

2011

Making a Splash: Eliminating Water Phobia and Increasing Confident Water Skills

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Making a Splash: Eliminating Water Phobia and Increasing Confident
Water Skills

by

Paula E. Chan

A thesis submitted in partial fulfillment
of the requirements for the degree of
Master of Arts
Department of Child and Family Studies
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Date Approved:
June 17, 2011

Keywords: Anxiety, swimming, self-monitoring, goal setting, behavioral skills training.

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I dedicate this manuscript to my parents, Linn and Gus. I am eternally grateful for their sacrifice and commitment to our family. They instilled in me a work ethic and drive necessary to complete this thesis. Without their continuous support, encouragement, wisdom and guidance, I would not be where I am today.

Acknowledgements

First and foremost, I would like to acknowledge with the most sincere gratitude, my advisor, Kimberly Crosland. I am incredibly grateful to her for her brilliance, patience, and commitment to mentoring throughout my time in graduate school. I would also like to thank Victoria Fogel for her meticulous efforts in shaping my research repertoire. These women were instrumental in the completion of this project.

I am indebted to my research assistant Viviana Gonzales, for all her time and efforts with my project. Her dedication led to the timely completion of my data analysis. Furthermore, I would like to thank Rose Iovannone and Shelley Clarke, who both willingly shared their time and ideas as committee members.

Finally, I would like to thank Peter Bendix and Meredith Osborne for their unwavering support and encouragement throughout my graduate school experience. Whether counseling me about the latest “crisis” or reinforcing my research efforts with nice dinners out, I am eternally grateful for their love and support.

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Abstract

The purpose of this study was to utilize a multi-component intervention to increase confident water skills for three typically developing children, and to evaluate whether fearful behaviors decreased as the intervention progressed. The intervention, comprised of goal setting, self-monitoring, behavioral skills training and positive reinforcement, was used in community pools to teach basic water skills. Results suggest the intervention was successful in increasing confident water skills, while intervals with positive affect and fearful behaviors demonstrated variability.

Chapter One: Introduction

Anxiety disorders have been receiving more attention in the past decade from both clinicians and researchers. In 2000, the American Psychological Association listed 12 distinct anxiety diagnoses in the Diagnostic and Statistical Manual (DSM) IV-TR. In 2008, the National Institute on Mental Health estimated that 8.7 percent of the population suffers from a specific phobia. To address these populations, numerous treatment approaches have developed from clinical psychology, ranging from Freudian psychoanalysis to existentialism, to applied behavior analysis (Friman, Hayes, & Wilson, 1998).

Applied behavior analysis (ABA) has a rich tradition in providing successful interventions for individuals with developmental disabilities. However, there are fewer applications of ABA applied to addressing psychiatric disorders (Harvey, Luiselli, & Wong, 2009). Woods, Miltenberger, and Carr (2006) noted that this might be attributed to the fact that applied behavior analysis has evolved out of experimental laboratories, rather than clinical psychology. Another potential reason for the limited literature in this area is, perhaps, due to the field of ABA's primary measurement of overt behaviors (i.e. behavior that is observable by others) rather than covert behaviors, such as thoughts, emotions, and perceptions (Woods et al. 2006).

However, phobic covert behaviors might be altered through a behavior analytic perspective by addressing overt responses which are measurable. Phobic covert behaviors

may make phobic overt behaviors more likely to occur in order to escape or avoid a situation which involves the fearful stimulus. For example, a child who is afraid of dogs might experience covert responses such as an elevated heart rate, sweaty palms, and/or thoughts about the dog, which in turn might make the overt response of running away, when in the presence of a dog, more likely. That is, in the presence of the dog, running away results in the removal of the aversive stimulus (i.e. dog and covert responses); thereby, increasing the future likelihood that the child will run away when in the presence of a dog. This would be considered an example of escape which is a form of negative reinforcement. Escape is characterized by the termination of an aversive stimulus present in the environment, which increases the future likelihood of the behavior (Domjan, 2006). In this example, instead of addressing the covert behavior directly (i.e. anxiety, elevated heart rate, etc.) the behavior analytic approach might only assess the overt behavior of running away as this behavior can be directly observed and measured. In another example, a particularly fearful child may experience similar covert behavior (i.e. elevated heart rate, sweaty palms, etc.), but in lieu of running away, a child might engage in overt responses such as choosing to go somewhere else or staying in the same environment instead of going to parks, field trips, play dates, or in any other place where there is the possibility of seeing a dog. That is, when presented with an opportunity to go to a park, play date, etc., coupled with the mention of a dog or the thought of a past experience with a dog in that specific or similar environment, choosing to go somewhere else or to stay in the same place results in avoiding the aversive stimulus (i.e. dog). Thereby, increasing the future likelihood that the child will choose to go somewhere else or stay in the same place when presented with a similar scenario. The behavior analytic

approach might assess the overt behaviors of choosing to go somewhere else or staying in the environment when the child is told a dog may be present in another environment as these behaviors can be directly observed and measured. This would be an example of avoidance, which is another type of negative reinforcement. Avoidance is characterized by exhibiting behavior that prevents or delays the presentation of an aversive stimulus, and as a result, the future likelihood of the behavior is increased (Mazur, 1998).

Theorists hypothesize that avoidance responding is a result of a combination of respondent conditioning, which involves an increase in physiological arousal in the presence of the conditioned stimulus (e.g. the sound of a dog barking or the sound of dog tags), and operant conditioning, which involves the discriminative stimulus (e.g. sounds associated with the dog) evoking an overt behavior (e.g. crying, running away, verbal behavior indicating fear or the need for escape), which would be negatively reinforced through escaping the physiological arousal (conditioned emotional response). This hypothesis became known as two-factor theory (Mazur, 1998), and became the dominant theoretical approach to avoidance learning (Dymond & Roche, 2009). As basic research on two-factor theory developed, applied clinicians and researchers began to explore various approaches for behavior interventions.

Systematic Desensitization

Systematic desensitization was developed in the 1950s by Joseph Wolpe, and has been a popular approach for treating phobias for decades. Systematic desensitization comprised of three parts. The first aspect of systematic desensitization is to teach an individual to engage in progressive muscle relaxation, where the individual is taught to tense and gradually relax different muscle groups. Progressive muscle relaxation is taught

first because it prepares the client with the skills required to be successful at later steps of therapy (Yates, 1975). Wolpe (1973) hypothesized this prepares the client for the intervention by providing alternative behaviors to aid in relaxation while the client is exposed to fear evoking stimuli, thus lessening the autonomic responses the client experiences when exposed to a fear-evoking stimulus. Research has reported that the number of sessions required for relaxation training varies between six and fifty, and it is unclear how many sessions are needed, as it may depend on individual factors (Wolpe, 1973).

Following relaxation training, the client begins to construct one or more hierarchies of stimuli that cause fear or anxiety as part of the systematic desensitization intervention, utilizing relaxation techniques throughout this phase (Yates, 1975; Wolpe, 1973). In the final step, the individual is guided to imagine scenes where they encounter anxiety-provoking stimuli by the therapist, and instructed to engage in the progressive relaxation techniques that were taught earlier in therapy (Wolpe, 1973). Wolpe suggested that exposing the individual to each step of the established hierarchy, combined with the relaxation techniques should be able to reduce anxiety almost entirely. He elaborated that this was because the relaxation techniques held stimulus control over even the most highly feared stimuli (Wolpe, 1973).

Wolpe was very specific in his description of each step of these procedures, and deviation was considered highly undesirable (Wolpe, 1958). Additionally, he suggested that each step of the hierarchy be approached very cautiously, and that anxiety should be completely reduced before moving to the next step (Wolpe, 1958). Research has since demonstrated that systematic desensitization can be effective without relaxation training,

as well as without the use of a hierarchy (Waters, McDonald, & Koresko, 1972).

Additionally, research has found that implosion therapy (i.e. flooding), which asks the client to enter the most feared scenario, has been successful in reducing client's anxiety (Boulougouris, & Marks, 1969). Therefore, moving cautiously may not be required for decreasing phobias.

