifying interventions that minimize the potential unintended injuries that can result from elopement behavior is one way of achieving this goal.

To date, few data exist which examine the prevalence of elopement behavior in young children. There is extensive research that suggests that young children (ages 1 to 5 years) often possess many of the attributes associated with increased risk for unintentional injuries (Borse et al., 2008; Damashek et al., 2005; Karazsia & van Dulmen, 2010; Morrongiello & Matheis, 2004). These attributes such as poor inhibitory control, temperament characteristics, and sensation seeking all increase a child's risk for sustaining unintentional injuries (Schwebel & Bounds, 2003) and are very common during early childhood. However, to date, these attributes have not been directly linked to elopement in the literature.

Elopement behavior has been linked to certain populations (Jacobson, 1982; Lang et al., 2009; Lowe et al., 2007). An increased prevalence of elopement behavior in developmentally delayed populations has been well documented in the literature. Jacobson (1982) estimated that elopement was prevalent in 4.9% of a population of more than 30,000 individuals who received services for developmental disabilities. Additionally, Lowe et al. (2007) found that elopement was prevalent in 75% of children identified to have some form of learning disabilities. Moreover, preliminary findings in a

recent Interactive Autism Network (2011) report found that children from 4-10 years with Autism Spectrum Disorder (ASD) eloped at rates four times higher than their unaffected siblings. Although elopement is prevalent in both typically developing and developmentally delayed populations, most literature examining elopement has focused on developmentally delayed populations. This trend is also true with regard to research examining assessment and treatment of elopement.

Trends in Assessing and Treating Elopement

Prior research examining assessment and treatment of elopement has been limited; however, most existing research is primarily comprised of behaviorally based methods and suggests that elopement may be maintained by operant social contingencies (Kodak, Grow, & Northup, et al., 2004; Perrin, Perrin, Hill, & DiNovi, 2008; Piazza et al., 1997; Rapp, Vollmer, & Havonetz, 2005; Tarbox et al., 2003). Studies examining assessment and treatment of elopement used both experimental and non-experimental methodological approaches. Historically, assessment and treatment of elopement has occurred in intensive service delivery settings such as inpatient units, residential treatment centers, and day treatment programs (Bowman, 1996; Garner, 1990; Hargett & Webster, 1996; Piazza et al., 1997; Tarbox et al., 2003; Thorne, 1947).

Initial studies examining elopement were primarily non-experimental designs (Bowman, 1996; Garner, 1990; Hargett, 1996; Thorne, 1947). They included treatments which typically addressed operant contingencies, but did not experimentally manipulate these contingencies. These studies generally included extensive assessment and treatment periods, ranging from 1 week to greater than 7 months. Subsequent research on elopement continued trends of evaluating elopement in intensive service delivery settings. However, they often employed experimental study designs in which they systematically manipulated operant contingencies during assessment, treatment, and/or both (Chambers, Sanok, Striefel, 1980; Kodak et al., 2004; Perrin et al., 2008; Piazza et al., 1997; Rapp, Vollmer, & Havonetz, 2005; and Tarbox, Wallace, & Williams, 2003).

The incorporation of functional analysis methodology in the assessment of elopement behavior became an enduring trend for informing treatment strategies for elopement (Falcomata, Roane, Feeney, & Stephenson, 2010; Kodak et al., 2004; Lange et al., 2010; Perrin et al., 2008; Piazza et al., 1997; and Tarbox, Wallace, & Williams, 2003). This method of assessing elopement requires extensive resources and a substantial time commitment which make is impractical in an outpatient clinic setting.

For example, Piazza, Hanley, Bowman, Ruyter, Lindauer, and Saiontz (1997) studied the role of operant contingencies in maintaining elopement with three children diagnosed with developmental disabilities. They conducted functional analyses of elopement for participants referred primarily for the assessment and treatment of elopement. The participants were admitted to an inpatient unit specializing in the assessment and treatment of destructive behavior. The researchers used functional analyses based on procedures described by Iwata et al. (1982/1994) with modifications in which they attempted to simulate the natural environment setting where the child typically engaged in elopement. Therefore sessions lengths were 10 minutes each.

After conducting the functional analyses with each participant, it was necessary to augment the functional analyses with reinforcer assessments and clarify the contingencies maintaining elopement for two of the participants. Next treatment assessments including noncontingent reinforcement (NCR), differential reinforcement of appropriate (DRA) walking, and differential reinforcement other (DRO) behaviors were implemented for each participant. These assessment and treatment methods resulted in reducing elopement to near-zero levels. However, the time expended on this methodological approach to assessing and treating elopement ranged from 9 to 12.5 hours across participants. This time commitment well exceeds the typical outpatient clinic time allotment of 90 minutes.

Recognizing this dilemma, Perrin, Perrin, Hill, and DiNovi (2008) used the brief functional analysis methodology described by Northup et al. (1991) to assess and treat

elopement within typical outpatient time constraints. They conducted brief functional analyses with two preschoolers with developmental disabilities and successfully reduced assessment and treatment periods to two days. The functional analyses were all conducted over two blocks of time (morning and afternoon) on the first day and treatment analyses were conducted on the second day. The researchers were unable to clearly determine the function maintaining elopement after conducting a functional analysis for one of the two participants.

After the functional analyses were completed the researchers conducted treatment analysis including noncontingent reinforcement (NCR), extinction, and functional communication training (FCT). Treatment for both participants resulted in lower rates of elopement as compared to baseline. Perrin, et al. (2008) successfully reduced the assessment and treatment time involved in evaluating elopement; however, the time required to conduct their evaluations was still well beyond the length of an outpatient appointment which is typically between 60-90 minutes. This dilemma creates unique constraints for evaluating and treating elopement in an outpatient setting.

Recent trends in assessing and treating elopement have also demonstrated a need for versatile methods of assessing and treating elopement behavior to accommodate the variety of ways in which individuals engage in elopement. A need for research examining flexible methodologies that can be used in a variety of settings has emerged. Many of the established methods used to assess and treat elopement may be impractical for use in less intensive service delivery settings (e.g., school settings, brief outpatient settings). Additionally, a need exist for assessment and treatment methodologies that are efficient and simple for caregivers to implement and use independently. These needs have been demonstrated in recent studies examining assessment and treatment of elopement in less intensive service delivery settings, such as brief outpatient clinics and school settings (Barnett et al., 2006; Gibson et al., 2010; Lang et al., 2010; Perrin et al., 2008).

Elopement is of an increasing concern in schools. In addition to the previously mentioned physical risk, elopement also can limit the amount of instruction a child receives and be very disruptive within a classroom setting (Perrin et al., 2008). Developing methodologies for assessing and treating elopement that are appropriate for a school setting is crucial to maximizing the academic attainment of children who engage in elopement behavior. Researchers have examined new approaches to assessing and treating elopement in less intensive service delivery settings (Barnett et al., 2006; Gibson et al., 2010; Lang et al., 2010; Perrin et al., 2008). In doing so, these researchers have developed novel interventions to accommodate the specific needs of schools and/or developed approaches for examining elopement that can easily be utilized in schools or lower intensity service delivery settings.

Barnett et al. (2006) applied methodological assessment and treatment strategies to elopement that were traditionally used for academic concerns. They examined the application of a Response to Intervention (RTI) approach to elopement in a young child in a preschool classroom setting. Tiered interventions were used to reduce elopement behavior including (a) Tier 1: Classwide interventions in which teachers use of Positive Behavioral Support; (b) Tier 2: Group interventions for students not responding to the classwide interventions which were embedded into their students daily curriculums; and (c) Tier 3: Intense and individualized interventions for students not responding to the group and embedded interventions. With all three levels of interventions implemented elopement behavior was reduced to zero levels and maintained for the participant in the study.

Gibson et al. (2010) examined the benefits of technology in treating elopement by examining the use of desktop video conferencing to treat the elopement behavior of a young child in a preschool classroom. A reversal design was used to evaluate the use of functional communication training to reduce the child's elopement behavior during circle time. The child was trained to request access to preferred items during circle time and he

was allowed to keep or exchange the item for other items contingent on his nonengagement in elopement behavior. Intervention development, data collection and teacher training were all conducted via video conferencing after an initial on site consultation was provided. Results demonstrated that teachers were able to implement the treatment intervention with a high degree of fidelity and that the child's elopement behavior was significantly reduced during the treatment periods.

These studies demonstrated specific attempts to address the unique needs of the setting when evaluating elopement. They also showed that elopement can be effectively treated in less intense service delivery settings. The need for efficient assessment and treatment approaches is vital in less intensive service delivery settings. One approach to addressing these needs may be incorporate brief methodological designs and strategies into the assessment and treatment elopement.

Brief Methodological Designs and Strategies

Most of studies examining the assessment and treatment of elopement utilized methodological approaches which necessitated that elopement evaluations were conducted in intensive mental health service delivery settings. Settings such as residential treatment facilities, inpatient hospitalization, and day treatment programs were customary when assessing and treating elopement. They allowed assessment and treatment to occur over extended periods of time, with considerable resources, and with various professional staff conducting the treatment. As noted above, literature examining elopement over the past decade has demonstrated a need for pragmatic and efficient means of assessing and treating elopement, as well as flexible and versatile methodologies which can be implemented in diverse settings (Barnett, et al., 2006; Gibson et. al., 2010; Kodak et al., 2004; Lang et al., 2010; and Perrin et al., 2008).

The dilemma of time creates unique constraints for evaluating and treating elopement in an outpatient setting. Brief methodological approaches offer promising efficiency for outpatient use. Cooper et al. (1992) developed a brief methodological

approach for assessing and treating problem behavior in an outpatient setting which may be useful in the assessment and treatment of elopement. Their approach demonstrated the methodological advantages of ending assessment probes after identification of effective treatment components. This was done by using a brief multielement design to rapidly probe treatment components and immediately replicate effective treatments rather than replicating all assessment conditions. These methods are particularly well suited for outpatient clinic settings because effective treatment components can be identified and tested quickly allowing for more of the evaluation to be focused on treatment of the problem behavior rather than assessment.

An important factor in the success of many brief designs is the effective identification of alternative stimuli to compete with problem behavior. Previous studies have suggested that differentially reinforcing an alternative stimulus contingent on the occurrence of appropriate behavior is a viable technique for reducing problem behavior (Poling & Ryan, 1982; Ringdahl, Vollmer, Marcus, & Roane, 1997; Vollmer & Iwata, 1992). Alternative stimuli are often identified with a preference assessment. Preference for items (identified through preference assessments) has successfully been used to treat aberrant behavior in the absence of a clearly identified function for the behavior (Derby et al., 1995; Piazza, Fisher, Hanley, Hilker, & Derby, 1996; Ringdahl et al., 1997). Furthermore, Roane, Vollmer, Ringdahl, and Marcus (1998) demonstrated that brief preference assessments could be used to identify stimuli functioning as reinforcers and were associated with fewer problem behaviors in less time than traditional preference assessments that are more time consuming. This brief approach offers an efficient and effective method for assessing preference in an outpatient setting. It also offers a useful method for identifying stimuli to compete with elopement behavior within typical outpatient time constraints.

Purpose of the Study

This study addressed the dilemma of outpatient time constraints by developing treatments for elopement based on experimental treatment analyses conducted during outpatient appointments. This approach offers a pragmatic method for evaluating elopement in an outpatient setting within typical outpatient time constraints. It allows clinicians to intervene with participants prior to their engagement in elopement behavior and to experimentally test the viability of identifying reinforcers that compete with those maintaining the elopement behavior. With this method, functions maintaining elopement behavior were not experimentally identified, but rather competing stimuli were used to minimize elopement behavior.

The present study addressed three research questions. The first question asked if a brief methodology could be used to assess and identify treatments for elopement in a typical outpatient clinic time restraint. This question was addressed by conducting brief trials of participants' elopement behavior under baseline and treatment conditions. All trials were conducted in traditional 90-minute outpatient clinic sessions. Trials were conducted in settings similar to the situations and settings in which parents reported their child typically eloped. Assessment trials consisted of obtaining baseline data on participants' elopement attempts and latency to elopement without intervention. Treatment trials were similar, but also included a treatment intervention consisting of differential reinforcement of an alternate behavior (DRA) with a response cost (RC). The investigator hypothesized that a protocol combining a brief preference assessment and brief treatment analyses could be efficiently used to identify effective treatment components for elopement within typical outpatient clinic time constraints (90 minutes).

The second question asked whether the treatment intervention would result in increased latency to elopement and decreased elopement attempts for participants. This question was addressed by implementing a treatment in which participants were allowed to choose relatively preferred items identified during a preference assessment to keep

with them during treatment trials. Participants were informed that they would be allowed to keep the preferred item as long as they remained with their parents (DRA); however, if they eloped, the preferred item would be removed (RC). Data on latency to elopement and elopement attempts were collected and compared to baseline conditions. It was hypothesized that latency to elopement would increase under treatment conditions when compared to baseline conditions. It was also hypothesized that the number of elopement attempts would be reduced under treatment conditions when compared to baseline.

The third question asked if the previously described protocol could be effectively expanded to address the idiosyncratic variances of participants, which could further specify treatment strategies and recommendations. This question was addressed by examining variations in the methodology of the protocol with additional participants. In two additional participants, the initial DRA and RC protocol was expanded to include a treatment component analysis using additional strategies (i.e., hand holding and using a child harness) that the participants' parents were currently using to minimize elopement behavior. It was hypothesized that these expansions would result in reduction in elopement attempts and increases in latency to elopement.

CHAPTER II

LITERATURE REVIEW

Research examining elopement has been both limited and sporadic. Therefore, this literature review included research spanning the past 60 years in order to adequately review the history of assessment and treatment of elopement in the scientific literature. Articles reviewed for this study were limited to those that focused specifically on assessment and treatment interventions to reduce elopement behavior and that described the methods used to examine elopement behavior. The literature was reviewed from a historical perspective, examining the progression of practices used to assess and treat elopement. The following distinctions in the historical context are explored in this review of literature: initial studies examining elopement, incorporation of experimental design in the assessment and treatment of elopement, and novel methods and considerations in assessing and treating elopement in school settings.