In Vivo Exposure

In the area of phobias, behavior analytic literature has taken a number of different approaches to designing intervention. Behavior analytic journals tend to report in-vivo exposure and contingent reinforcement (Efranian & Miltenberger, 1990; Jones, & Friman, 1999; Rapp, Vollmer, & Hovanetz, 2005; Ricciardi, Luiselli, & Camare, 2006; Shabani, & Fisher, 2006; Waranch, Iwata, Wohl, & Nidiffer, 1989), some have used an established anxiety hierarchy prior to intervention (Efranian, & Miltenberger, 1990; Ricciardi et al., 2006; Shabani, & Fisher, 2006) while others have not (Rapp et al., 2005). Prompting and modeling are other interventions that have been used. Prompting interventions have focused on getting the individual to move closer to the feared stimulus (Efranian, & Miltenberger, 1990), while modeling interventions involve having the individual observe a demonstration of an individual moving closer to the feared stimulus (Menzies, & Clarke, 1993)

Distraction is yet another approach used to decrease phobic responses. This typically involves engaging the individual in another activity (e.g. playing cards) to distract the individual from the feared stimulus (Efranian, & Miltenberger, 1990).

Extinction or blocking of escape and avoidance attempts has also been used to decrease phobic responding (Rapp et al., 2005).

Phobias addressed. In addition to the wide number of interventions the behavior analytic literature discusses, there are also a wide range of phobia related behaviors targeted. Insects (Jones, & Friman, 1999), mannequins (Waranch et al., 1989), dogs (Efranian, & Miltenberger, 1990), needles (Shabani, & Fisher, 2006) and water (Love, Matson, & West, 1990; Menzies, & Clarke, 1993; Pomerantz, Peterson, Marholin, & Stern, 1977; Rapp et al., 2005) represent a few of the phobias addressed in the literature.

Water phobia. Several studies have been published that address the fear of water. Literature that targets water typically has two approaches; fear of water in the context of showers and bathing (Love et al. 1990; Pomerantz et al. 1977), and fear of swimming and swimming pools (Menzies, & Clarke, 1993; Rapp et al. 2005). Despite the low number of published studies, Miller, Barrett and Hampe (1974) reported the prevalence of the fear of water was higher than the fear of spiders, insects, dogs, high places, enclosed spaces, and 73 other phobias. The only fears reported more frequently than water was the fear of snakes and rats.

Dangers associated with water. There are many dangers associated with water and the inability to swim, with one of the most obvious dangers being accidental drowning. A survey conducted in 2006 found that there are over 1,000,000 residential pools in Florida (Florida Department of Health, 2006). Florida had the third highest number of deaths from drowning in the country between 1999 and 2003. Drowning is the leading cause of death in children ages 0-4 and 71% of these deaths were in pools. Finally, in 2006, six children ages 0-4 drowned in Pinellas County. This was closely followed by Hillsborough County with four drowning deaths, and Pasco County with three drowning deaths for children ages 0-4. (Florida Department of Health).

These statistics did not decipher the exact causes of drowning (e.g. fatigue while swimming, slipping and falling into the pool while unsupervised), so they should be interpreted with caution. Some individuals might argue that children who engage in escape and avoidant behaviors in the presence of a pool would be less likely to have the opportunity to drown, due to the fact that they would avoid pools altogether. However, individuals often put themselves at risk of drowning without recognizing the potential dangers. Parents often use floatation devices for non-swimmers, which can provide a false sense of security for children in the water. If the floatation device capsizes or is popped, the child may find himself in water above his head, without the skills required to move himself back to safety. Boat rides without floatation devices may be another danger, as an individual can be thrown from the boat if sudden movements are made. Even cautiously wading into an open body of water (e.g. rivers, lakes) without an awareness of the depth of the water or the strengths of the currents can lead to drowning.

With the high level of deaths associated with drowning, researchers need to turn their attention towards developing procedures to decrease drowning related deaths. One logical approach is to teach individuals how to swim. However, many learn-to-swim programs are not equipped with the therapeutic skills necessary to teach fearful children (i.e., those who display high frequency/intensity avoidance behaviors) how to become more comfortable in the water. In order to prepare these children to swim, children need to develop the precursory behaviors necessary to learn to swim. While precursory behaviors may differ slightly from child to child, these should involve entering the water, holding onto the wall of the pool independently, having a relaxed posture (e.g. arms and

legs extended horizontally) when held by an instructor, and placing their chin or face in the water.

Pool Avoidance. Behaviors associated with pool avoidance are an area that has not received much attention in the behavior analytic literature. However, behavior analytic interventions can be used to address pool avoidance in a therapeutic manner. Two articles were found that evaluated treatment for swimming pool avoidance. Menzies and Clarke (1993) used a number of rating scales as the dependent variable to assess decreases in fear between in vivo exposure, where the child engaged in preferred activities on the pool deck, but not in the pool; vicarious exposure, where the participant saw a model engage in fearless behaviors in the water, then left the pool area to play a game; and in vivo plus vicarious exposure, where the participant saw a live model engage in fearless behaviors in the water, then engaged in a preferred activity in the pool area. They found vicarious exposure paired with in-vivo exposure was not a significantly better treatment than in-vivo exposure alone. They hypothesized that vicarious exposure may be helpful in reducing lower levels of anxiety, but it may not be useful in reducing higher levels of anxiety or fear.

While this article adds to the literature, the study could have been greatly improved by the use of more direct assessment measures for the dependent variables. Additionally, little information was provided about the interventions used with participants while in the water. Without this information, it is difficult to see the components of the intervention that were successful. Finally, authors used a group design, which provides excellent information for comparing these three treatments,

however, it does not allow much for interpretation of each individual participant's progress.

Rapp et al. (2005) conducted a study with an adolescent girl diagnosed with autism to address pool avoidance. The subject had previously enjoyed swimming, but had swallowed a large amount of water several years prior and became visibly distressed. Subsequent prompts to get her to swim resulted in escape maintained behaviors, including elopement, face hitting, flopping, choking and screaming. The authors used a multi-component intervention that included the use of extinction (by blocking escape attempts) and reinforcement for approach behaviors (e.g. provided examples of approach behaviors). Their intervention was successful in eliminating pool avoidance. This study provided a strong example of a behavior analytic approach to the treatment of pool avoidance. The use of extinction and reinforcement was shown to be successful in the treatment of pool avoidance in this study; however, it was conducted with a young lady who had previously enjoyed swimming. It is difficult to determine whether these results would have been as successful with an individual who did not have a history of reinforcement with pools. Additionally, the use of extinction for anxiety-related issues could have counter-therapeutic effects. Extinction occurs when a behavior that was previously reinforced is no longer followed by the reinforcer, and as a result, the behavior decreases in the future (Lerman, & Iwata, 1995). Often times, extinction is immediately followed by an extinction burst, which is characterized by increases in frequency, intensity or duration of behaviors, novel behaviors, and increases in emotional responding (Lerman, & Iwata, 1995). When considering the delicate nature of phobias, it is important to recognize that phobias are typically characterized by avoidance. Providing

treatment which focuses on extinction may lead to increased emotional responding during the extinction burst (e.g. crying, screaming, increased levels of fear, etc.), which could lead to increased rates of client drop out.

Another issue is whether or not function has been appropriately addressed. Despite the numerous publications on phobias in the behavior analytic literature, no authors have discussed conducting an assessment to identify the function of the phobic responses. There seems to be a general assumption that behaviors that appear to occur to escape and/or avoid fearful scenarios are indeed maintained by negative reinforcement. However, it is possible that other reinforcers, such as parent attention, maintain children's phobic behaviors. It is important to identify the function maintaining the behavior, because it may have significant implications for treatment. For example, if a child's behavior is maintained by attention, the treatment approach should primarily involve removal of attention for the phobic behaviors, whereas a child whose behaviors are primarily maintained by escape would focus on prompting the child to remain in the presence of the feared stimulus. If the reinforcer maintaining the child's behavior was identified incorrectly, intervention could reinforce the phobic behaviors, rather than place them on extinction. This may be an essential component to address before moving forward into intervention.

Positive Reinforcement. Positive reinforcement has been used in the literature to increase approach skills in the presence of feared stimuli (Rapp et al. 2005). Although this is not a functional reinforcer, introducing positive reinforcement in phobia work may introduce a competing establish operation, which may cause participants to be more

likely to engage in behaviors that contact positive reinforcement, rather than the behaviors that contact negative reinforcement in the form of escape from the pool.

Behavioral Skills Training (BST). Although BST has not been used in the phobia literature, it may aid in structuring sessions during work with phobias. BST is a teaching technique that is comprised of instruction, model demonstration, rehearsal and behavior specific feedback (Miltenberger, 2008). BST has been employed to improve the acquisition of a variety of behaviors and skills including teaching abduction prevention skills (Johnson et al., 2006), teaching gun-safety skills (Gross, Miltenberger, Knudson, Bosch, Breitwieser, 2007), HIV-prevention interventions (Albarracín et al., 2005), teaching correct instrument-playing posture (Dib, & Sturmeay, 2007), and teaching fire emergency skills (Jones, Kazdin, & Haney, 1981).

Goal Setting. Goal setting may be an effective intervention in decreasing avoidance behaviors. This intervention involves determining the criterion for the level of the target behavior and setting a time frame in which to accomplish that goal (Miltenberger, 2008). Goal setting has been used in a number of different areas in the behavior analytic literature, including high school and collegiate athletics (Brobst & Ward, 2002; Mellalieu, Hanton, & O'Brien, 2006; Smith, & Ward, 2006; Ward, & Carnes, 2002), staff management, (Gillat, & Sulzer-Azaroff, 1994), parent training (Sanders & Glynn, 1981), obesity treatment (Aragona, Cassady, & Drabman, 1975; Wooley, Wooley, & Dyrenforth, 1979), and homework performance (Miller, & Kelley, 1994).

A number of different approaches have been taken to goal setting. Typically, goal setting is used as part of a multi-component intervention (Brobst, & Ward, 2002; Gillat,

Sulzer-Azaroff, 1994; Miller, & Kelley, 1994; Sanders, & Glynn, 1981; Smith, & Ward, 2006; Ward, & Carnes, 2002). In some studies, goals are set by the researcher or therapist (Brobst, & Ward, 2002; Sanders & Glynn, 1981; Miller, & Kelley, 1994), while other studies have the participants set their own goals (Mellalieu, Hanton, & O'Brien, 2006; Ward & Carnes, 2002). Public posting of goals has also been used as part of goal setting interventions (Brobst & Ward, 2002; Smith, & Ward, 2006; Ward, & Carnes 2002), and researchers have also prompted participants to attend to their past success prior to setting the goal for the following session (Smith, & Ward, 2006).

Self-Monitoring. Self-monitoring may be another intervention that would be successful for behaviors associated with pool avoidance. Self-monitoring refers to identification and recording of target behaviors when they occur (Milteberger, 2008). Self-monitoring has been used to address a number of areas, including staff performance (Richman, Riordan, Reiss, Pyles, & Baily, 1988), work productivity (Ackerman, & Shapiro, 1984), residential electricity consumption (Winett, Neale, & Grier, 1979), frequency of cigarettes smoked (Foxx, & Brown, 1979), and academic performance (Dunlap & Dunlap, 1989; Harris, 1986; Maag & Reid, 1993).

Both goal-setting and self-monitoring have been successful in facilitating behavior change. The literature has focused on a number of areas, but there has been little use of goal setting and self-monitoring with clinical populations. The potential impact of these interventions in clinical populations is significant. Utilizing these techniques offers the opportunity to evaluate ones own progress as an intervention progresses. As the targeted behaviors begin to occur, participants track and evaluate their own progress. Initially, self-monitoring and meeting goals is frequently followed by praise. As they

further develop skills, these interventions may set up participants to contact natural contingencies of reinforcement, which may lead to lasting behavior change. A literature review was conducted and resulted in zero articles examining the use of goal setting and self-monitoring with behaviors maintained by negative reinforcement, such as phobic avoidance. Although it seems reasonable to suggest that goal setting and self-monitoring might be successful in decreasing phobic avoidance, especially if these interventions are combined with positive reinforcement and prompting. Therefore, the purpose of this study was to evaluate the effects of a multi-component package consisting of behavioral skills training, self-monitoring and goal setting, combined with positive reinforcement on phobic avoidance in the presence of a feared stimulus, in this case, pools. It was hypothesized that the combination of behavioral skills training, self-monitoring, goal setting, and positive reinforcement would show a decrease in phobic avoidance, and allow for the children to demonstrate confident water skills. It was also hypothesized that as children moved through the intervention, intervals of the session with fearful behaviors would decrease, while intervals of the session where the child has positive affect would increase.

Chapter Two: Method

Participants and Recruitment

Five participants were recruited for the study. Of the five, three participants between the ages of 3 and 7 qualified, and were recruited using public pools, after school programs and by word of mouth. Inclusion criteria required children were typically developing individuals and were reported to display a fear of swimming, whose behavior were hypothesized to be maintained by negative reinforcement by a functional behavior assessment. Children demonstrating the ability to complete step five (see figure 1), or more advanced skills independently were excluded from the study. Fear was assessed through the use of a brief assessment of skills.

Skills assessment. An assessment was conducted at private pools to ensure the participants qualified for the study. A video camera was present and all sessions were recorded for data collection purposes. Fearful behavior near water (see dependent variables for definition) was measured by breaking the total duration of the session into 15 s continuous intervals, was recorded as occurrence verses non-occurrence, and was reported as the percent of intervals in which the behavior occurred. Positive affect (see dependent variables for definition) was also recorded during the skills assessment, and was reported as occurrence verses non-occurrence. Positive affect was also reported as a percentage of intervals when positive affect occurred.

The therapist was responsible for conducting all of the assessment sessions. At the beginning of the skills assessment, the therapist was in the pool, and the parent brought

the child to the pool within 10 feet of the therapist. The parent returned to the bench or the side of the pool, and the therapist instructed the child, "Show me how you swim." The child then had the opportunity to voluntarily enter the pool and swim. The child was asked to swim once during the assessment. Performance was scored using a scale (see Figure 1). If the child refused to attempt to approach the pool, they were given a score of zero. If a child engaged in any avoidance behaviors (i.e. verbal refusal, crying, screaming, whining, running away, refusing to approach the pool, refusal to hold on to the wall of the pool without a parent holding them, refusal to put their face in and refusing to remove street clothing in preparation to get into the pool.), the therapist used planned ignoring (i.e. the therapist did not respond to any avoidance behaviors verbally, gesturally, or physically, and made little eye contact with the child while he was engaging in avoidance behaviors) for an average of 30 s. None of the participants requested to terminate session or leave during the assessment during baseline or intervention. If the child voluntarily participated and demonstrated a skill, the skill level was marked on a data sheet.

The child's confident water skills were given a criterion score based on criteria outlined in the predetermined scale (see Figure 1). In order to be included in the study, participants could score no higher than step five.

Participants. Sara was a three-year-old girl who displayed fear of swimming. Her mother reported she had been fearful of pools since birth. When brought into a pool, she would scream, cry, run away or whine to avoid the pool. No specific episode was identified which evoked fear of water. Her fearful behaviors near water included verbal

refusals (i.e. “I don’t want to get in the water,” “I’m scared”) and running away approximately 10 feet away from the pool or to a parent or relative outside of the pool.

Karen was a four-year-old girl who had displayed fear of swimming for two years. Her parents reported she had two occurrences where she had slipped and fallen under the water before being pulled out by her parents. Her parents had enrolled her in swimming lessons, which were unsuccessful because she would run away from her teacher. Her fearful behaviors included crying, verbal refusal (i.e. “I don’t think I can do this,” “It’s really hard”), clinging to the shoulders of the therapist, requesting a lesser skill when prompted to attempt a new skill and running away. Karen also had a sibling, Rob, and the parents reported that he was also fearful of learning to swim.

Rob was a seven-year-old boy who displayed fear of swimming. His parents reported he had one occurrence where he slipped and fell under the water before being pulled out by his teacher. His parents enrolled him in swimming lessons on two occasions with little success. Rob’s fearful behaviors were verbally refusing to attempt skills (i.e. “It’s too deep for me to get in,” “I can’t do that”), requesting to do a lesser skill when prompted to attempt a new skill, or refusing to enter the pool if he was unable to stand.

Setting. The study took place in private pools in locations close to where the participants lived. These environments were chosen for purposes of generalization to the child’s natural environment. Sessions occurred after school and on the weekends, and occurred a minimum of twice per week.