Initial Studies Examining Elopement

Prior to 1970, most scientific literature examining elopement focused primarily on the context of youths who ran away and/or individuals with psychiatric/mental illnesses (Adams & Munro, 1979; Borens, 1974). Most of these articles attempted to explain and predict elopement behavior (Cooke & Thorwarth, 1978; Johnson & Carter, 1980). Early literature addressing the assessment and treatment of elopement primarily examined elopement in adults with intellectual disabilities (Bowman, 1996; Garner, 1990; Thorne, 1947); however, literature examining children did exist (Chambers et al., 1980; Hargett, 1996). Most early research used non-experimental assessment methodologies (descriptive and observational) design procedures when assessing and treating elopement and occurred in settings with extensive resources such as residential treatment centers or inpatient settings (Bowman, 1996; Garner, 1990; Hargett, 1996; Thorne, 1947).

A need for assessing and treating elopement was identified in the literature as early as 1947 by Thorne. He examined the elopement behavior of 39 individuals

(ranging in age from 10-44 years) diagnosed with intellectual disabilities. All of the participants lived at a residential facility for individuals with intellectual disabilities and frequently engaged in elopement behavior. Each participant's elopement behavior was assessed through a formal interview conducted by a psychiatrist to determine the motivation for eloping. Results from the interviews suggested that participants primarily eloped due to suggestions to elope (from other patients) and to avoid and/or escape aversive social situations (e.g., teasing). Thorne's treatment intervention included punishment (1 week in isolation following a participant's third elopement) and environmental changes (unit staff directed to adjust interactions with participants to reduce unpleasant living conditions).

Thorne's (1947) treatment resulted in a reduction of elopement behavior. Seventy-four percent of the participants did not engage in elopement more than twice after implementation of the intervention. Although the specific procedures Thorne used were vaguely described (e.g., specific changes staff made), his work denoted a departure from examining elopement primarily from an insight-oriented psychotherapy perspective. His work made three major contributions to the elopement literature. First, it transitioned the literature to an interventional perspective of elopement. Second, it established precedence for consideration of environmental contingencies in influencing elopement behavior. Finally, it initiated trends for assessing and treating elopement within an inpatient/residential setting over extended periods of time.

It was over 30 years before subsequent research examining assessment and treatment of elopement would immerge. In 1980, Chambers et al. examined elopement in a typically developing 8-year-old male placed in a university-affiliated treatment center. The participant was placed in a self-contained classroom at the center due to regular engagement in verbal and physical aggression, out-of seat behavior, and elopement. Assessment procedures included conducting teacher and staff interviews and collecting baseline elopement data. Treatment consisted of implementing a multi-component

program that included a point system, time out, and restricted levels of freedom ranging from severe restriction of movement in the classroom to near normal freedom of movement within the classroom with one-to-one supervision from an aide. When the student successfully progressed through all of the levels, a modified levels system was implemented that allowed normal movement within the classroom during the day with reduced one-to-one aide contact.

Chambers' treatment program resulted in a reduction of elopement attempts from a mean of 6.5 times per week during baseline to a mean of .67 times per week during the initial treatment strategies and a mean of .45 times a week during the modified levels treatment strategies. By 23 weeks of treatment, the participant's elopement behavior had been reduced to zero-rate elopements levels and remained at zero-rate throughout the duration of treatment. Later follow-up probes revealed near zero-rate levels (a mean of .37 times per week) of engagement in elopement behavior. The work of Chambers et al. (1980) is significant in that it is the first study in the elopement literature to experimentally examine a treatment program. The researchers used a partial withdrawal (ABCBCD) design. It also represents the first research in the literature to examine elopement in a child. Their work demonstrated that manipulation of environmental/operant contingencies could result in changes to elopement behavior and established precedence for the use of multi-component treatment interventions.

Garner (1990) used a similar methodology to examine elopement behavior in a 19-year-old diagnosed with profound mental retardation, although he did not experimentally examine the participant's treatment. Garner's assessment involved descriptive methods (reviewing previous treatment strategies and interviewing the group home's direct care staff). He hypothesized that the participant's elopement was attention maintained due to an increase in elopement behavior following a previously attempted extinction-based treatment intended to reduce escape-maintained behavior from demand situations.

Garner (1990) implemented a multi-component treatment program that included increases in freedom of movement throughout the group home (contingent upon non-engagement in elopement), training the participant to stop when told to do so by group home staff, time out for elopement attempts, and verbal praise for appropriate requests to go outside. Elopement was successfully reduced from an average of 131 times per month to 21 times per month during the first month. Additionally, elopement was completely eliminated (reduced to 0 elopement attempts) by the seventh month of treatment. Elopement behavior occurred at very low rates throughout the remainder of the treatment period. Garner demonstrated the efficacy of reducing elopement attempts through a multi-component treatment program that manipulated operant contingencies. His treatment, which lasted for a 15-month period, also followed the trend of extensive time periods for treating elopement.

Bowman (1996) further extended the literature on elopement by examining elopement in a 45-year-old male diagnosed with Down syndrome and Dementia. On average the participant eloped five times per month from a residential facility in which he had lived for over 30 years. Bowman referenced the use of functional analysis to determine contingencies maintaining elopement; however, no methodology and/or data were described or presented in the article. Bowman hypothesized that the participant's elopement was maintained by escape and attention, suggesting that the participant eloped to escape from work tasks and to access attention received from the facility staff during the car ride after he was retrieved from elopement events. Bowman's treatment initially involved a multi-component treatment program that included restriction of attention by eliminating car rides following elopement incidents, provision of praise (every 15 minutes) and breaks (with access to preferred items) during work periods, and reinforcing non-engagement in elopement with car rides. Upon the participant's continued engagement in elopement behavior, Bowman later incorporated additional car rides with staff and implemented response priming (influencing the response to a question by

repeatedly presenting the question along with the desired answer) by teaching the participant to respond, “Don’t run away,” when asked how he could earn car rides.

After Bowman (1996) implemented the two additional strategies, the participant’s elopement attempts were immediately reduced to two times per month. One month later, elopement attempts were reduced to once a month and elopement attempts were completely eliminated (0 elopement attempts) within 3 months. These reductions in elopement attempts were not maintained, and the participant’s elopement behavior returned within 6 months. Bowman suggested that the participant’s elopement behavior may have been complicated by his Dementia and that it recurred due to infrequent response priming from staff.

Bowman’s (1996) work demonstrated some of the unique challenges of treating elopement. First, given the potential dangers associated with elopement, it is rare that treatment programs can include strategies to ignore the behavior or put it on extinction. Second, it may not be possible to completely restrict access to reinforcement received from eloping (e.g., attention after retrieval); therefore, treatment programs may need to manipulate the rate of reinforcement the individual has access to or develop alternative reinforcers to compete with those maintaining the elopement behavior. Lastly, given the need for consistent implementation across staff and/or caregivers, programs developed to treat elopement must be pragmatic and easily integrated into daily activities to maintain treatment integrity.

Hargett and Webster (1996) examined the use of a graduated exposure behavioral intervention to treat elopement behavior in a 7-year-old male. The participant consistently engaged in school refusal and elopement (ran away from school) when taken to school against his will. Assessment included collecting 5 days of baseline data, conducting comprehensive psychological testing, and conducting clinical interviews with the child’s parents and teachers. These assessments suggested that the participant’s

elopement behavior was maintained by negative reinforcement (escape from aversive social interactions at school including teasing and poor peer interactions).

Initially, Hargett and Webster (1996) implemented a gradual exposure treatment program (with the participant attending for a few hours a day with the intent to gradually increase his time at school) with positive reinforcement provided for staying in school. By the end of the second week of treatment, reassessment of the participant's behavior suggested that his school refusal and elopement behavior might be maintained by positive reinforcement (access to parental attention and tangible items) that he received at home when he eloped or refused to go to school. This finding led to changes in the treatment program in which the participant was denied access to positive reinforcement in his home (e.g., if he refused to go to school and/or eloped from school, he was picked up by his maternal grandmother and immediately taken to the school).

Following these changes, the participant's school refusal and elopement behavior decreased. He was then rapidly exposed to school (required to attend a full day) and successfully attended school with no school refusal all day for 5 days a week by the third week of the intervention. By the fourth week of the intervention, the participant continued his attendance at school without refusal and also did not have any elopement attempts. Treatment strategies remained in place for the next 7 months until the end of the school year. The participant maintained the attendance gains without elopement attempts, and no problems with social relationships, peer relationships, or conduct were noted during this time period or in follow-up probes conducted during the beginning of the next school year.

Hargett and Webster (1996) demonstrated the importance of identifying operant contingencies that influence elopement in order to design effective treatment programs. The initial treatment program was based on hypothesized contingencies that later appeared to be ineffective in influencing the participant's behavior. This delayed treatment progress resulted in additional loss of instruction for the participant, and

increased frustration among school officials and the participant's family. It also demonstrated an ongoing need in the elopement literature to further examine identify operant contingencies and the benefits of experimentally identifying functions of behavior.

The literature examined in this section established many trends in the field for assessing and treating elopement. The research discussed above initiated a transition in the scientific literature away from the focus of explaining and predicting elopement behavior to examining methodologies for assessing and treating elopement. Although Chambers et al. (1980) used experimental methods to assess and treat elopement, most of the research from this period relied primarily on non-experimental methodology to assess and treat this behavior. These studies established descriptive methods (interviewing participants and/or caregivers) and direct observation as a primary means of assessing elopement behavior, and most initiated the use of multi-component treatment packages as the primary form of intervention. All of this work provided a precedence for extensive intervention approaches that included extended treatment periods and intensive service delivery settings (e.g., residential and/or inpatient treatment settings) that allowed extensive access to participants. Finally, the early literature examining elopement suggested that elopement behavior may be influenced by operant contingencies and demonstrated a need for further assessment of these contingencies.

Experimental Design in the Assessment and Treatment of Elopement

The major contribution of subsequent research in elopement expanded the field by experimentally examining the influence of operant contingencies. This research transitioned the literature to experimental design methods of assessing and treating elopement. Behaviorally based methods continued to dominate the treatment of elopement, and experimental design methods (e.g., multiple baseline, multi-element, and reversal designs) offered researchers concrete means of examining the influence of

operant contingencies. Researchers applied these methods to elopement and ushered in the era of experimental assessment and treatment of elopement (Kodak et al., 2004; Piazza et al., 1997; Rapp et al., 2005; Tarbox et al., 2003). Additionally, a previously developed technology (i.e., functional analysis) within the field was applied to elopement research.

Functional analysis offered promising assessment methods for experimentally examining elopement, and it quickly became the foremost experimental tool for assessing elopement behavior and informing treatment (Kodak et al., 2004; Piazza et al., 1997; Tarbox et al., 2003). Assessment and treatment variations in experimental methodology also emerged in the literature during this period (Kodak et al., 2004; Perrin et al., 2008; Rapp et al., 2005). However, research conducted in more intensive mental health settings (e.g., outpatient day treatment, inpatient units, day camps) remained the primary service delivery setting and are discussed in this section. Research examining alternative service delivery settings (e.g., schools) and methods is examined in the next section.

Piazza et al. (1997) established precedence for using functional analysis to assess elopement behavior and inform treatment interventions. The researchers studied the role of operant contingencies in maintaining elopement with three children (ages 4, 10, and 11 years) diagnosed with developmental disabilities. Each child had been referred primarily for assessment and treatment of elopement. Functional analyses of elopement were conducted for each child on an inpatient unit specializing in the assessment and treatment of destructive behavior. The functional analyses were based on procedures described by Iwata et al. (1982/1994) with modifications in which the researchers attempted to simulate the natural environment setting in which the child typically engaged in elopement. Given the danger the child could be exposed to while eloping, the child's behavior could not be ignored. Therefore, the child was retrieved on a fixed schedule across all conditions when elopement occurred. Functional analysis conditions were

included and excluded based on caregivers' reports of the types of situations during which the child generally eloped.

After conducting the functional analyses with each child, Piazza et al. (1997) identified the maintaining reinforcer for elopement for one child in their study. Elopement behavior was maintained under both tangible and attention conditions. Treatment for this child involved differentially reinforcing other (DRO) behaviors in which the child had access to tangible items and attention contingent on the nonoccurrence of elopement. With the remaining two children, the researchers augmented the functional analyses with reinforcer assessments to clarify the reinforcers maintaining elopement. Tangible and attention reinforcers, respectively, were identified as maintaining elopement in the children. Next, treatment assessments using noncontingent reinforcement (NCR) with access to tangible items and differentially reinforcing appropriate (DRA) walking were implemented for these two children. Treatment assessments for all three children resulted in reducing elopement to near-zero levels.

Piazza et al. (1997) demonstrated the first attempt to experimentally assess elopement behavior and identify the function of the behavior through functional analysis. The researchers' work extended beyond findings of the influence of operant contingencies in earlier literature with elopement to suggest that elopement behavior may be maintained by operant social contingencies. Their systematic and experimental methodology provided evidence that elopement could be treated with interventions that manipulated operant social contingencies (Lang et al., 2009). It also maintained the long established precedence of treating elopement in an extensive treatment setting (e.g., an inpatient unit) over an extended amount of time.

Tarbox et al. (2003) replicated and extended the findings of Piazza et al. (1997) with three participants (ages 6, 28, and 39 years) diagnosed with developmental disorders. Similar to Piazza et al. (1997), the researchers used a modified functional

analysis based on procedures by Iwata et al. (1982/1994) to evaluate and treat elopement. As with Piazza et al. (1997), the participants were retrieved across all conditions to ensure their safety. The researchers extended the elopement literature by conducting functional analyses in settings that resembled those in which elopement typically occurred (e.g., an indoor mall and a vocational day program) and on an outpatient basis. Four to eight 10-minute sessions were conducted daily. A confederate was used to follow the participants and ensure that they remained safe during times when the therapist was not attending to them. The researchers also utilized participants' primary caregivers as therapists during the treatment analysis.

Results of the functional analyses suggested that tangible conditions maintained elopement behavior in two participants and that attention maintained elopement in the third participant. During the treatment analyses, the researchers used functional communication training (FCT) for the two participants with tangible-maintained elopement behavior. The treatment resulted in low levels of elopement being displayed by both participants. A noncontingent reinforcement (NCR) treatment was used for the participant with attention-maintained elopement behavior. The treatment resulted in no elopement occurring in the initial NCR phase and a near-zero level of elopement in the second NCR phase of treatment. This work expanded elopement research beyond contrived settings and represents the first attempts to assess and treat elopement on an outpatient basis.

Kodak et al. (2004) further replicated and extended the literature on elopement by conducting modified functional analysis procedures with a 5-year-old girl diagnosed with Attention-Deficit Hyperactivity Disorder and who exhibited elopement behavior. Their study extended functional analysis methodology for elopement to outdoor natural settings (i.e., an outdoor sports activity setting). Additionally, Kodak et al. used a shortened session length in the functional analysis and treatment evaluation (5 minutes). This is the first example of the use brief assessment methodology in the elopement literature.

Results from the functional analysis indicated that elopement was reinforced by attention. Kodak et al. (2004) used noncontingent attention (NCA) and time out in their treatment assessment. Time out was used contingently upon the child eloping. The treatment was successful in reducing elopement to very low levels. Additionally, no elopement occurred during the final six treatment sessions. This work demonstrated the utility of shortened session lengths in both assessing and treating elopement behavior and expanded the literature in examining assessing and treating elopement in natural settings.

Rapp et al. (2005) contributed to the elopement literature by continuing expansions of experimental assessment and treatment methodology in natural settings. They assessed and treated a 14-year-old female diagnosed with Autism and severe Mental Retardation. The participant engaged in elopement behavior (along with other problem behaviors including flopping, face hitting, screaming, and choking) when asked to approach pools or other swimming areas. Assessment procedures included observations in the natural setting (e.g., at the pool). The researchers identified escape and avoidance of the swimming pool as the maintaining consequence for elopement. Rapp et al. (2005) implemented a treatment intervention that included the use of systematic desensitization over an 8-week period. The participant was progressively exposed to the pool (i.e., approach pool, sit in chair near pool, move chair toward pool, enter pool, stand in pool, and then swim in pool) and was reinforced with praise and/or small edibles after each step. Any attempt to elope was blocked during intervention.

The treatment intervention implemented by Rapp et al. (2005) resulted in elopement behavior (as well as all other problem behaviors) gradually decreasing to zero rate levels over the course of the treatment period. These results were maintained at a 10-month follow-up. This work is unique in that it represented a departure from functional analysis methodology as a primary means of assessing elopement. Rapp et al. (2005) demonstrated that naturalistic observation can provide valuable assessment information that could inform treatment. Additionally, this work demonstrated utility in investing

both time and resources in treatment analysis to reduce elopement behavior rather than dividing them between experimental assessment and treatment.

Perrin et al. (2008) further extended the elopement literature by demonstrating the utility of brief functional analyses in assessing elopement. They used the brief functional analysis methodology described by Northup et al. (1991) to identify the function of elopement within typical outpatient time constraints. They conducted brief functional analyses with two preschoolers with developmental disabilities. The functional analyses included control, toy play, attention, tangible, and escape conditions that were all conducted over two blocks of time (morning and afternoon). Assessment and treatment occurred across 2 days. Functional analyses were conducted on the first day and treatment analyses were conducted on the second day.

Perrin et al. (2008) found that the function maintaining elopement could not be clearly determined after conducting a functional analysis for one child in the study. Functional analysis results suggested that elopement was maintained by either social-positive reinforcement or automatic reinforcement. Treatment analysis for this participant included the use of noncontingent reinforcement (NCR) and extinction implemented within a pairwise design. The functional analysis for the second participant suggested that elopement was maintained by social tangible items and escape. The treatment analysis for this participant consisted of implementing functional communication training (FCT) and extinction for elopement. FCT included exchanging a “break card” to gain access to a break and a preferred toy. Treatment for both participants resulted in lower rates of elopement as compared to baseline.

The work of Perrin et al. (2008) made many significant contributions to the elopement literature. It recognized and addressed the need for brief methodologies in assessing and treating elopement. It also applied previously demonstrated methodology (e.g. brief functional analysis) to assessing elopement. This work also significantly reduced the amount of time used to assess and treat elopement and did so within the

confines of traditional outpatient time blocks. Finally, it demonstrated utility in reducing elopement behavior with this methodology.

Experimental methodology continues to dominate the elopement literature. This is demonstrated by the recent work of Falcomata et al. (2010). Falcomata et al. evaluated a treatment for elopement maintained by access to stereotypic door play in a 5-year-old male diagnosed with Autism. Assessment methodologies included conducting a functional analysis of elopement and subsequently an evaluation of hypothesized relationships. The functional analysis produced undifferentiated results and prompted the researchers to further examine the relationship between door play and elopement (in an elopement/door play evaluation). The results of the elopement/door play evaluation suggested that the participant eloped to gain access to door play. The researchers hypothesized that the door play behavior was maintained by automatic reinforcement. The elopement behavior was then experimentally treated with an FCT intervention. The treatment intervention included the participant's gaining access to door play contingent upon a card touch, blocking/restricting access to door play during occurrences of elopement, and delay fading to increase practicality for the participant's caregivers.

Falcomata et al. (2010) found that the FCT intervention decreased elopement when access to door play was provided contingent on appropriate communication and access to door play was blocked following occurrences of elopement. Rates of elopement were reduced to near zero levels during the FCT treatment intervention. Furthermore, the delay-fading procedures provided the participant's caregivers with practical means of controlling when and where the door play behavior would occur. This result contributes significantly to the research on elopement in that it demonstrates the value of pragmatic treatments that caregivers can be trained to implement and use effectively. It also demonstrated the merit in experimentally evaluating hypothesized relationships to assess elopement behavior.

The transition to experimental methodology in assessing and treating elopement brought several important contributions to the elopement literature. First, both experimental methods of assessing and treating elopement demonstrated that elopement behavior may often be maintained by operant social contingencies. Second, functional analysis emerged as a vital tool in assessing elopement. Third, variations in experimental methodologies proved to be valuable in expanding assessment and treatment to diverse service delivery settings and to naturalistic assessment and treatment settings. Finally, this literature broached practical concerns associated with assessing and treating elopement, including attempts to reduce the amount of time spent assessing and treating elopement as well as developing pragmatic treatments that caregivers could be trained to implement independently.

Assessing and Treating Elopement in School Settings

Although the transition to experimental methodologies in assessing and treating elopement routinely occurred in traditional mental health settings (e.g., specialized inpatient units, day treatment programs, and a variety of outpatient settings), contributions to the literature also came from school settings (Barnett et al., 2006; Gibson et al., 2010; Lang et al., 2010; Leaf, Dotson, Oppenheim, Sheldon, & Sherman, 2010; Lerman, Vorndran, Addison, & Kuhn, 2004; Olmi, Sevier, & Nastasi, 1997). Difficulties with elopement behavior in school settings prompted researchers to adapt previously demonstrated methodologies for educational settings (Lang et al., 2010; Olmi et al., 1997). Other researchers combined previously demonstrated methodologies with novel methodologies to meet the unique needs of educational settings (Barnett et al., 2006; Gibson et al., 2010). Many of these studies evaluated assessment and treatment of elopement within the context of multiple problem behaviors (e.g., noncompliance, aggression, etc.) making it difficult to determine if a specific methodology was employed to assess or treat elopement (Leaf et al., 2010; Lerman et al., 2004). For the purpose of

this study, only articles in which a specific methodology to assess and treat elopement could be determined were reviewed.

Olmi et al. (1997) assessed and treated elopement behavior (along with noncompliance, tantrum, and aggression) in a 4-year-old male with severe receptive and expressive language deficits within a nonexperimental design. Assessment methodology included obtaining information through teacher and caregiver reports and collecting data from a sample of the participant's classroom behavior via a 2-hour videotape. Assessment data suggested that the participant engaged in elopement behavior once every 5 minutes. Treatment intervention involved implementing a Time-In/Time-Out procedure in which the participant was provided increased praise contingent upon periods of non-elopement (Time-In) and moved to a location without adult attention upon engagement of elopement (Time-Out).

The treatment intervention resulted in elopement behavior being reduced to zero rates following three 1.5-hour intervention sessions. Maintenance checks at 2, 24, and 40 weeks revealed that these reductions were maintained. Olmi et al. (1997) suggested that increased opportunities for time-in reduced opportunities for time-out. This study demonstrated the value of brief assessment and intervention methodologies that could easily be employed in a school setting. It also demonstrated the use of one intervention to treat multiple behavioral topographies.

In 2006, Barnett et al. non-experimentally assessed and treated elopement behavior (in addition to noncompliance and aggression) in a 4-year-old female in a Head Start program using a Response to Intervention (RTI) approach. Assessment methodologies included curriculum-based screening and assessment, teacher and parent interviews, and direct observations. Assessment results suggested that center-time should be targeted for intervention. The intervention methodology included three tiers of intervention. Tier 1 interventions were classroom wide and provided to all students within the class. They included the development of classroom wide rules with a

consequence hierarchy, increasing and implementing positive teacher attention for engagement in rule following, and rotation of high interest activities during center time. Tier 2 included imbedding incidental social problem solving through teaching routines throughout the day and increased positive attention for the participant when engaging in appropriate behavior. Tier 3 incorporated an individual component strategy for the participant that included a Positive Behavioral Support (PBS) safety plan, social stories, and school-home notes.

The treatment intervention resulted in an immediate reduction in elopement behavior that was maintained throughout the course of treatment. Other behaviors were gradually reduced over time with intermittent increases following reduction. Barnett et al.'s (2006) study provided many implications for assessing and treating elopement in a school setting. It considered classroom-wide contexts and influence on elopement behavior. It also examined a decreasing intensity design with regard to maintaining reduction in elopement behavior. Finally, it explored a novel approach to assessing and treating elopement in order to identify methodologies that may be more appropriate within the context of an educational setting.

Gibson et al. (2010) also employed novel techniques for assessing and treating elopement in a 4-year-old male diagnosed with Autism in a preschool special education classroom. The researchers experimentally evaluated the impact of functional communication training on elopement by delivering consultation via desktop videoconferencing. Assessment methodologies included an initial face-to-face visit and functional assessment as well as a brief functional analysis. All planning, teacher training, and data collection were delivered via Skype. Based on teacher and aide interviews, the researchers hypothesized that the participant engaged in elopement behavior to gain access to preferred items in the classroom during calendar time. This was subsequently tested and confirmed using a brief functional analysis. An FCT treatment intervention was implemented in which the participant was trained to mand

(raising his hand) to gain access to preferred items during calendar time. If needed, the participant was physically prompted and guided to mand in order to gain access to a preferred item. When the participant manded (both independently and with prompting), he was allowed access to the preferred item throughout the duration of calendar time contingent upon non-engagement in elopement behavior. If the participant eloped, the preferred item was removed, the participant was returned to his seat, and the intervention sequence was repeated. The participant could also mand to receive access to a different preferred item throughout calendar time contingent upon non-engagement in elopement.

Elopement was reduced from a mean percentage of 96% during baseline intervals to 11% during treatment intervals. Upon reversal, elopement was reduced from a mean percentage of 93% under baseline conditions intervals to 5% under treatment condition intervals. This research demonstrated the incorporation of technology in delivering services to treat elopement in a school setting. It also exemplifies the value of simple pragmatic approaches to assessing and treating elopement. The assessment and treatment methods allowed for school staff to be trained and directed in implementing the methodologies with minimal time and staff resources.

Lang et al. (2010) experimentally assessed and treated elopement with a 4-year-old male diagnosed with Asperger syndrome in two school settings (classroom and resource room). Assessment included a brief functional analysis in both settings. Assessment results suggested that elopement was maintained by attention in the resource room and by access to tangibles in the classroom. Two different treatment interventions were implemented in both settings to examine these variations. Both treatments included noncontingent reinforcement (NCR) with the reinforcers identified in the functional analysis. Elopement behavior was ignored when it occurred. The attention-based intervention included the teacher maintaining close proximity to the participant, remaining oriented toward him for the entire session, and providing positive social attention (pats on the back and affirmative statements). The tangible-based intervention

included continuous and noncontingent access to a DVD, which was in the participant's view in the classroom. The teacher worked with other children or delivered instruction and did not interact with the participant.

The attention-based intervention in Lang et al. (2010) resulted in a reduction in elopement behavior from baseline levels in the resource room. The tangible-based intervention resulted in a reduction in elopement behavior from baseline levels in the classroom. This study demonstrated that elopement behavior could be maintained by different contingencies across settings within an individual. This work also extended elopement assessment research by empirically demonstrating the influence of setting on analyses of the variables that influence the occurrence of elopement. Therefore, it may be necessary to examine elopement across various setting in order to develop effective treatments. It also demonstrated that multiple treatment interventions may be necessary to treat elopement for an individual.

The advancement of research examining assessment and treatment of elopement in a school setting has made many important contributions to the elopement literature. It demonstrated the need to develop efficient, pragmatic, and novel methodologies for assessing and treating elopement. It also demonstrated a need for versatile methodologies that could be implemented to address multiple behavioral concerns. It established a need to develop flexible assessment and treatment methodologies that were appropriate for use and implementation in a school setting. Finally, it demonstrated the need to consider multiple roles of variables in maintaining elopement behavior across settings.

Summary

Elopement is a behavior that increases an individual's risk for experiencing potentially dangerous and life threatening situations. These risks can be minimized through effective management of elopement behavior. Research has found that thorough assessment and treatment of elopement can reduce its occurrence. The elopement

literature provides examples of both experimental and non experimental approaches to assessment and treatment that have reduced engagement in elopement behavior (Barnett et al., 2006; Bowman, 1996; Falcomata et al., 2010; Garner, 1990; Gibson et al., 2010; Hargett, 1996; Kodak et al., 2004; Lang et al., 2010; Perrin et al., 2008; Piazza et al., 1997; Tarbox, Wallace, & Williams, 2003; Thorne, 1947). Recent trends in assessing and treating elopement primarily rely on experimental methodologies and recent literature has demonstrated a need for further development of methodologies for assessing and treating elopement.