Dependent Variables

The dependent variables in this study were confident water skills, and goals met. Data were recorded on positive affect, and fearful behavior near water to evaluate

whether these changed throughout intervention. Confident water skills, and goals met were targeted for increase.

Confident water skills (CWS). CWS defined as the child behavior that occurred once the therapist provided an instruction, in which child engaged in the approximation of the requested behavior (e.g. taking a step towards the pool, etc.).

Goals met. Goals met were defined as when a child completed the skills outlined in the goal three or more times.

Positive affect. Positive affect was defined as smiling, making positive comments (e.g. “this is fun, I like this, awesome, etc.), and laughing.

Fearful behavior near water (FBNW). FBNW was defined for each child above, but could include verbal refusal to attempt a skill (e.g. no, I don’t want to, I’m too scared, etc), clinging to the shoulders of the therapist, crying, screaming, whining, running away, refusing to approach the pool (e.g. the child stays away from the edge of the water, when prompted to move towards the water, the child verbally states they don’t want to and/or moves further away from the pool, etc), refusal to hold on to the wall of the pool without an instructor holding them (e.g. the child may attempt to exit the pool or hold tightly to the instructor), refusal to put their face in (e.g. the child will verbally state they do not want to put their face in, and/or when prompted to put their face in, the child will keep their face away from the water) and refusing to remove street clothing in preparation to get into the pool (e.g. moving away from the pool or parents when prompted to remove clothing, verbal refusal to remove clothing).

Figure 1 outlines the task analysis of confident water skills outlined in the study. The steps began with verbal refusal to approach the pool, and progresses in sequential

steps until the child completely submerges their head. Participants were given the opportunity to demonstrate skills throughout baseline and intervention phases, however any participant demonstrating skills at step five (i.e. entering the water and holding onto the wall independently) or higher were excluded from the study.

Step	Definition
0	The child refuses to approach the pool
1	The child approaches the pool but does not get any part of their body wet
2	The child approaches the pool and get their body wet while standing on the side of the pool
3	The child approaches the pool and sit on the side of the pool with their feet and legs in the pool
4	The child enters the pool while held by the instructor and get their feet and legs wet
5	The child enters the water independently, stand on the bottom of the pool (or hold on to the wall if the child is not tall enough to touch the bottom)
6	The child enters the water independently, stand on the bottom of the pool (or hold on to the wall if the child is not tall enough to touch the bottom), and get their chin wet when prompted
7	The child enters the water independently, stand on the bottom of the pool (or hold on to the wall if the child is not tall enough to touch the bottom) and get their mouth wet.
8	The child enters the water independently, stand on the bottom of the pool (or hold on to the wall if the child is not tall enough to touch the bottom), get their mouth, ears and nose wet and blow bubbles
9	The child enters the water independently, stand on the bottom of the pool (or hold on to the wall if the child is not tall enough to touch the bottom), and get their entire face (i.e. chin, mouth, cheeks, nose and eyes) wet
10	The child enters the water independently, stand on the bottom of the pool (or hold on to the wall if the child is not tall enough to touch the bottom), and submerge their head (i.e. chin, mouth, cheeks, nose, eyes and hair).

Figure 1:

The chart above indicates the behaviors required to meet the criteria for each step of the intervention.

Functional Assessment

A functional assessment was conducted to determine the hypothetical function of the behaviors. A combination of indirect and direct assessments were conducted. Parents were interviewed using a semi-structured functional assessment interview (see appendix C) where they were asked questions about their child's behaviors in the presence of a pool, such as what the topography of behavior looked like, what antecedents occurred prior to the escape and avoidance behaviors, and how the parent responded to the behavior. Following the interview, parents filled out the motivational assessment scale (Durand, & Crimmins, 1988). Direct observations involved viewing video footage from the initial skills assessment and taking data on the antecedent, behaviors (i.e. fearful behaviors, positive interactions, and confident water skills), and consequences. An A-B-C data sheet, and an interval data sheet were used for data collection (see Appendix D and E). Based on the functional assessment, participants whose behaviors appeared to be maintained by negative reinforcement were selected to participate in the study.

Baseline

Following the functional assessment, baseline data were collected. The same session structure during the initial assessment was used in baseline. The child was given the opportunity to demonstrate skills, and scored accordingly. The trials were terminated upon the child's request. If the child did not request termination, the trial was terminated following the demonstrations of the skill.

The child was instructed, "Come over here." If the child approached the pool, they were then instructed, "Show me how you swim." Baseline was run until the data stabilized, with a minimum of three trials to demonstrate stability in the data. Once the

child demonstrated the skills following the first statement of instructions, they were given a short break lasting between five seconds and two minutes. Following the break, they were given the instructions again. After the child demonstrated skills in baseline trials, the child was told to get their towel. Participants that exceeded step five (See Figure 1) were excluded from the study.

Intervention

Preference Assessment. Both the parent and child were interviewed prior to conducting the preference assessment. The parent was asked questions about various edible and tangible items that may serve as reinforcers for the child. The child was interviewed following the last baseline session, and participated in a multi-stimulus without replacement preference assessment (Hagopian, Long, & Rush, 2004) following baseline, but prior to beginning the multi-component intervention.

The preference assessment utilized preferred items as indicated by the parents, and additional items were added if the child indicated additional items. Approximately 8-10 items were presented during the preference assessment, and the child indicated preference by picking an item. Once a choice was made, the item was marked on a data sheet and removed from the presented items. This process was repeated until all of the items were selected. This established a hierarchy of preferred items. The five most highly preferred items were present at each session and used as a reinforcer when the child met the goals for the day. If the child met two of the three goals set for the day, the child selected a reinforcer from the five most highly preferred items. The child was presented with the five most highly preferred items and instructed to pick one for meeting the second goal. If the child met three of the three goals set for the day, the child received

two of the preferred items. Each week, an informal preference assessment was conducted. The child was asked what item they wanted and they indicated preference by verbally stating the items they wanted to work for and other items they would select in the future. This ensured that highly preferred items were always available.

Treatment Package. The treatment package consisted of Behavioral Skills Training, goal-setting, self-monitoring, and positive reinforcement.

Behavioral Skills Training. Behavioral skills training (Miltenberger, 2008) was utilized to teach each skill required to meet the goal. For each skill, the instructor performed four steps. First, the instructor provided instructions on how to complete the skill. Second, the instructor modeled the skill to demonstrate how to correctly perform skill. Third, the child was provided with an opportunity to rehearse the skills. Fourth, the instructor provided specific feedback on the child's performance and then rehearsed the skills again (e.g. "nice job putting your mouth in the water Karen! Remember, when we try to blow bubbles, we need to blow air slowly next time, let's try again).

Self-Monitoring. During each session, following each trial, the child and therapist went to the wall and checked off whether the child engaged in the skills on the self monitoring form (Appendix A). This form listed the skills targeted for the day, along with corresponding boxes to check whether the child engaged in the skill or did not engage in the skill.

Goal Setting. At the beginning of each session, the therapist sat down with the participant and set three goals for the day. Goals were based on the current ability, as established in the previous session (i.e. the highest skill demonstrated in the previous session), as well as skills related to the next sequential step. Goals were verbally

discussed, then written down on the self-monitoring form. The children were required to demonstrate the behaviors outlined in each goal three times before progressing to the next goal.

Session Structure. At the beginning of each session, the therapist approached the child and greeted them with positive affect (i.e. smiling, asking about their day, and how they are doing.) Once the child was greeted, the therapist and the child sat down together and used the goal setting sheet (see appendix A) to write three goals for the day. The first goal consisted of the most advanced skills demonstrated in the prior baseline or intervention session. Skills were determined as more or less advanced based on the steps (see Figure 1).

The second goal was the next approximation towards completing the next step (see Figure 1). For example, if the child had mastered steps 1-3, the goal may have involved entering the water and getting their feet wet when held by the instructor. Although step four outlines the child must enter the water assisted by the instructor and get both their feet and their legs wet, the second goal could also be an approximation toward the next step to ensure the full success of the child. The third goal may have involved the completion of the full step, or another approximation towards the next step. The purpose of the second and third goals were to use shaping to develop confident water skills through differentially reinforcing more advanced approach behaviors. The child determined all goals with the therapist, and goals were based on the child's previously demonstrated skills (i.e. steps they had mastered in the previous trials) and the number of times the child previously attempted skills. Goals were written on a laminated sheet of

paper, and were brought to the side of the pool to remind the child of the goals that were set for the day.