Traditional mental health settings dominate the elopement literature. Elopement has primarily been studied in settings that encompass extensive resources (e.g. inpatient units) and/or extensive time allotment (e.g., day treatment settings). The literature demonstrates a need for assessment and treatment methodologies that are efficient, versatile, and require minimal staff resources. Innovation in technology has led to novel approaches to assessing and treating elopement. Additional literature examining appropriate assessment and treatment methodologies for outpatient and school settings is needed. Limited time and resources in these setting warrant the development of pragmatic, efficient methodologies. These methodologies also need to be flexible and simple for ease of use and implementation.

Finally, the elopement literature indicates that current methodology can often be very arduous and complex. The literature suggests that researchers are aware of this and recognize a need to develop interventions which caregivers can be trained to implement effectively to maintain reductions in elopement behavior. The current literature demonstrates a need to incorporate more caregiver training and assess treatment integrity and acceptability with families. Further research is needed to examine effective assessment and treatment of elopement that can be simply incorporated into the daily lives of individuals who engage in elopement behavior and their families. By developing greater understanding of the variables necessary for assessing and treating elopement, we

will be better able to develop flexible, simple, efficient means of assessing and treating elopement and improve the lives of individuals who engage in elopement behavior.

Therefore this study examined the use of a brief treatment analyses protocol to assess and treat elopement in a brief outpatient setting in which parents conducted the treatment trials.

CHAPTER III

METHODOLOGY

Participants

Five children with primary concerns of frequent elopement behavior in community settings participated in this study. The children were evaluated in pediatric outpatient specialty clinics and were referred to the clinics because each met the following inclusion criteria: (a) ranged in age from 3 to 6 years, (b) was referred for assessment and treatment recommendations for problem behavior, and (c) engaged in elopement behavior on a daily basis across multiple settings that negatively impacted family routines or schedules.

David was a 4-year-old boy with a diagnosis of Developmental Delay, Not Otherwise Specified. He was referred for an evaluation of problem behavior including impulsive behavior and poor attention span. He reportedly engaged in elopement behavior in the form of running away from his parents in public settings such as stores and parking lots. David engaged in elopement behavior across settings (e.g., home, school, and community). David's parents reported serious concerns with several incidents in which he ran in front of moving cars in parking lots and became lost after running away from his parents in department stores. They reported that this behavior occurred so frequently that they no longer took him out into community settings unless absolutely necessary. During these outings, the family resorted to tying a rope around David's torso and chest to keep him from eloping as standard child harnesses (store bought) were ineffective in preventing elopement.

Kendal was a 4-year-old girl with no previous diagnoses or medical concerns. She was referred for evaluation of problem behavior including impulsive behavior. She reportedly ran off from her mother when at home, in community settings, and at school. This behavior was particularly troubling to Kendal's mother because when she ran off, she often placed herself in dangerous situations such as running into ongoing traffic in the

street and leaving areas with adult supervision. Additionally, Kendal had a younger brother who also required close supervision from her mother. This made it particularly difficult for Kendal's mother to keep both children safe while out in the community. Kendal's mother reported that Kendal generally engaged in these behaviors with various adults (e.g. parents, grandparents, and teachers).

Brian was a 4-year-old boy with diagnoses of Peter's Anomaly and Impulse Control Disorder (unspecified). He was referred for an evaluation of problem behavior including impulsive behaviors and noncompliance. Brian reportedly engaged in elopement behavior across multiple settings with various adults (e.g., parents, grandparents, and teachers). His parents were particularly concerned with his elopement behavior from home in which he often left the house and wandered down the street without their knowledge. In community settings, Brian often ran into ongoing traffic (in streets and parking lots), employee-only areas in stores, and construction areas. His parents were extremely concerned that this behavior along with his limited vision placed him at immense risk for injury.

Greg was a 4-year-old boy with diagnoses of Pervasive Developmental Disorder (Not Otherwise Specified), Developmental Language Delay, Development Delay (Not Otherwise Specified), Disturbance of Conduct, and Intellectual Disability. He was referred for an evaluation of impulsivity and aggression. Greg reportedly engaged in elopement behavior in the form of running away from his mother in community settings and running away from his teachers at school. This behavior was particularly stressful to his mother as she also had a 2-year-old son. She noted that while trying to get both boys out of the car, Greg often ran off into the parking lot oblivious to ongoing traffic. In an effort to prevent this behavior, Greg's mother tried to hold his hand or pick him up when in community settings; however, this was difficult given her responsibility for both boys.

Deborah was a 6-year-old girl with diagnoses of Down syndrome, Mild Intellectual Disability, and Attention Deficit Hyperactivity Disorder (ADHD). She was

referred for a follow-up evaluation of elopement and noncompliance after receiving treatment for elopement in a day treatment program to evaluate the effectiveness of previously recommended strategies and parental strategies. During this treatment, she was exposed to the DRA and RC protocol, and it was recommended that her parents implement DRA and RC practice sessions in addition to using a child harness to reduce elopement behavior. Her parents reported difficulty with implementing the recommendations prior to Deborah's being treated for ADHD; however, Deborah reportedly engaged in elopement behavior in which she ran away from her parents in public places. This was particularly concerning to her parents because Deborah's mother had very limited vision and could not see Deborah if she was more than a few feet away from her mother. Her parents attempted to address Deborah's elopement behavior by securing her in a stroller when out; however, Deborah had recently outgrown the stroller. Her physical growth also made it very difficult for her mother to pick her up or redirect her. Therefore, the day treatment program recommended the use of a child harness to increase Deborah's safety.

Settings and Materials

All phases of the study were conducted in pediatric outpatient specialty clinics. David, Brian, Greg, and Deborah were evaluated in the Neurobehavioral Clinic at the University of Iowa Children's Hospital. The Neurobehavioral Clinic is staffed by a pediatric psychologist and pediatric psychology graduate students. The clinic focuses on assessment and treatment recommendations of school-age children with co-occurring learning and behavioral concerns. Kendal was evaluated in the Behavioral Pediatrics Clinic (BPC) at the University of Iowa Children's Hospital. The BPC is a multidisciplinary clinic staffed by three pediatric psychologists, pediatric psychology graduate students, a pediatrician, a pediatric resident, a pediatric nurse practitioner, a speech and language pathologist, and a social worker. The BPC provides assessment and

treatment recommendations for parents and care providers with children 2 to 10 years of age who engage in problem behavior.

Treatment analyses were conducted in clinic settings similar to the situations and settings in which parents reported that their child typically eloped. Analyses were conducted in three types of settings: (a) a hallway setting, (b) a hallway-pathway setting, and (c) a waiting room setting. The hallway settings involved conducting analyses in a hallway of the outpatient clinic building near the treatment room. Brian, Greg, Kendal and Deborah's trials were all conducted in the hallway setting. The hallway was approximately 14 meters long and near the treatment room. The hallway-pathway setting involved conducting analyses in a hallway near the treatment room and outside along a pathway leading to an outdoor playground. It included a distance approximately 14 meters long in the hallway and outside to a pathway that was approximately 25 meters long from the door of the clinic building to the playground. David's trials were conducted in the hallway-pathway setting. The waiting room setting involved conducting analyses in a waiting room in the outpatient clinic building. The waiting room was approximately 7 m x 7 m, enclosed on three sides, and had an opening approximately 2.5 m wide for entering and exiting the room. The opening had a colored carpet tile on it marking the perimeter of the room. Brian's and Deborah's trials were conducted in the waiting room setting in addition to those conducted in the hallway setting. During waiting room trials, they were seated at a .5 m x .5 m child-size table when trials were being conducted.

Dependent Variables

Data were collected on the latency (length of time in seconds) to elopement or successful completion (walking to an identified object) of the trial in both the hallway-pathway and hallway trials. *Elopement* in the hallway and hallway-pathway settings was defined as a participant walking or running more than 1 meter from his or her parent(s). *A hallway-pathway trial* was defined as walking the hallway and outside along a pathway

to the playground. A *hallway trial* was defined walking the indentified length of the hallway. Each trial began when parents let go of their child's hand and began walking, and ended when the child eloped or successfully walked to the identified object. *Walking appropriately* was defined as remaining within 1 meter of parent(s) throughout the hallway and pathway trials.

In the waiting room, data were collected on the latency to elopement or the end of a trial (successfully remaining in the waiting room for 3 minutes). *Elopement* was defined as the participant crossing the colored carpet tile line on the floor at the edge of the waiting room. A *waiting room trial* was defined as remaining in the waiting room until notified by parents that it was time to go. Each trial began when the participants' parents sat down in chairs in the waiting room after providing the children with instructions. *Waiting appropriately* was defined as remaining within the waiting room without crossing the colored tile perimeter on the floor. Waiting appropriately included moving about the waiting room to various areas as long as the participant remained within the defined perimeter.

Data Collection and Inter-observer Agreement

Latency data were collected by trained clinic staff using stop watches that were started at the beginning of each trial. Interobserver agreement (IOA) was conducted simultaneously but independently by clinic therapists. IOA was assessed by clinic therapists during 97% of trials. Agreements were computed by comparing the latency to elopement or completion of a trial by each observer. The lower latency was divided by the higher latency and multiplied by 100%. Average IOA was 97% and ranged from 92% to 100% across participants. Mean agreement for David was 98% (range, 97 to 100%), mean agreement for Kendal was 95% (range, 92 to 98%), mean agreement for Brian was 98% (range, 93 to 100%), mean agreement for Greg was 97% (range, 94 to 100%), and Deborah's 98% (range, 97 to 99%).

Design

Data were collected within a brief multielement design (Cooper et al., 1992) for all participants. Brian's and Deborah's evaluations also included a multiple baseline design (across settings) as trials were conducted in both a hallway and a waiting room setting. Greg's and Deborah's evaluations included a component analysis to examine the effectiveness of the DRA/RC treatment strategy along with previously implemented parent strategies. The study consisted of four phases. First, a free operant preference assessment (Roane et al., 1998) was conducted with each participant to determine items of relative preference to be used during the treatment phase. Second, for each participant, a baseline condition was conducted to assess the latency to elopement prior to treatment. Third, a treatment phase using differential reinforcement of an alternate behavior (DRA) with a response cost (RC) was conducted. Fourth, baseline conditions were conducted again to form a brief multielement design. Participants received a 5-minute free play break prior to beginning a new trial under all conditions. During the free play break, participants had noncontingent access to preferred activities and parents' attention throughout the trial without being presented with demands.

Procedures

The procedures used during David's, Brian's, and Kendal's evaluations were all similar. Procedures for Greg's and Deborah's evaluations varied from those used with the other participants. Greg's and Deborah's evaluations included a component analysis that examined the effectiveness of the initial treatment strategy (DRA and RC) along with strategies their parents used prior to the evaluation. Procedures for the participants who received the initial DRA/RC treatment protocol are described first, followed by procedures for the participants who received the component analyses

Initial Protocol Procedures

Introductory Interview with Parents

Before starting the study, the researcher interviewed each participant's parent(s). Each interview lasted between 15 and 20 min, and information was collected on the participant's diagnostic history, elopement frequency, previous strategies attempted to decrease elopement behavior, and preferred activities and/or toys. During the interview, the researcher also collected ABC (antecedent, behavior, consequence) data and behavioral descriptions from parent(s) in order to operationalize the participants' elopement behavior.

Phase 1: Preference Assessment

A free operant preference assessment (Roane et al., 1998) was conducted to identify relatively high preferred toys prior to beginning the baseline in each evaluation. The toys/activities used in the preference assessment were chosen based on information provided by participants' parents. During the preference assessment, each participant was seated at a table and given access to four to six toys and/or activities for 10 minutes. Participants were informed by clinic staff members that they could play with any of the toys, and their parents were instructed to provide the child with attention and play opportunities while allowing the child to choose the toy(s) and/or activities. Data were collected on the amount of time the participant allocated to each toy. The two toys with the highest amount of time allocation were subsequently used in experimental trials conducted under treatment conditions (Phase 3).

Phase 2: Baseline Conditions

One to four trials were conducted under baseline conditions for each participant. All trials were conducted by the participants' parents with coaching from clinic staff. Clinic staff modeled procedures for parents by demonstrating what to say to participants and how to say it. Procedures were modeled in the treatment room prior to beginning the first trial. Participants were then walked into the hallway by their parents while holding a

parent's hand. For hallway and hallway-pathway trials, parents were coached to hold their child's hand, make eye contact, and give their child instructions at the beginning of each trial. The participant was instructed by a parent that they were going to walk to the water fountain or playground and that they needed to walk with their parent(s) for the entire walk. Parents were also told to release their child's hand immediately after finishing the instructions and to begin walking. Throughout the evaluation, clinic staff observed parent(s) to monitor procedural integrity. To maintain procedural integrity, corrective feedback, verbal feedback, and/or modeling were provided to parents in the treatment room if the instructions they provided to their child were not clear.

For waiting room trials, Brian was taken to the waiting room by his parents and clinic staff. His parents explained that the family needed to remain in the waiting room for clinic staff to return and get them. Additionally, clinic staff and Brian's parents' identified the boundaries of the waiting room area to Brian by showing him the colored carpet tile along the perimeter of the waiting room. They explained to him that crossing the tile line meant that he was no longer in the waiting room. Prior to beginning each trial, Brian was seated at a child-size table in the waiting room and his parents provided him instructions. After finishing the instructions, Brian's parents sat down in chairs approximately 1 meter from the table where Brian was seated. This signaled the beginning of a trial and the therapists began timing latency at this point. Procedures (corrective feedback, verbal feedback, and modeling) similar to those used during the hallway and hallway-pathway trials were used to maintain procedural integrity.

Under baseline conditions, participants had noncontingent access (parental attention available irrespective of the participant's toy engagement) to their parents' attention throughout the trial. For all hallway and hallway-pathway trials, participants walked into the hallway with their parents while holding a parents' hand. Parents instructed their child that they were going to go for a walk down the hallway to the water fountain or outside to the playground. Participants were instructed that they needed to

walk with their parents for the entire walk. Data were collected on the latency to elopement or successful completion of the trial. If participants eloped (i.e., walked or ran more than 1 meter away from parent(s), the trial was terminated; the participant was immediately retrieved and returned to the treatment room to play.