Following goal setting, the child and therapist approached, or entered the water (depending on the current step) and began working on the skills. The therapist reminded the child of their success the previous session and provided praise statements about the previously demonstrated behaviors. They then provided behavioral skills training (i.e. instructions, model, rehearsal, and feedback) to review the skill, and had the child demonstrate the skill three times. The purpose of rehearsing a previously demonstrated skill was to demonstrate the skill from the previous session, showing maintenance of the skill. Following this skill, the children were more likely to demonstrate more complex skills that may evoke more covert behaviors, thus resulting in overt fearful behaviors. The purpose of demonstrating the skill 3 times was to establish a stable level of data illustrating mastery of a skill.

During the lesson, if the child verbally indicated they want to attempt a more advanced skill, or voluntarily attempted a more advanced skill than those outlined in the goals, the child was taken to the side of the pool, and the goal was changed to reflect the more difficult skill. The child was then provided behavioral skills training for the skills outlined in the new goal.

The participants were verbally prompted to attempt the skills three times. If at any point a child indicated verbally that they wanted to stop, the therapist used a three prompt hierarchy to attempt to provide the child with additional opportunities to engage in the task. The therapist first stated; “Rob, you’re doing such a great job today, let’s try it, one, two, three, go!” If the child still refused to try the skill, the therapist provided a second

prompt, “Rob, do you remember what our goal was yesterday? That’s right, putting your chin in, and you did it! What’s our goal for today? Alright, let’s give it a try.” If the child still refused, a final prompt was provided, “Johnny, your goal for today is putting your nose in. It’s very important that we give it a try, can you do that for me?” If the child refused a fourth time, the session was terminated, and the therapist provided minimal social interaction (i.e. the therapist did not respond to any avoidance behaviors verbally, gesturally, or physically, and made little eye contact with the child while he was engaging in avoidance behaviors), assisted the child out of the pool, and then the child exited the pool and left the pool area. This only occurred once across the participants

If the child attempted and successfully completed the goal three times, the therapist and the child approached the side of the pool and the child checked off the attempts on the goal setting sheet. The child and therapist began working on the next goal, or terminated the session if the third goal was completed. If the child refused to attempt the skills, lack of attempts were checked on the goal-setting sheet by the child. Skills were checked off following each attempt of a skill.

Following the end of the session, the child and the therapist reviewed the goal setting sheet to monitor the day’s progress. Positive reinforcement was provided using differential reinforcement and shaping. If the child met the first goal three times, they did not receive a preferred item, because they had already demonstrated the skill in the previous session. If the child met the second goal less than three times, the child was given behavior specific feedback, told why they would not earn a preferred item, and told they could try again during the next session, as outlined above. If the child met the second goal three times, they were given behavior specific praise and told they could

select one preferred item (e.g. “you did an awesome job getting your feet and legs wet when you got in the water with me! You can pick a silly band!”). If the child met goal two three times, but met the expectations for goal three less than three times, the child was given behavior specific feedback and was able to select one preferred item. If the child met the criteria for the third goal three times, the child was able to select two preferred items. If the child met the first goal less than three times, the child was given behavior specific feedback, told why they will not earn a preferred item, and told they could try again during the next session (e.g. “Sara, I liked how you got into the water with my help, but you did not put your legs in the water, tomorrow, we can try again and you’ll have another chance to earn a silly band”). Following the self-monitoring and reinforcement, the therapist said goodbye to the child and the session was ended.

Interobserver Agreement (IOA)

Interobserver agreement was calculated using the video from each session by two independent observers. Confident water skills were reported as attempted skills based on figure 1. Raters were required to have step-to-step accuracy with IOA, and were trained on what a completed step and a partially completed step looked like. Positive affect and fearful behaviors were recorded breaking the trials into 15 s continuous intervals and utilizing a partial interval recording to indicate occurrence verses non-occurrence of the target behaviors. The number of intervals where the behavior occurred was divided by the total number of intervals and data were represented as percentage of intervals with occurrence of the behaviors. IOA was conducted for 44 percent of sessions and across all participants and phases, and demonstrated 100% agreement across sessions. Each observer recorded data for every participant during baseline and intervention.

Interobserver agreement was conducted for 44% of sessions, and reported 100% agreement during observations.

Social Validity

Child reported social validity. At the end of the session, the child answered three questions on the self-monitoring form on a five point likert scale, which was modified to reflect smiley faces indicating how they felt. Following the selection of a preferred item, the therapist asked the child to respond to each question on the survey, indicating if they strongly agreed, somewhat agreed, were neutral, disagreed, or strongly disagreed. The questions asked if the child liked what they worked on that day, if they thought what they worked on was hard, and whether they thought swimming was important.

Parent social validity. Upon completion of the intervention, parents were asked to fill out a brief social validity questionnaire to assess their attitudes towards the intervention. The questionnaire (Appendix B) asked whether parents felt the intervention helped decrease their child's fear, whether it helped them gain the skills required to begin swimming lessons, and whether they would recommend the intervention to a friend with a fearful child.

Design

This study used a changing criterion design for Sara. A concurrent multiple baseline design was utilized for Karen and Rob to demonstrate control across these two participants. Karen also had an embedded ABAB reversal design, which was used to demonstrate within subject control.

Chapter Three: Results

Functional Assessment

The functional behavior assessment results indicated the behaviors for all three participants were likely maintained by negative reinforcement in the form of escape from demands related to swimming and the pool.

Sara's mom reported that prior to beginning baseline sessions, she was frequently picked up and brought into the pool, despite her refusals. When Sara was prompted to attempt a skill and was not forced into the pool, she would run away, engage in verbal refusal, or other verbally state reasons she couldn't try the skill (e.g. "I can't get in! It's too hard!"). As a result, she was allowed to remove herself from the pool and stand outside the pool. Direct observation and results of the MAS indicate that the behavior was maintained by negative reinforcement in the form of escape.

Karen's parents attempted to get her to learn to swim through using swimming lessons. When prompted to attempt a skill by a parent or instructor, Karen would run away from her instructor, verbally refuse, and cry. When prompted to attempt a skill by the therapist, Karen sat by the side of the pool, pulled her arms and legs close to her body, folded her arms, and verbally refused (e.g. "I just don't want to do this"). These behaviors resulted in removal from the pool or swimming lessons, and removal of the demand during the assessment. The results of the assessment and MAS indicated the behaviors were maintained by negative reinforcement in the form of escape.

Rob's parents were also Karen's parents. He had attempted swimming lessons unsuccessfully twice. Rob would enter the water and sit on the stairs, however when asked to attempt a skill in session, Rob would make excuses verbally to escape the task (e.g. "well I can't try it here because my feet don't touch, I can't get in because I have a scrape on my foot,"). This would result in his parents allowing him to remove himself from the demands; sometimes they would also attempt to accommodate his needs (e.g. providing a Band-Aid for a scraped foot), however, this attention or accommodations was not consistently provided and the escape behaviors would continue regardless of was provided or not. Rob's behaviors were also maintained by negative reinforcement in the form of escape, as indicated by the results of direct observation and the MAS.

Intervention Results

Confident water skills. Results of the intervention demonstrated the implementation of a multi-component intervention comprised of behavioral skills training, goal setting, self-monitoring, and positive reinforcement was effective in increasing confident water skills. Figure 2 shows Sara's data for confident water skills, as well as intervals with fearful behaviors and positive affect. As indicated in the top graph, Sara's display of confident water skills shows immediate variability in baseline, but eventually stabilized (Sara baseline; M= Step 1). During intervention implementation, Sara's data shows an increasing trend (Sara intervention; M= step 7.1) and indicate that she exceeded the goals she set for herself in the first and second intervention sessions. When Sara exceeded her goal, goals were reset to reflect more difficult tasks and Sara attempted the new tasks. This is why trial 9 reflects one attempt at step 4 before moving to step 5 in trial 10. During trial 52, Sara put her face in the water, exceeding the

previously set goal. The following session, Sara demonstrated fearful behaviors during the beginning of session and refused to approach the pool. The prompt hierarchy (see Method) was utilized and Sara was able to complete the study, demonstrating the final step three additional times.