For Brian's waiting room trials, he was instructed by his parents that he needed to remain within the waiting room until they told him it was time to go. Brian also had noncontingent access to toys and books supplied to visitors in the waiting room. He was not restricted to the table he was seated at while receiving instructions, but was allowed to move about the waiting room. He was instructed that he could play with toys or sit with his parents while waiting, but that he must remain in the waiting room and not cross the colored tile line. Data were collected on the latency to elopement or successful completion of the trial (remaining in the waiting room for 5 minutes). If Brian eloped (i.e., crossed the colored carpet tile line on the floor at the edge of the waiting room), the trial was terminated; he was immediately retrieved and returned to the child-size table to play for 5 minutes. The number of trials varied across participants, but ranged from 1 to 4 trials for each participant. Baseline condition trials were conducted prior to treatment conditions (Phase 2) and again following treatment (Phase 4).

Phase 3: Treatment Conditions

All trials conducted under treatment conditions were conducted by participants' parents with coaching from clinic staff. Similar to baseline, participants had noncontingent access to their parents' attention throughout treatment condition trials. Under treatment conditions participants were allowed to choose one of the two relatively preferred items identified in Phase 1 to keep with them during the trial. During the hallway and hallway-pathway trials, participants were walked into the hallway by their parents while holding a parent's hand. Once in the hallway, the participant was instructed by a parent that they were going to walk to the water fountain or playground. The participants were instructed that they needed to walk with their parent(s) for the

entire walk. During the waiting room trials, Brian was seated at the child-sized table by his parents prior to beginning the trial. Brian's parents instructed him that he needed to remain within the waiting room until they told him it was time to go.

In hallway and hallway-pathway trials, participants were instructed that they would be allowed to hold one of the identified preferred items as long as they walked with their parents (DRA). Participants were also instructed that if they walked or ran away from their parents, the preferred item would be removed (RC). Similar to baseline conditions, participants' parents held their hand while providing them with instructions. Parents then released the child's hand and began walking. If participants eloped (i.e., walked or ran more than 1 meter away from parent(s), they were immediately retrieved and the preferred item was removed from the child's hand. The participant's access to the preferred item was then restricted until the next treatment condition trial began. Next, as instructed, participants' parents reminded them that they did not get to keep the preferred item because they did not walk with their parent(s). Participants were then returned to the treatment room to play.

During the trials conducted in the waiting room, Brian received instructions similar to those provided under baseline conditions. Additionally, he was instructed that he would be allowed to hold onto the relatively preferred toy as long as he did not leave the waiting room area by crossing the colored tile line (DRA). He was informed that if he did cross the tile line and leave the waiting room area, the toy would be taken from him (RC). Instructions were delivered to Brian in the same manner as previously described. If Brian eloped (i.e., crossed the colored carpet tile line on the floor at the edge of the waiting room), he was immediately retrieved and the preferred toy was removed from his hand. Brian's access to the preferred toy was then restricted until the next treatment trial began. His parents reminded him that he did not get to keep the toy because he did not remain in the waiting room. Brian was then returned to the child-size table in the waiting room to play for 5 minutes. The number of trials conducted under

treatment conditions varied across participants, but ranged from 2 to 4 trials for each participant.

Phase 4: Reversal to Baseline Conditions

Trials conducted under reversal to baseline conditions were the same as those described in the baseline conditions. The number of trials varied across participants, but ranged from 1 to 2 trials for each participant.

Component Analysis Procedures

All trials conducted for Greg's evaluation were hallway trials, and the setting was the same as the hallway trials previously described. In addition to the previously described DRA and RC treatment, Greg's evaluation also included a hand holding (HH) treatment in which his parents held his hand for the entire duration of a treatment trial. Greg's elopement behavior was compared across four treatment conditions: (a) No treatment; (b) Hand holding only; (c) DRA and RC only; and (d) Hand holding and DRA and RC. Trials conducted under the *no treatment* condition, were the same as those described above for baseline conditions. Trials conducted under the *hand holding only treatment* were similar to those described above for baseline conditions except that Greg's parents did not to release his hand. This signaled the beginning of a trial for the hand holding condition treatment trials. Trials conducted under *DRA and RC treatment* were the same as those described for the treatment phase above. Trials conducted under the *DRA and RC and hand holding treatment* were the same except that Greg's parents did not release his hand.

Deborah's evaluation included both hallway trials and waiting room trials, and the setting was the same as those previously described for both settings. In addition to the previously described DRA and RC treatment, Deborah's evaluation included a harness treatment in which she wore a commercially available child harness (which her parents brought from home) the entire duration of a treatment trial. Deborah's elopement behavior was compared across four treatment conditions with hallway trials: (a) Harness

and DRA and RC; (b) Harness only; (c) DRA and RC only; and (d) No treatment. Trials conducted under the *harness and DRA and RC treatment* were the same as treatment conditions except that Deborah wore her harness throughout the duration of the trial. Trials conducted under the *harness only treatment* were the same as baseline conditions except that Deborah wore her harness throughout the duration of the trial. Trials conducted under *DRA and RC treatment* were the same as those described for the treatment phase above. Trials conducted under the *no treatment* condition, were the same as those described above for baseline conditions.

Deborah's elopement behavior was also examined in waiting room trials across the following three treatment conditions: (a) Harness and DRA and RC; (b) DRA and RC; and (c) No treatment. Trials conducted under the *harness and DRA and RC treatment* were also similar to those described above for treatment conditions and only differed in that Deborah wore her harness throughout the duration of the trial in addition to receiving the DRA and RC treatment. Trials conducted under *DRA and RC treatment* were the same as those described for the treatment phase above. Trials conducted under the *no treatment* condition were the same as those described above for baseline conditions.

CHAPTER IV

RESULTS

This chapter describes the results for each research question. First results are presented regarding the use of the brief protocol within an outpatient clinic. Results are then presented for the effectiveness of the intervention. Results are presented on the expanded use of the protocol to address the idiosyncratic variances of participants and to further specify effective treatment strategies.

Brief Protocol Use within Outpatient Time Constraints

All phases of the protocol, including the introductory interview, brief free operant preference assessment, three to six baseline trials, three to four treatment trials, and parent feedback were completed within 90 minutes for all participants. Table 2 displays the summary of time allocated specifically to preference assessments, baseline, and treatment analyses for each participant during their evaluation. The mean total time of the evaluation used for these components of the protocol for all participants was 25.8 minutes, with a range of 15-41.5 minutes.

DRA and RC Treatment for Elopement

Individual results for participants who received the initial protocol with the DRA and RC treatment are presented in figures below in the following order: (a) Figure 1, David; (b) Figure 2, Kendal; and (c) Figure 3, Brian. In each figure, the y axis denotes the latency to elopement in seconds and the x axis denotes the trials conducted in each evaluation. Elopement attempts are depicted with open data symbols. For each participant, the latency reported during trials in which participants walked appropriately throughout the duration of the trial represents the latency to successful completion of the trial.

Figure 1 displays David's latency to elopement and elopement attempts during his treatment analysis. David attempted to elope during all trials conducted under *baseline* conditions and did not attempt to elope under any of the trials conducted under *treatment*

conditions. Under *baseline* conditions (Trials 1 & 4), David attempted to elope after 15- and 8-second latencies respectively. Under *treatment* conditions (Trials 2, 3, & 5), he did not attempt to elope in any of the trials. Thus, he attempted to elope during every *baseline* trial and walked appropriately during every *treatment* condition trial.

The results of Kendal's treatment analysis are displayed in Figure 2. Kendal attempted to elope during the first two trials conducted under *baseline* conditions (Trials 1 & 2). She attempted to elope after a latency of 37 seconds during Trial 1 and after a latency of 13 seconds during Trial 2. Kendal did not attempt to elope during any of the treatment trials (Trials 3, 4, & 5), but instead walked appropriately. Kendal did not attempt to elope during the final two trials conducted under *baseline* (Trials 6 & 7). Thus, she attempted to elope during all baseline trials prior to treatment, but no elopement occurred during or following treatment.

Component Analysis Protocol

Individual results for Greg and Deborah, who received the component analysis in addition to the initial protocol with the DRA and RC treatment, are presented in figures below in the following order: (a) Figure 4, Greg; and (b) Figure 5, Deborah. As with the previous figures, if participants did not attempt to elope during a trial, the latency depicted represents trials in which participants walked appropriately and successfully completed the trial.

Figure 4 displays the results of Greg's component analysis. In addition to elopement behavior Greg engaged in additional problem behavior (e.g. dropping to the floor and refusing to walk) throughout the evaluation. This behavior is noted on Figure 4. Greg attempted to elope during 4 of 5 trials (Trials 1, 2, 3, & 12) conducted under *baseline* conditions. During Trial 11 he dropped to the floor and refused to walk. Thus elopement of problem behavior occurred during every trial. His latency to elopement was 0, 8, 7, and 0 seconds, respectively. Greg did not attempt to elope under any of the trials conducted under the *DRA and RC* and *hand holding* conditions or the *hand holding*

only conditions; however, he did drop to the floor and refuse to get up during one trial in each condition (Trial 6 & 8, respectively). The only conditions in which Greg did not attempt to elope or engage in problem behavior were during trials conducted under *DRA and RC only* conditions.

Deborah's component analysis results are displayed in Figure 5. Deborah's results are presented in a multiple baseline across settings design with the top panel displaying data from trials conducted in the hallway setting and the bottom panel displaying data from trials conducted in the waiting room setting. Deborah did not attempt to elope during trials conducted in any of the conditions in the hallway setting. The results of Deborah's component analysis in the waiting room setting were mixed. During the trials conducted under *DRA and RC and harness* conditions (Trials 1 and 2), Deborah attempted to elope during one of the trials (Trial 1) after a 50 seconds latency and walked appropriately during the other trial (Trial 2). Deborah also eloped after a latency of 36 seconds during the trial conducted under *harness only* conditions (Trial 3). She attempted to elope in one (Trial 4) of the two trials conducted under *DRA and RC only* conditions (Trial 4 & 5) after a latency of 140 seconds and walked appropriately during the second trial (Trial 5) under these conditions. Finally, Deborah attempted to elope after a latency of 20 seconds during the trial conducted under *no treatment* conditions (Trial 7).

Table 3 displays the average latency to elopement for participants under baseline and treatment conditions. Elopement attempts for all participants were reduced to zero-levels under treatment conditions when compared to baseline conditions. Table 4 displays participants' total elopement attempts for all trials conducted for each condition and percentage of elopement attempts. Individualized treatment plans were developed for each participant based on the results of their evaluation. Table 5 displays the recommended treatment for each participant.

Participant Follow-Up

Participant follow-up was conducted with three of the participants (David, Kendal, and Greg) to partially assess maintenance and generalization. A 1-month phone follow-up occurred with David and his parents reported that he maintained near-zero rates of elopement. His parents conducted practice session in the back yard and gradually increased his exposure to larger community settings. They reported that they were now able to take David into the community without a rope around him.

A 2-month follow-up was conducted with Kendal during a consultation at her preschool program. Kendal's mother noted her elopement rates in the community continued to remain at near-zero rates. Kendal's mother reported having to re-assess preferred stimuli twice since the evaluation; however, she noted no difficulty with conducting preference assessments. Kendal's mother reported that she is able to take Kendal into the community without concern; however, Kendal still had concerns with elopement in school.

A 1-month follow-up was conducted with Greg. Greg's mother reported that he continued to engage in near-zero rates of elopement in community settings. She also noted that she had begun to gradually fade hand holding in some settings without concern. She noted that she had been able to take Greg on short outings in the community in which she used only the DRA and RC treatment.

CHAPTER V

DISCUSSION

This study examined a novel way to assess and treat elopement behavior in young children in an outpatient setting. There were three purposes for conducting this study: (a) to develop a protocol for rapidly assessing and treating elopement in young children within typical outpatient clinic time restraints by using brief methodological approaches, (b) to develop pragmatic and effective treatments that increase young children's latency to elopement and reduce their number of elopement attempts by implementing a DRA and RC treatment in which participants were reinforced with relatively preferred items identified during a brief preference assessment and received mild punishment for engagement in elopement behavior, and (c) to expand the initial protocol by examining variations in the assessment and treatment methodologies to include component analyses of additional strategies that the participants' parents were using (i.e., hand holding and a child harness) to manage elopement behavior.

Summary of Findings

Implementing the Brief Protocol

Function-based treatments have demonstrated utility in treating elopement (Lang et al., 2009). These approaches involve conducting functional analyses to identify contingencies maintaining elopement behavior and subsequently designing treatment based on the results of the functional analyses (Falcomata et al., 2010; Kodak et al., 2004; Lang et al., 2010; Perrin et al., 2008; Piazza et al., 1997; Tarbox et al., 2003). However, assessment and treatment approaches using these methods can require extensive time commitments from clinicians and families and are often difficult to accommodate in an outpatient clinic setting. The shortest assessment and treatment period of the previously cited studies was conducted over 2 days (Perrin et al., 2008) which was well beyond typical outpatient time constraints (60-120 minutes). When the outpatient clinics in this study began to encounter increased referrals for children exhibiting elopement behavior,

it became necessary to develop additional methods to assess and treat elopement that could be used in an outpatient setting.

Brief methodological approaches have continued to be developed and most are currently based on Cooper et al (1992). Cooper et al. (1992) demonstrated the methodological advantages of replicating assessment results immediately following probes of effective treatment components within a brief multielement design. This approach was much more efficient than probing and replicating all assessment conditions. Cooper et al's assessment model is particularly well suited for outpatient clinic settings because active treatment components are often identified quickly, thus permitting more time to be devoted to treatment. Additionally, their brevity fit within outpatient time constraints and minimized child and/or family fatigue (Cooper et al., 1992). Based on the results of Cooper et al., I hypothesized that a protocol combining a brief preference assessment and brief treatment analyses could be efficiently used to identify effective treatment components for elopement within typical outpatient time constraints (90 minutes).