Figure 3 shows confident water skills for Karen and Rob. Karen's data shows a stable baseline (Karen baseline; $M=3$). During intervention, Karen's confident water skills did not result in an immediate, robust change in the level, but after three trials, data shows an increasing trend (intervention; $M = 3.75$). During trials 13 - 15, a return to baseline was implemented because Karen's data did not demonstrate robust effects upon the implementation of the intervention (second baseline $M=3$). In order to demonstrate experimental control, Karen was returned to baseline and Karen's data returned to a stable baseline, demonstrating experimental control. Following the return to baseline, Karen's data shows an increasing trend with some variability (second intervention; $M=7.1$). Karen required three intermediate steps. Step 3.5 indicated sitting on the wall and kicking her legs which is represented in trials 7-9. Step 4.5 indicated being held by the therapist and kicking her legs while moving around in the pool, which is represented in trials 17-19. Step 8.5 indicated putting the top of her nose in the water for a duration of approximately 2 s which is represented in trial 57-59.

Rob remained in baseline during Karen's reversal and his data remained stable throughout baseline (baseline; $M=3.1$). His data shows an increasing trend during intervention (intervention; $M=7.7$). He exceeded goals set during 2 of his 3 intervention sessions. Rob also required the intermediate step, 8.5 (i.e. putting his nose under water

for 4 s) during trials 36-41 because he demonstrated fearful behaviors and was unwilling to attempt step 9.

Positive affect and fearful behaviors. Intervals with positive affect and fearful behaviors are indicated in Figure 2 for Sara, and Figure 4 for Karen and Rob. Sara's data demonstrated high levels of fearful behaviors during baseline (M=73.2%), but fearful behaviors decreased during intervention at trial 6 (M=11.8%). The data illustrates an increase in fearful behaviors during trial 24, corresponding with the attempt to complete step 10 in confident water skills. During trials 25-29, fearful behaviors were elevated from trials 6-24, but reduced to near zero levels during the rest of the intervention. Karen's results were variable. During her initial baseline, she demonstrated high levels of fear (M=100%). Upon the initial intervention, she demonstrated decreased fears (M=16.6%). When she returned to baseline, her fear elevated (M=66.6%), and upon her final intervention, she demonstrated less fearful behaviors (M=43.7%), Rob's data demonstrated high levels of fearful behaviors during baseline (M=100%) with a robust decrease in fearful behaviors in intervention (M=16%).

Finally, Figure 5 indicates the data representing the total duration of sessions, as well as the total percent of intervals with fearful behaviors or positive affect for each child. Sara demonstrated high levels of fearful behavior during session 1, which decreased throughout sessions 2-4. Her positive affect demonstrated an increase from baseline trials 1-5 (baseline; M=10%) to intervention (M=36.6%). Karen demonstrated variability in her data, her first baseline demonstrated a low levels of positive affect (M=0%). Upon intervention she demonstrated higher levels of positive affect (M=83.3%). Karen was then returned to baseline showing lower levels of positive affect

(M=0%) and upon the final intervention, positive affect increased (M=33.6%). Rob showed low levels of positive affect during baseline (M=0%). Intervention showed a slight increase in positive affect (M=25.9).

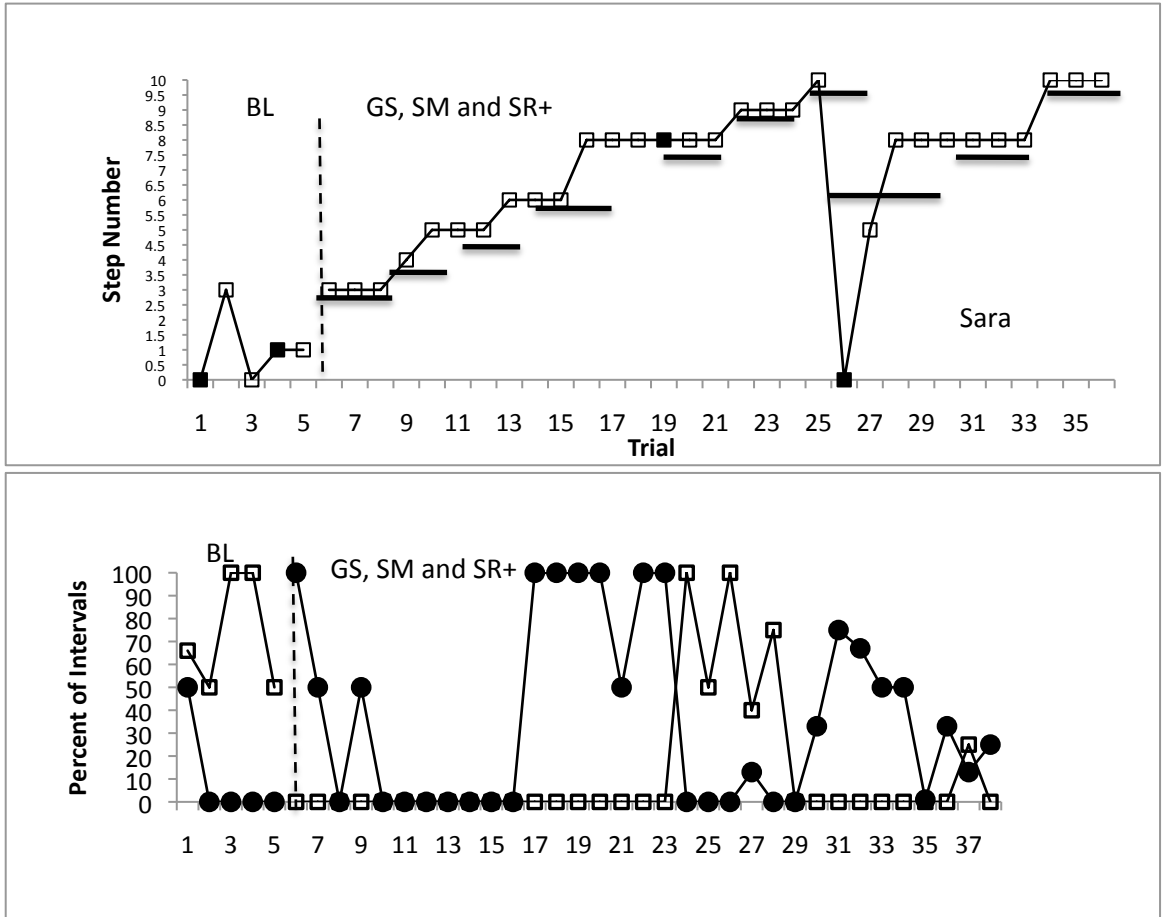


Figure 2:

Figure 2 indicates Sara's confident water skills, fearful behaviors, and positive affect during session. In the top panel, filled data points indicate the first attempt of the session. In the bottom panel, filled circles indicate intervals with positive affect and open squares indicate intervals with fearful behaviors.

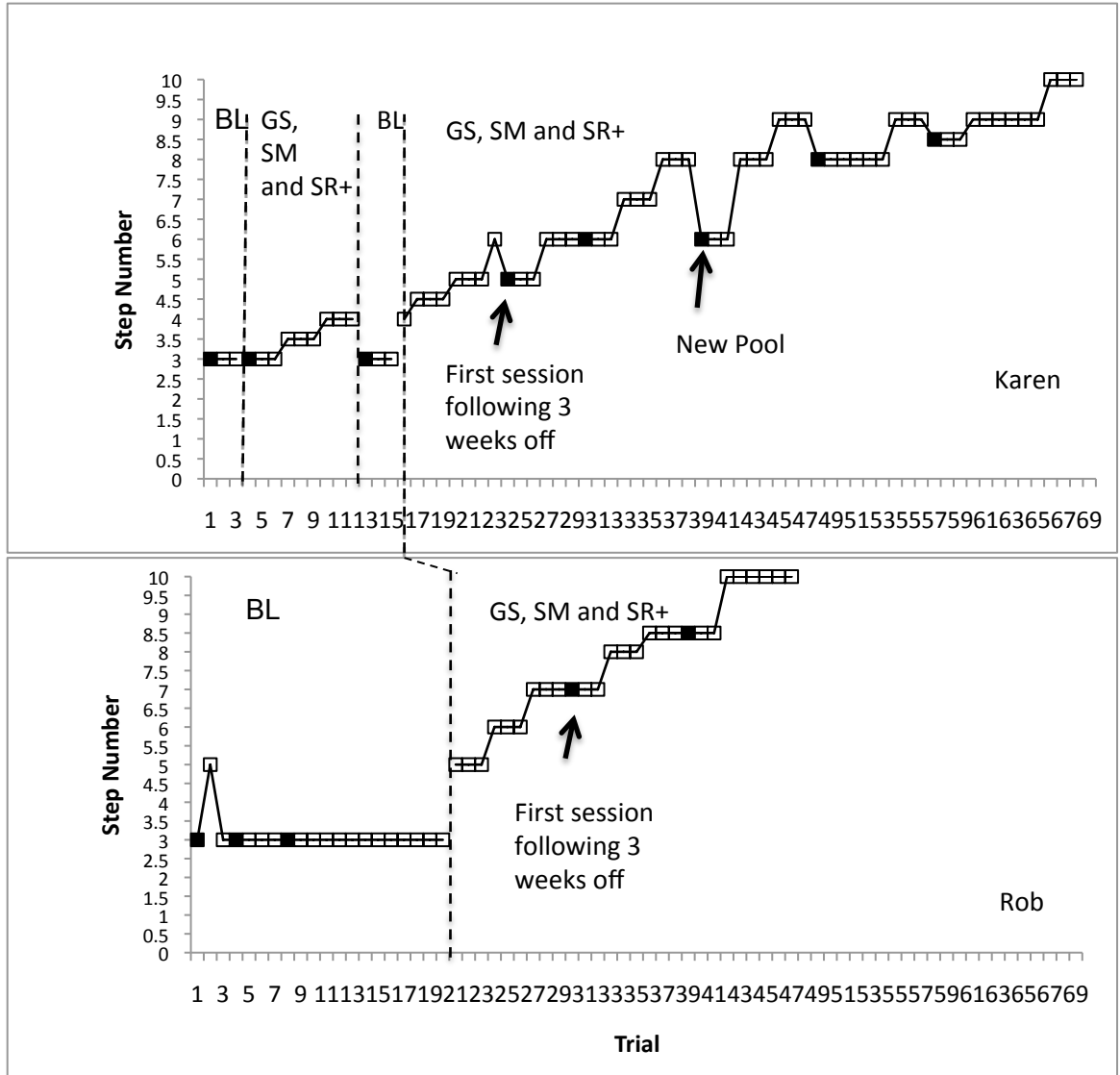


Figure 3:

Figure 3 indicates Karen and Rob's confident water skills. The filled squares indicate the first trial of each session. Karen's trial 26 and Rob's trial 31 indicate the first session after a three week break, due to Karen's hospitalization.

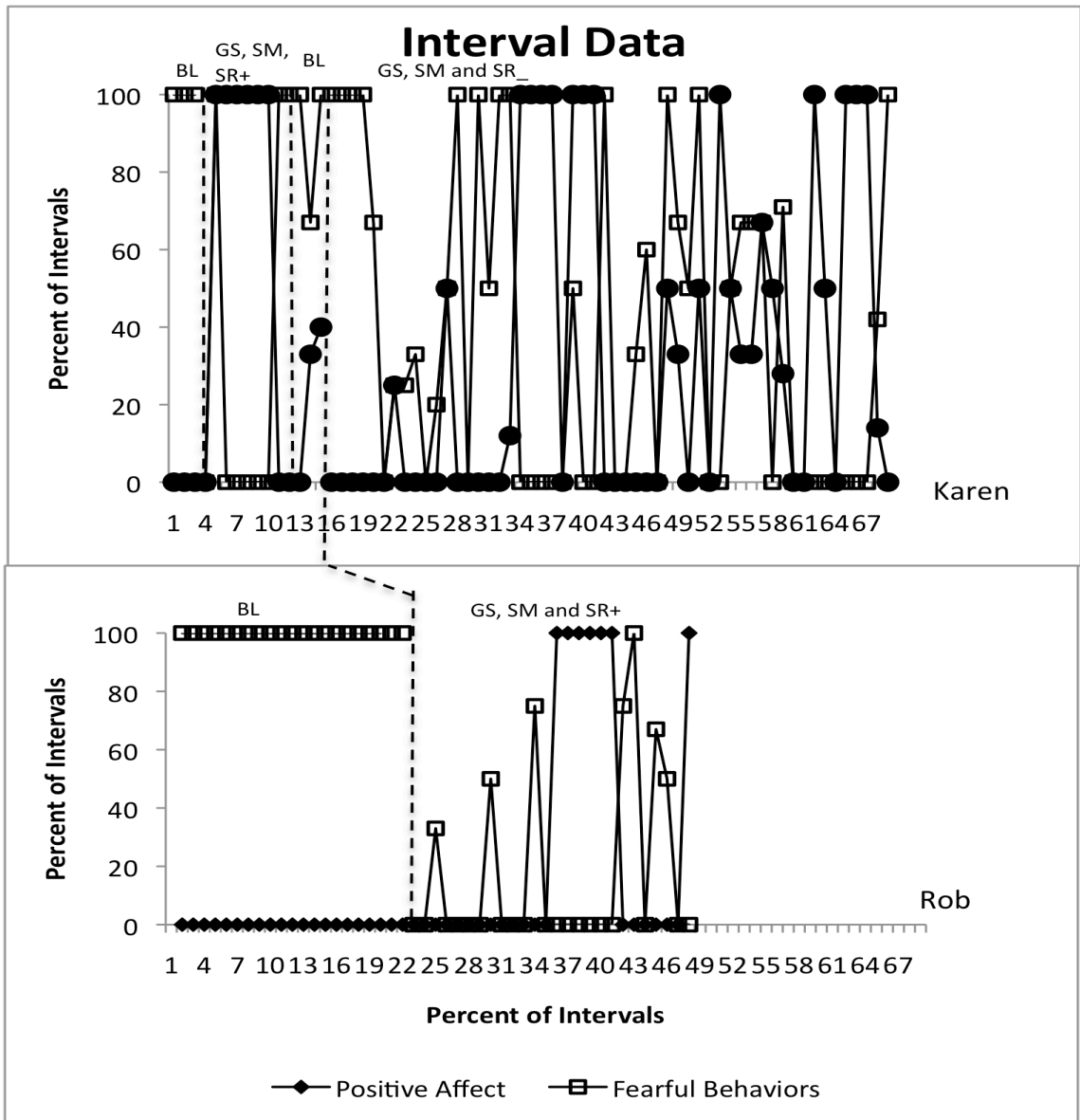


Figure 4:

Figure 4 illustrates Karen and Rob's intervals with positive affect and fearful behaviors.