For all participants, these procedures accounted for less than half of the total evaluation time allotted. This brevity allowed for two participants' (Brian and Deborah) elopement behavior to be assessed in two settings. It also allowed time for in vivo parent training to occur during the evaluation in which parents were coached on how to implement the treatment strategies with feedback during the evaluation. For example, parents often received feedback on the importance of clearly communicating contingencies to their child. An additional benefit of these procedures was that they allowed time for clinic staff to provide comprehensive feedback and training to parents at the end of the evaluation. For example, parents were trained how to conduct practice sessions with their child at home and in the community, how to monitor and assess the strength of reinforcers, and how to manage access to reinforcers to minimize satiation effects. Finally, the brevity of these procedures provided the opportunity to briefly assess

other problem behaviors for some of the participants who presented with additional concerns.

Use of the DRA and RC Treatment for Elopement

Previous studies have suggested that differentially reinforcing the occurrence of appropriate behavior with a preferred stimuli is a viable technique for reducing problem behavior (Poling & Ryan, 1982; Ringdahl et al., 1997; Vollmer & Iwata, 1992). An important factor in the success of these strategies is the identification of preferred stimuli. Preference for items (identified through preference assessments) has been used successfully to treat aberrant behavior in the absence of a clearly identified function for the behavior (Derby et al., 1995; Piazza et al., 1996; Ringdahl et al., 1997). Furthermore, Roane et al. (1998) demonstrated that brief preference assessments could be used to identify stimuli that functioned as reinforcers and were associated with fewer problem behaviors in less time than traditional preference assessments, which are more time consuming.

I hypothesized that combining the brief preference assessment methodology described by Roane et al. (1998) with rapid alternations of baseline and differential treatment conditions with a response cost could be effectively used to reduce elopement attempts. This trend was observed in all three participants (David, Kendal, and Brian) who received the initial protocol. The treatment strategies resulted in increased latency to elopement during treatment conditions when compared to baseline conditions. Latency under treatment condition trials was at least two times that of latency observed under initial baseline conditions. Furthermore, reduction in elopement attempts under treatment conditions was observed for all participants. In fact, none of the participants made any attempt to elope under treatment conditions.

For two participants (Kendal and Brian), results of elopement attempts under baseline conditions were mixed. Brian attempted to elope during half of the trials conducted under the initial baseline conditions in the hallway setting. Replication of the

effects observed during the initial baseline trials was not achieved with Kendal and Brian. Neither participant attempted to elope during baseline trials following treatment. Instead, both walked appropriately throughout the trials and successfully completed the walk similar to their responding under treatment conditions. Although this is a positive clinical result it was not hypothesized to occur. A possible explanation for these results is that the participants learned how to walk with their parents. Barnett and Carey (1992) suggested that differentially reinforcing alternate behaviors serves to teach new behaviors to preschool-age children. This possibility is particularly likely for Brian, given that his responding under initial baseline conditions in the second setting resulted in a decrease in elopement attempts under baseline conditions (see Figure 3). These results also demonstrate that the treatment produced maintenance effects. It is likely that maintenance occurred due to the extensive parent training on implementing the treatment strategies successfully throughout the evaluation.

Expansion of the Initial Protocol to Include

Component Analyses

The parents of two participants (Greg and Deborah) were already using specific strategies to control their children's elopement and wanted to include their strategies in the protocol due to concerns about their children's safety in the absence of these strategies. Prior to his assessment, Greg's mother primarily relied on the use of hand holding in community settings to minimize elopement behavior, and Deborah's mother relied primarily on the use of a child harness to minimize Deborah's elopement behavior. Parents of both children were reluctant to abandon previous strategies given safety concerns; however, both also acknowledged that it was often not practical to use their current strategies.

The existing protocol was expanded to include a component analysis of the initial protocol treatment strategies (DRA and RC) and existing parental strategies in order to develop individualized treatment plans. The results of Greg's component analysis

suggested that he was less likely to engage in elopement behavior during trials conducted under DRA and RC and hand-holding conditions, the hand-holding only condition, and the DRA and RC only condition when compared to no treatment. However, Greg was observed to engage in problem behavior in which he dropped to the floor and refused to get up during both conditions that included hand holding. DRA and RC was the only condition in which Greg did not engage in any of this behavior. Results of the component analysis suggested that the DRA and RC treatment might be a viable option for supplementing the parents' hand holding strategy and gradually transitioning Greg to a DRA and RC treatment only.

Deborah did not engage in elopement behavior within the hallway setting. A possible explanation for these results may be due to prior learning. Prior to her evaluation, Deborah was exposed to the DRA and RC treatment while in a day treatment clinic. Therefore, it is possible that she may have learned appropriate walking in the hallway setting. However, only one trial under each condition was conducted and so it is possible elopement may have occurred if additional trials had been conducted. In the waiting room setting, Deborah was no less likely to engage in elopement behavior under the harness only condition as she was under baseline conditions. Under conditions including the DRA and RC treatment (DRA and RC only and DRA and RC + harness conditions) Deborah initially attempted to elope and then waited appropriately during trials conducted in both conditions. A possible explanation for these results could be that specific behavioral functions existed for Deborah's engagement in elopement behavior for which the DRA and RC treatment may not be best suited.

Lang et al. (2010) demonstrated that functions of elopement behavior can vary across settings. Deborah's results suggest differences in responding across settings under the various conditions of the component analysis. The function maintaining Deborah's elopement behavior in a hallway setting may have been different from the function maintaining her elopement behavior in the waiting room. During the waiting room

evaluation Deborah's parents reported that walking with the therapist may be a relatively more preferred activity than sitting with a preferred item as she often prefers physical activities which allow access to adult attention to more solitary activities. Therefore, Deborah would more likely benefit from strategies to reduce elopement attempts which allow her to gain access to preferred activities and/or attention rather than strategies which compete with elopement behavior.

Participant Follow-Up

The follow-up that occurred with three of the participants suggested that decreases in elopement behavior achieved during the evaluation were maintained at 1 (David and Greg) and 2 (Kendal) months. It also suggested that the participants' parents were able to effectively implement practice sessions using the DRA and RC treatments both at home and in the community. Furthermore, Kendal's mother was able to successfully manage reinforcer satiation by identifying competing stimuli with informal preference assessments. All of these results suggest promising outcomes for managing elopement behavior long term.

Implications for Practice

These results extend the elopement literature by assessing and treating elopement within typical outpatient clinic time constraints. They suggest that elopement can be efficiently assessed and treated with the use of brief methodologies. Specifically, the results of the current study suggest that assessing and treating elopement within this time constraint can be accomplished through the use of a protocol including brief preference assessments and rapidly alternating treatment analyses trials. The brevity of these methodologies also allows time for the addition of component analyses to examine idiosyncratic variances and strategies for treatment that may strengthen or supplement the use of the DRA and RC treatment.

These results also extend the elopement literature by demonstrating the use of brief methodologies for assessing and treating elopement. Although the functional

analysis methodology remains the primary tool for assessing and treating elopement (Falcomata et al., 2010; Kodak et al., 2004; Lang et al., 2010; Perrin et al., 2008; Piazza et al., 1997; Tarbox et al., 2003), this study suggests that methodologies including brief preference assessments and treatment analyses may be a viable option for assessing and treating elopement. Furthermore, the results demonstrate that elopement may be effectively assessed and treated in an outpatient setting under typical outpatient time constraints. These results support the assessment and treatment of elopement in settings other than inpatient, residential, or day treatment settings.

The pragmatic features of the methodologies used throughout this study also suggest implications for their use in a variety of settings. The methodologies employed required minimal resources and time and may be appropriate for implementation in a variety of settings such as schools where time and staff resources may be limited. This study demonstrates a methodological approach that is both pragmatic and effective. The benefits of in vivo training and opportunities for parents and caregivers to immediately observe the effectiveness of the treatment during the evaluation are that they may also support increased treatment acceptability. Additionally, the strategies are practical and can be implemented by parents and/or teachers at home or at school for ongoing practice sessions and training.

Finally, the results of this study have implications for treating elopement behavior for a variety of subgroups. The clinics in which participants were evaluated provide services to a variety of children, including typically developing children and those with developmental delays, intellectual delays, medical disorders, and/or behavior disorders. The participants in this study had diverse diagnoses such as Down Syndrome, Intellectual Disabilities, Attention Deficit Hyperactivity Disorder, Pervasive Developmental Disorder (Not Otherwise Specified), Developmental Language Delay, Development Delay (Not Otherwise Specified), Disturbance of Conduct, Impulse Control

Disorder (unspecified), and Peter's Anomaly. The effectiveness of the protocol across all of these conditions highlights its versatile application.

Future Directions

In the current study, brief methodological components were found to be effective in treating elopement behavior under outpatient clinic time restraints. Specifically, it demonstrated that a brief operant preference assessment was effective for identifying stimuli used to compete with elopement behavior through differential reinforcement of alternative behaviors with a response cost. Thus elopement attempts were reduced and latency to elopement was increased with the use of the DRA and RC treatment. The effectiveness of the DRA and RC treatment was then compared to parent-identified restraint treatment strategies (hand holding and child harness) in a component analysis. An extension of this study might be to examine the use of additional and/or supplemental treatment strategies for reducing elopement behavior (e.g., differential reinforcement of other behaviors, functional communication training). For example, the results of Deborah's evaluation suggest that the initial protocol was successful in reducing elopement behavior in the hallway setting; however, it produced mixed results in the waiting room setting. Anecdotal observations suggested that Deborah might have eloped to gain access to preferred activities (e.g., walking in the hallway with the therapist). An extension might evaluate the effectiveness of implementing FCT to gain access to preferred activities.

Deborah's results also suggest another extension that may be of relevance to researchers. An extension of this work might be to incorporate latency to elopement as an independent variable in stimulus preference assessments. Derby et al, (1995) used latency to engagement in aberrant behavior as a dependent variable to help identify relative preference to an item. Using this method, clinicians would be able to identify which stimuli were the most powerful with regard to competing with elopement behavior. Additionally, this assessment may provide valuable information as to which stimuli are

most reinforcing in a specific setting and strengthen its ability to compete with elopement behavior.

Limitations

The study's use of brief methodological approaches to assess and treat elopement poses some limitations and concerns. One limitation was the limited number of participants in the study. Evaluating more participants would further establish the generality of the findings. Similarly, follow-up with participants was conducted with only three of the participants. Follow-up with all five participants would have strengthened the assessment of maintenance parents were able to achieve after their child's evaluation.

A second limitation of this study was that the reinforcers that maintained elopement behaviors were not identified. Therefore, function-based treatments could not be employed. The DRA and RC treatments that were implemented may not have been directly related to the behavior. Given that no clear function was experimentally tested or identified, the goal of the treatment was to identify stimuli that competed with those contingencies maintaining elopement behavior.

The brief free-operant methodology used to identify competing stimuli provides only a small sample of relative preference behavior that may not account for satiation effects or changes in preference over time. This approach may require increased maintenance from parents and clinicians over time to continually identify preferred stimuli. With regard to long-term treatment, parents may find it necessary to continue to conduct preference assessments in order to identify reinforcers as the child's preferences change or as they become satiated with the stimuli.

Finally, the constraints of outpatient time allotment and the protocol do not allow for extensive assessment of the elopement behavior under the various experimental conditions. For example, David's and Kendal's evaluation did not include sufficient trials under the initial baseline conditions to establish a trend. During the reversal

baseline phase, David's elopement behavior returned to baseline levels (see Figure 1). However, Kendal did not engage in elopement behavior under baseline conditions during the reversal baseline phase. Although Kendal's results are encouraging clinically, they demonstrate a loss of experimental control. Without additional time to conduct further assessment, it was difficult to account for Kendal's behavior under the reversal baseline phase conditions.

Conclusions

Three major findings were suggested by the results of this study: (a) Elopement can be effectively treated within the time constraints of outpatient clinic settings, (b) brief methodologies including brief free operant preference assessments and rapidly alternating treatment analysis trials can be used to successfully treat elopement, and (c) component analyses can be effectively used to identify responding to idiosyncratic stimuli. These results extend the elopement literature by demonstrating that elopement can be assessed and treated within typical outpatient clinic time constraints by using brief methodology approaches.

REFERENCES

- Adams, G. R., & Munro, G. (1979). Portrait of the North American runaway: A critical review. *Journal of Youth & Adolescence*, 8, 359-373.
- Barnett, D. W., & Carey, K. T. (1992). *Designing interventions for preschool learning and behavior problems*. The Jossey-Bass Social and Behavioral Science Series and The Jossey-Bass Education Series. San Francisco, CA: Jossey-Bass.
- Barnett, D. W., Elliott, N., Wolsing, L., Bunger, C. E., Haski, H., McKissick, C., & Vander Meer, C. D. (2006). Response to intervention for young children with extremely challenging behaviors: What it might look like. *School Psychology Review*, 35, 568-582.
- Bodfish, J. W. (1992). AWOL behavior. In E. A. Konarski & J. E. Favell (Eds.), *Manual for the assessment and treatment of the behavior disorders of people with mental retardation* (Tab BD17, pp. 1–8). Morganton, NC: Western Carolina Center Foundation.
- Borens, R. (1974). Why patients run away from open ward of psychiatric clinic. *Praxis der Psychotherapie*, 19, 89-98.
- Borse, N. N., Gilchrist, J., Dellinger, A. M., Rudd, R. A., Ballesteros, M. F., & Sleet, D.A., (2008). *CDC Childhood injury report: Patterns of unintentional injuries among 0 -19 year olds in the United States, 2000-2006*. Atlanta, GA: Centers for Disease Control and Prevention, National Center for Injury Prevention and Control.
- Bowman, L. (1996). Behavior modification and Down syndrome dementia: A case study of treatment in real life setting. *Developmental Disabilities Bulletin*, 42, 58–67.
- Centers for Disease Control and Prevention (CDC). (2004). Web-based Injury Statistics Query and Reporting System (WISQARS) [Online]. National Center for Injury Prevention and Control, Centers for Disease Control and Prevention (producer). Available from: URL: www.cdc.gov/ncipc/wisqars. [2011 April 2].
- Chambers, J. J., Sanok, R. L., & Striefel, S. (1980). Using contingent decreased freedom-of-movement to eliminate classroom running away: A case study. *Education and Treatment of Children*, 3,123-132.
- Cooke, G., & Thorwarth, C. (1978). Prediction of elopement of mentally ill offenders using the MMPI. *Criminal Justice and Behavior*, 5, 151-157.
- Cooper, L., Wacker, D., Thursby, D., Plagmann, L., Harding, J., Millard, T., & Derby, M. (1992). Analysis of the effects of task preferences , task demands, and adult attention on child behavior in outpatient and classroom settings. *Journal of Applied Behavior Analysis*, 25, 823-840.
- Damashek, A. L., Williams, N. A., Sher, K. J., Peterson, L., Leis, T., & Schweinle, W., (2005). Risk for minor childhood injury: An investigation of maternal and child factors. *Journal of Pediatric Psychology*, 30, 469-480.

- Danescu, E. R., Miller T. R., & Spicer, R. S. (2000). Incidence and costs of 1987-1994 childhood injuries: Demographic breakdowns. *Pediatrics*, *105*(2), E27.
- Derby, K. M., Wacker, D. P., Andelman, M., Berg, W., Drew, J., Prouty, A., & Laffey, P. (1995). Two measures of preference during forced-choice assessments. *Journal of Applied Behavior Analysis*, *28*, 345–346.
- Falcomata, T. S., Roane, H. S., Feeney, B. J. & Stephenson, K. M. (2010). Assessment and treatment of elopement maintained by access to stereotypy. *Journal of Applied Behavior Analysis*, *43*, 513-517.
- Garner, M. (1990). The treatment of elopement behavior in a retardate using a graduated levels program. *Journal of Behavior Therapy and Experimental Psychiatry*, *21*, 277–280.
- Gibson, J. L., Pennington, R. C., Stenhoff, D. M., & Hopper, J. S. (2010). Using desktop videoconferencing to deliver interventions to a preschool student with autism. *Topics in Early Childhood Special Education*, *29*, 214-225.
- Hargett, M. Q., & Webster, R. E. (1996). Treatment integrity and acceptability with families: A case study of a child with school refusal. *Psychology in the Schools*, *33*, 319–324.
- Interactive Autism Network (IAN). (2011). *IAN research report: Elopement and wandering*. Interactive Autism Network: Kennedy Krieger Institute (producer). Available from: www.iancommunity.org/cs/ian_research_reports/ian_research_report_elopement#?viewType=print. [2011 April 2].
- Iwata, B. A., Dorsey, M. F., Slifer, K. J., Bauman, K. E., & Richman, G. S. (1994). Toward a functional analysis of self-injury. *Journal of Applied Behavior Analysis*, *27*, 197–209. (Reprinted from *Analysis and Intervention in Developmental Disabilities*, *2*, 3–20, 1982)
- Jacobson, J. W. (1982). Problem behavior and psychiatric impairment within a developmentally disabled population I: Behavior frequency. *Applied Research in Mental Retardation*, *3*, 121–139.
- Johnson, R., & Carter, M. (1980). Flight of the young: Why children run away from their homes. *Adolescence*, *15*, 483-489.
- Karazsia, B. T., & van Dulmen, M. H. (2010). Assessing injuries with proxies: Implications for understanding concurrent relations and behavioral antecedents of pediatric injuries. *Journal of Pediatric Psychology*, *35*, 51-60.
- Kodak, T., Grow, L., & Northup, J. (2004). Functional analysis and treatment of elopement for a child with attention deficit hyperactivity disorder. *Journal of Applied Behavior Analysis*, *37*, 229–232.
- Lang, R., Davis, T., O'Reilly, M., Machalicek, W., Rispoli, M., Sigafos, J.,...Register, A. (2010). Functional analysis and treatment of elopement across two school settings. *Journal of Applied Behavior Analysis*, *43*, 113-118.

- Lang, R., Rispoli, M., Machalicek W., White, P., Kang, S., Pierce, N.,...Lancioni, P. (2009). Treatment of elopement in individuals with developmental disabilities: A systematic review. *Research in Developmental Disabilities, 30*, 670–681.
- Leaf, J. B., Dotson, W. H., Oppenheim, M. L., Sheldon, J. B., & Sherman, J. A. (2010). The effectiveness of a group teaching interaction procedure for teaching social skills to young children with pervasive developmental disorder. *Research in Autism Spectrum Disorder, 4*, 186-198.
- Lerman, D. C., Vorndran, C., Addison, L., & Kuhn, S. A. (2004). A rapid assessment of skill in young children with autism. *Journal of Applied Behavior Analysis, 37*, 11-26.
- Lowe, K., Allen, D., Jones, E., Brophy, S., Moore, K., & James, W. (2007). Challenging behaviours: Prevalence and topographies. *Journal of Intellectual Disability Research, 51*, 625–636.
- Morrongiello B. A., & Matheis, S. (2004). Determinants of children's risk-taking in different social-situational contexts: The role of cognitions and emotions in predicting children's decisions. *Journal of Applied Developmental Psychology, 25*, 303–26.
- Northup, J., Wacker, D., Sasso, G., Steege, M., Cigrand, K., Cook, J., & DeRaad, A. (1991). A brief functional analysis of aggressive and alternative behavior in an outclinic setting. *Journal of Applied Behavior Analysis, 24*, 509–522.
- Olmi, J. D., Sevier, R. C., & Nastasi, D. F. (1997). Time-in/time-out as a response to noncompliance and inappropriate behavior with children with developmental disabilities: Two case studies. *Psychology in the Schools, 34*, 31–39.
- Olsen, L., Brussoni, M., Miller, A., & O'Donnell, M. (2010). Managing injury risk for children with disabilities and chronic health conditions: Parent perspectives. *Injury Prevention, 16*, 2010.
- Perrin, C. J., Perrin, S. H., Hill, E. A., & DiNovi, K. (2008). Brief functional analysis and treatment of elopement in preschoolers with autism. *Behavioral Interventions, 23*, 87–95.
- Piazza, C. C., Fisher, W. W., Hanley, G. P., Hilker, K., & Derby, K. M. (1996). A preliminary procedure for predicting the positive and negative effects of reinforcement-based procedures. *Journal of Applied Behavior Analysis, 29*, 137–152.
- Piazza, C. C., Hanley, G. P., Bowman, L. G., Ruyter, J. M., Lindauer, S. E., & Saiontz, D. M. (1997). Functional analysis and treatment of elopement. *Journal of Applied Behavior Analysis, 30*, 653–672.
- Poling, A., & Ryan, C. (1982). Differential reinforcement of other behavior schedules: Therapeutic applications. *Behavior Modification, 6*, 3–21.
- Rapp, J., Vollmer, T., & Hovanetz, A. N. (2005). Evaluation and treatment of swimming pool avoidance exhibited by an adolescent girl with autism. *Behavior Therapy, 36*, 101–105.

- Ringdahl, J. E., Vollmer, T. R., Marcus, B. A., & Roane, H. S. (1997). An analogue evaluation of environmental enrichment: The role of stimulus preference. *Journal of Applied Behavior Analysis, 30*, 203-216.
- Roane, H. S., Vollmer, T. R., Ringdahl, J. E., & Marcus, B. A. (1998). Evaluation of a brief stimulus preference assessment. *Journal of Applied Behavior Analysis, 31*, 605-620.
- Schwebel, D. C., & Bounds, M. L. (2003). The role of parents and temperament on children's estimation of physical ability: Links to unintentional injury prevention. *Journal of Pediatric Psychology, 28*, 505-516.
- Sleet, D. A., Schieber, R. A., & Dellinger, A. Childhood injuries. In L. Breslow (Ed.), *The Encyclopedia of Public Health, Vol. I* (pp. 184-187). New York, NY: Macmillan
- Tarbox, R. S., Wallace, M. D., & Williams, L. (2003). Assessment and treatment of elopement: A replication and extension. *Journal of Applied Behavior Analysis, 36*, 239-244.
- Thorne, F. C. (1947). The problem of institutional elopements. *American Journal of Mental Deficiency, 4*, 637-643.
- Vollmer, T. R., & Iwata, B.A. (1992). Differential reinforcement as treatment for behavior disorders: Procedural and functional variations. *Research in Developmental Disabilities, 13*, 393-417.

APPENDIX A

TABLES

Table A1
Summary of Studies on Assessment and Treatment of Elopement

Study	# of Participants	Service Delivery Model	Methods	Length of Assessment & Treatment
Thorne (1947) <i>American Journal of Mental Deficiency</i>	25	residential facility	Non-experimental Methods	> 1 week
Chambers et al. (1980) <i>Education & Treatment of Children</i>	1	University treatment center classroom	Non-experimental Methods	27 weeks
Garner (1990) <i>Journal of Behavior Therapy and Experimental Psychiatry</i>	1	residential group home	Non-experimental Methods	> 7 months
Hargett et al. (1996) <i>Psychology in the Schools</i>	1	school/education setting	Non-experimental Methods	> 7 months
Bowman (1996) <i>Developmental Disabilities Bulletin</i>	1	residential facility	Non-experimental Methods	3 months
Olmi et al. (1997) <i>Psychology in the Schools</i>	2 participants, 1 engaging in elopement behavior	school/education setting	Non-experimental Methods	1 weeks
Piazza et al. (1997) <i>Journal of Applied Behavior Analysis</i>	3	Inpatient Unit	Experimental Methods	Ranged from 9-12.5 hours across participants

Table 1 (continued)

Study	# of Participants	Service Delivery Model	Methods	Length of Assessment & Treatment
Tarbox et al. (2003) <i>Journal of Applied Behavior Analysis</i>	3	Outpatient Day Treatment	Experimental Methods	Session length not reported. Range of 26-42 sessions conducted across participants
Kodak (2004) <i>Journal of Applied Behavior Analysis</i>	1	Summer Day Program	Experimental Methods	3.5 hours
Rapp et al. (2005) <i>Behavior Therapy</i>	1	Outpatient	Experimental Methods	1 session/week for 8 weeks
Barnett et al. (2006) <i>School Psychology Review</i>	1	School/Education Setting	Non-experimental Methods	5 months
Perrin et al. (2008) <i>Behavioral Interventions</i>	2	Outpatient	Experimental Methods	2 session blocks across 2 days
Falcomata et al. (2010) <i>Journal of Applied Behavior Analysis</i>	1	Outpatient Day Treatment	Experimental Methods	>8 hours
Gibson et al. (2010) <i>Topics in Early Childhood Special Education</i>	1	School/Education Setting	Experimental Methods	> 12 days

Table 1 (continued)

Study	# of Participants	Service Delivery Model	Methods	Length of Assessment & Treatment
Lang et al. (2010) <i>Journal of Applied Behavior Analysis</i>	1	School/Educational Setting	Experimental Methods	1 hour, 40 minutes

Table A2
Summary of Session Time Allocated to Assessment and Treatment for Participants

Participant	Preference Assessment	Baseline & Treatment Analysis Trials		Total Time Assessment & Treatment
	# of Minutes	# of Trials	# of Minutes	# of Minutes
David	5	5	5	15
Kendal	5	7	7.5	19.5
Brian	5	17	19.5	41.5
Greg	5	12	5.5	22.5
Deborah	5	11	14.5	30.5

Table A3
Average Latency to Elopement Under Baseline and Treatment
Conditions

Participant	Average Latency to Elopement in Seconds	
	Baseline Conditions	Treatment Conditions
David	11.5	92.6
Kendal	50.25	77.9
Brian (Waiting room)	37.75	212.6
Brian (Hallway)	30	45.5

Table A4
Elopement Attempts Under Baseline and Treatment Conditions

Participant	Baseline Conditions		Treatment Conditions	
	Elopement Attempts (Out of All Trials)	%	Elopement Attempts (Out of All Trials)	%
David	2/2	100	0/3	0
Kendal	2/4	50	0/3	0
Brian (Waiting room)	4/4	100	0/3	0
Brian (Hallway)	2/6	33	0/4	0

Table A5
Recommended Treatments for Participants

Participant	Recommended Treatment
David	Differential Reinforcement of Alternative Behavior with a Response Cost
Kendal	Differential Reinforcement of Alternative Behavior with a Response Cost
Brian	Differential Reinforcement of Alternative Behavior with a Response Cost
Greg	Differential Reinforcement of Alternative Behavior with a Response Cost
Deborah	Hand holding*
	Differential Reinforcement of Alternative Behavior with a Response Cost
	Functional Communication Training Harness*

* Both Greg's and Deborah's treatment plan included recommendations to gradually fade previously used strategies (e.g., Hand holding and Harness use).

APPENDIX B

FIGURES

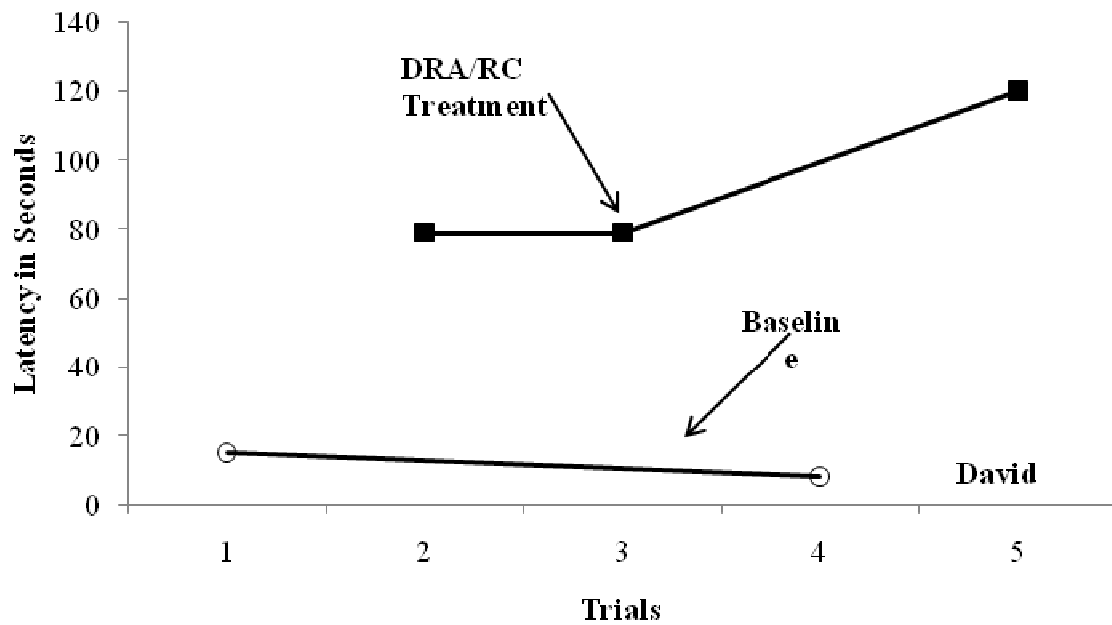


Figure B1. Treatment results for David across trials

DRA/RC = Differential Reinforcement of an Alternative Behavior plus a Response Cost. Open symbols during both the DRA/RC and Baseline conditions show that elopement was attempted.

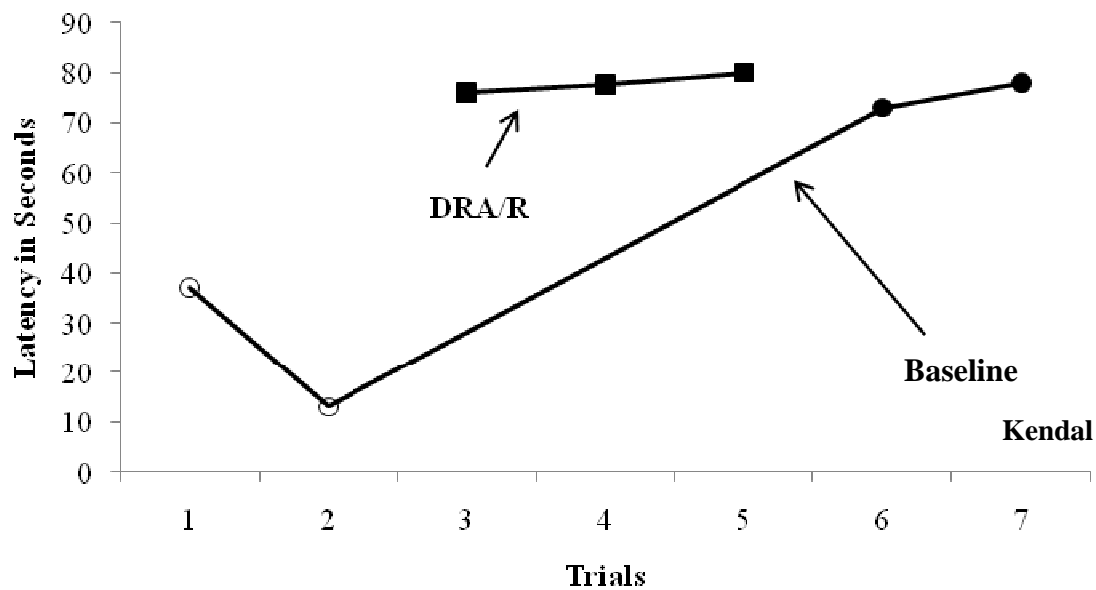


Figure B2. Treatment results for Kendal across trials

DRA/RC = Differential Reinforcement of an Alternative Behavior plus a Response Cost. Open symbols during both the DRA/RC and Baseline conditions show that elopement was attempted.

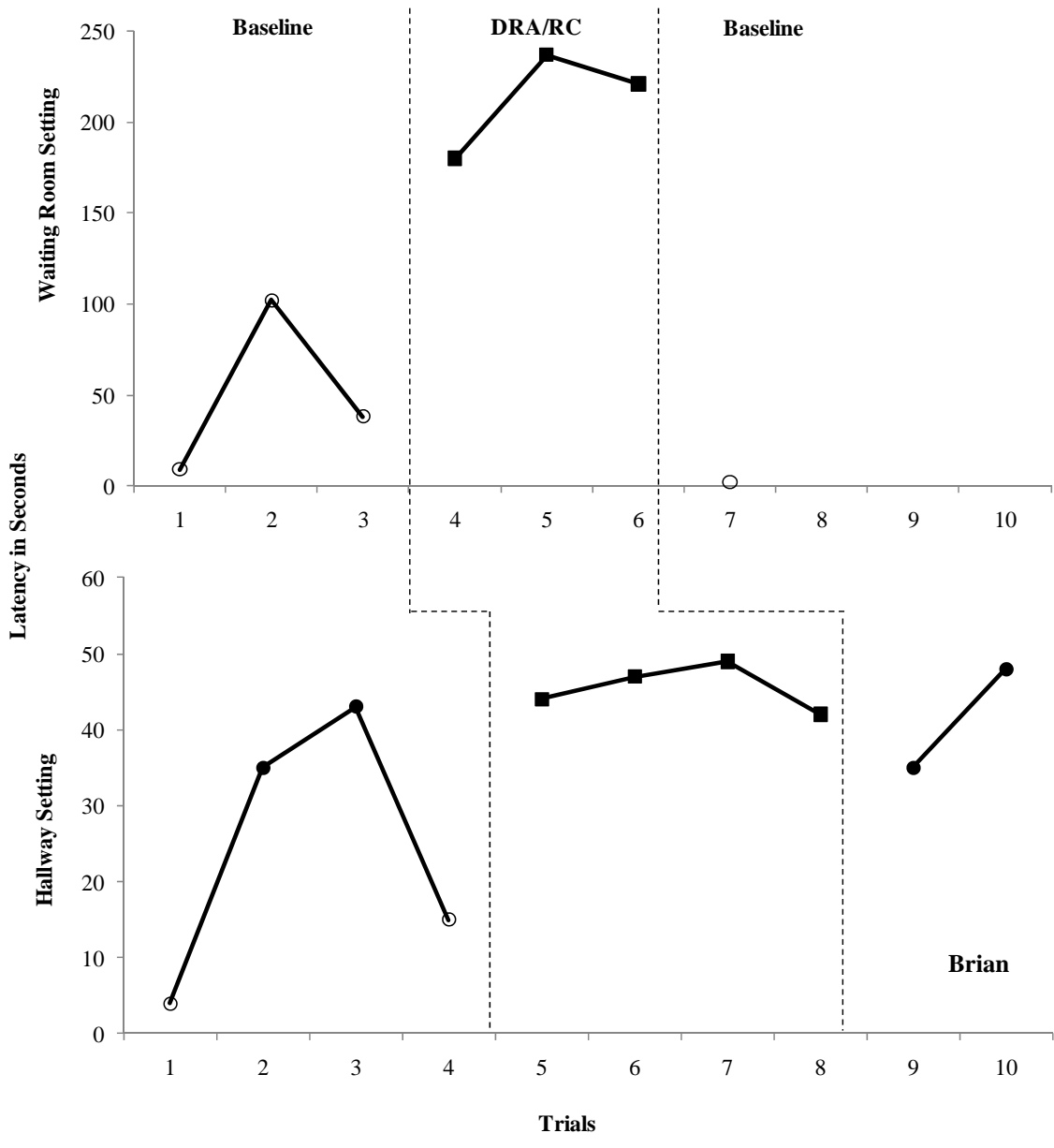


Figure B3. Treatment results for Brian across trials

DRA/RC = Differential Reinforcement of an Alternative Behavior plus a Response Cost. Open symbols during both the DRA/RC and Baseline conditions show that elopement was attempted.

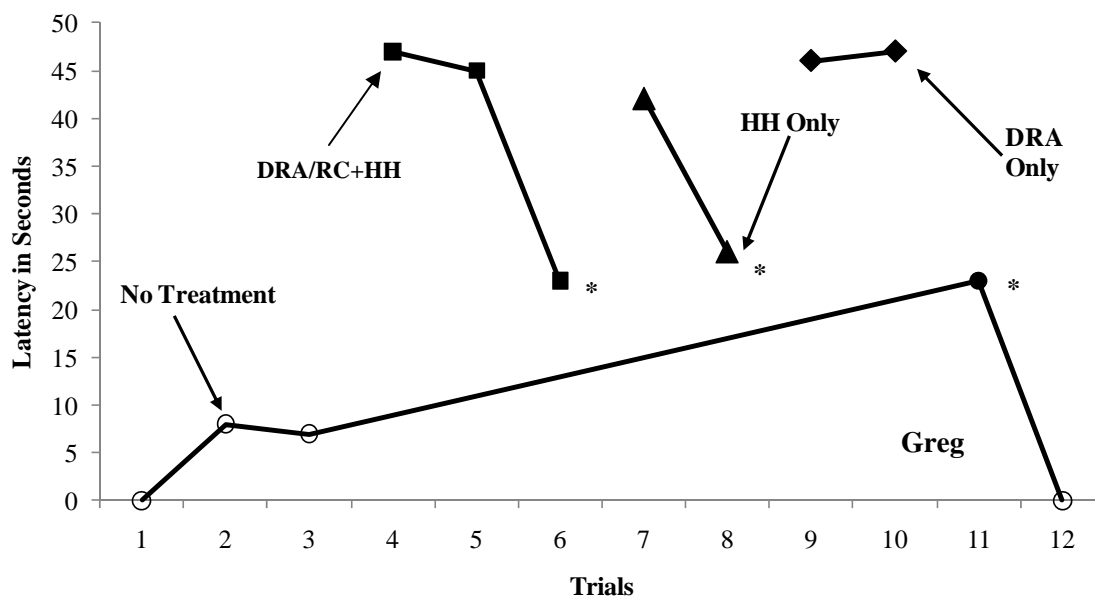


Figure B4. Treatment results for Greg across trials

DRA/RC + HH = Differential Reinforcement of an Alternative Behavior plus a Response Cost and Hand Holding; HH = Hand Holding only; DRA/RC = Differential Reinforcement of an Alternative Behavior plus a Response cost only; * = Dropped to the floor. Open symbols during all conditions show that elopement was attempted.

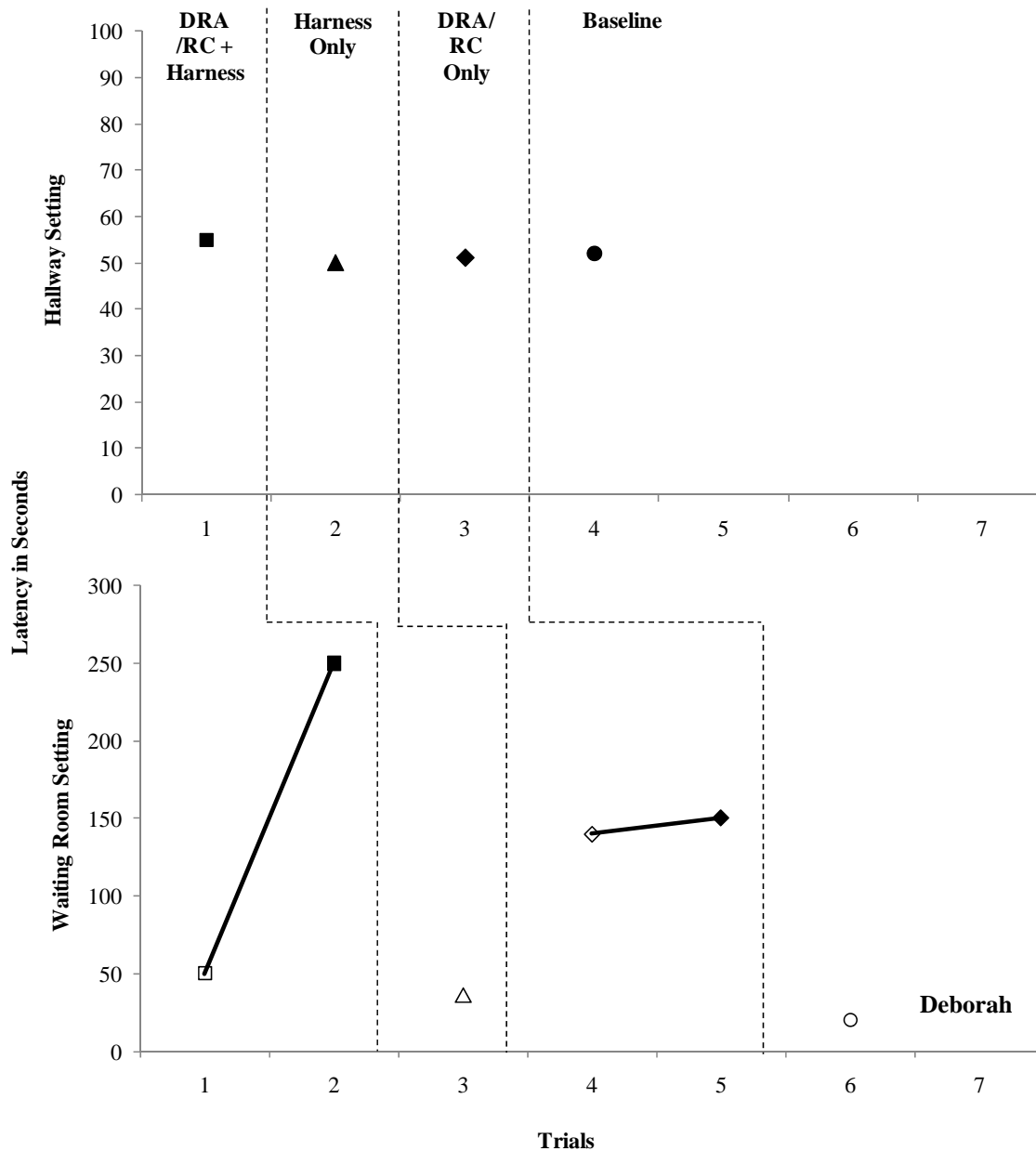


Figure B5. Treatment results for Deborah across trials

DRA/RC+ Harness = DRA/RC = Differential Reinforcement of an Alternative Behavior plus a Response cost and wearing a harness; Harness = wearing a harness only; DRA/RC = Differential Reinforcement of an Alternative Behavior plus a Response Cost only. Open symbols in all conditions show that elopement was attempted.