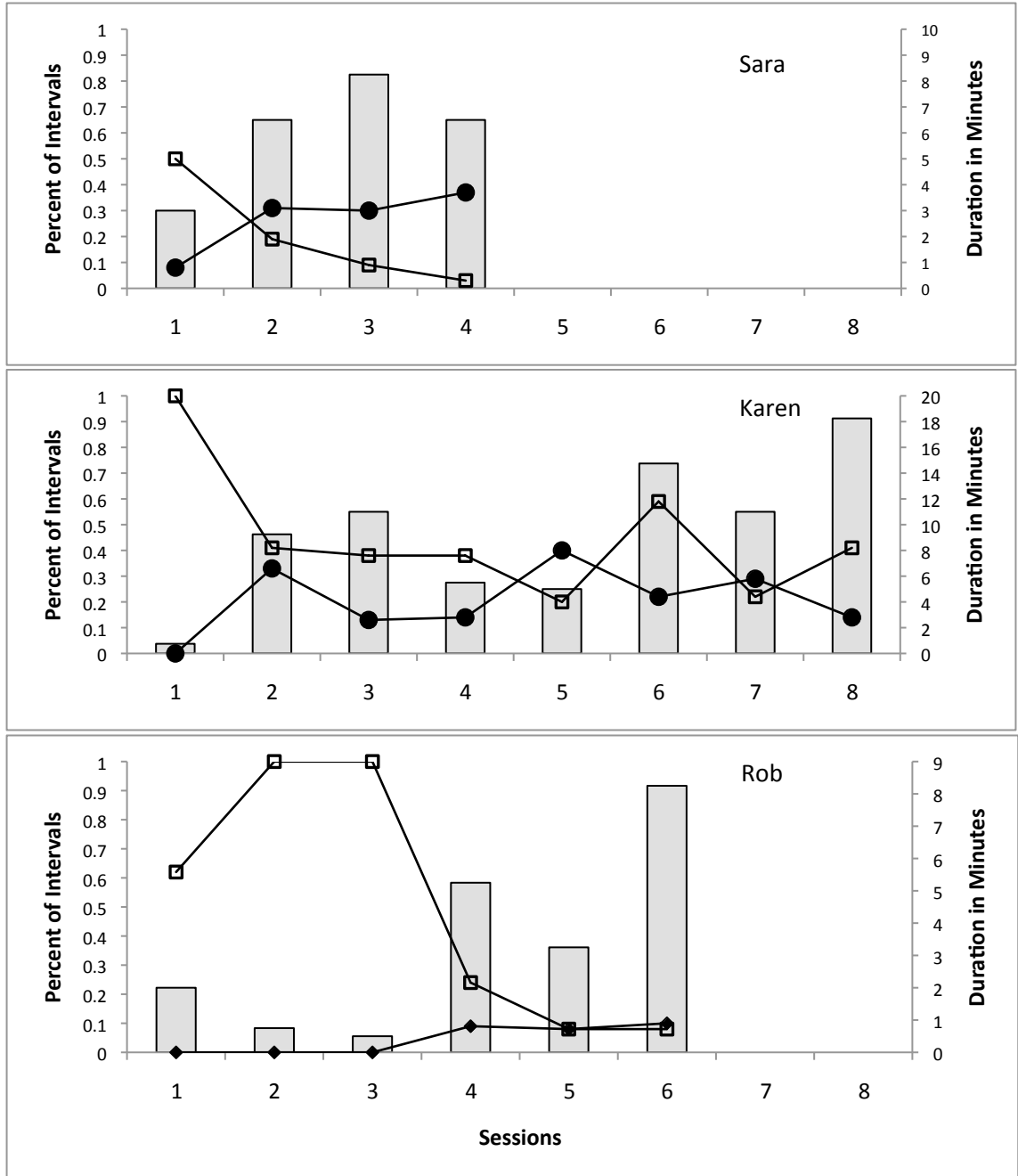


Figure 5:

Figure 5 indicates the intervals with positive affect and fearful behaviors. The round and square data points indicate the percent of intervals where positive affect and fearful behaviors were present. The grey bars indicate duration in minutes, and correspond with axis on the right.

Social Validity

Social validity measures were collected following each intervention session, table 1 indicates a break down of responses. Sara rated a mean score of 1, that she strongly agreed that she enjoyed what was worked on during each session, and that she thought it was important to learn to swim (M=5). She also reported a mean score of 2, indicating she somewhat agreed that the skills were hard (rated 2). Karen was variable in her reports. After each session she reported she strongly agreed that she liked the targeted skills (M=1) and that she thought the skills were hard (M=1.37). Her report of the importance of learning to swim varied between somewhat agreeing and strongly agreeing across sessions (M=1.1). Following each session, Rob varied also in his responses; his mean score was 1.6 when asked if he liked what we worked on that day. He indicated a mean score of 1 when asked if he thought swimming was important. Finally, when asked about the difficulty of the skill, his mean reported score was 1.6.

Parents also provided a social validity report, indicated in table 2. All parents stated they would strongly agree that they would recommend the intervention to a friend (rated 1). Rob and Sara's parents also reported that they strongly agreed that the intervention helped their child get over their fears (reported 1), gain confidence in their swimming ability (rated 1), increase their child's ability to enjoy swimming and helped prepare their child for swimming lessons (rated 1). Karen's parents reported more variable results; both of her parents stated they somewhat agreed that the intervention helped her get over her fears and gain confidence in her swimming ability (rated 2). Her parents reported they were neutral when asked if they felt the intervention lead her to enjoying swimming

Table 1

Participants Mean Social Validity Results

Question	Sara	Karen	Rob
I liked what we worked on today	Mean = 1 Range = 1-1	Mean = 1 Range = 1-1	Mean = 1.6 Range = 1-3
I thought the skills we worked on today were hard	Mean = 2 Range = 2-2	Mean = 1.37 Range = 1-2	Mean = 1.6 Range = 1-2
I think it is important to learn how to swim	Mean = 1 Range = 1-1	Mean = 1.1 Range = 1-2	Mean = 1 Range = 1-1

Note: A rank of 1 indicates most preferred and a rank of 5 indicates least preferred.

Table 2

Parent's social validity results

Question	Sara's	Karen's Parents		Rob's Parents		
	Parent	Mom's	Mom's	Dad's	Mom's	Dad's
	Report	Report	Report	Report	Report	Report
I feel the intervention helped my child overcome their fears	1	2	2	1	1	
I feel the intervention helped my child gain confidence in their swimming ability	1	2	2	1	1	
I feel the intervention has lead my child to enjoy swimming more	1	3	3	1	1	
I feel the intervention helped prepare my child to be more successful in swimming lessons	1	3	2	1	1	
I would recommend this intervention to a friend with a fearful child	1	1	1	1	1	

Note: A rank of 1 indicates most preferred and a rank of 5 indicates least preferred.

more (reported 3). Karen's mom was neutral (reported 3) when asked if the intervention helped prepare her to be more successful in swimming lessons, while Karen's dad reported he somewhat agreed (reported 2).

Chapter Four: Discussion and Limitations

The results of the multi-component intervention resulted in an increase in confident water skills for each participant. Each child was able to demonstrate confident water skills and complete the outlined task analysis in a maximum of eight sessions. This is especially notable considering all three children were frequently exposed to water, and two participants had been unsuccessful in swimming lessons previously. If it is possible to increase confident water skills in such a short number of sessions, this intervention may be feasible to incorporate within the context of traditional learn-to-swim programs to increase retention of fearful children in these programs.

While the results of this study indicated the treatment package was successful in increasing confident water skills, there were a number of limitations to this study. The multi-component intervention was comprised of behavioral skills training, goal-setting, self-monitoring, and positive reinforcement. It is unclear whether individual components, or a combination of the techniques would be effective in increasing confident water skills, or if a component lead to additional fearful behaviors. During intervention, goal setting may have elicited fearful behaviors. Following goal setting before trial 26, Sara refused to enter the pool. During goal setting, when asked to target more challenging skills, Karen set goals significantly lower than her previously demonstrated level. To determine if goal setting evokes fearful behavior, future studies may consider evaluating various types of goal setting such as increasing goals only after a predetermined reduction in fearful behavior has been observed.

Another factor to consider is accuracy in self-monitoring. During this intervention, the children's self-monitoring was supervised by the therapist to ensure accuracy. However, Sara reported she met the goals for trials 67-69, when she did not complete steps in the outlined goal. The therapist gave her behavior specific feedback (e.g. "You put your face in the water, to meet your goal you need to put your head in the water and get your hair wet")

Another potential limitation was the exposure to water outside of session. Parents were asked to not take their children to the pool during the course of the study and their reports indicated there was no additional exposure to pools between sessions. However, bath time would provide the opportunity to practice skills in a more controlled environment, which could increase confident water skills, which subsequently could have generalized to sessions. However, it is important to recall that two of the three participants had unsuccessfully taken swimming lessons, and the last participant had frequent exposure to pools. If exposure in the bathtub alone was significant in changing the behaviors, we would expect to see generalization to the pools during baseline, which was not observed. It is possible that, even if the participants rehearsed the skills in the bathtub, the magnitude of the demand was lesser in the bathtub than it was in the pool.

Another limitation is that intervals of the session with positive affect and fearful behaviors were reported, but not controlled for with the implemented intervention. However, the data did demonstrate changes that corresponded with conditions. Rob's data indicates that despite robust increases in confident water skills, as well as significant decreases in fearful behaviors, positive affect showed a slight increase. Sara's data showed an inverse relationship; as fearful behaviors decreased, positive affect increased.

Karen's data did demonstrate a slight decreasing trend in fearful behaviors and a slight increasing trend in positive affect, however they were very minor. The differences may be a result of differing levels of fear in baseline. Baseline measures examined the child's willingness to demonstrate confident water skills, and were limited to overt demonstrations of fearful behaviors (e.g. verbal refusal, running away). Future studies may consider utilizing an anxiety rating scale to attempt to evaluate pre- and post measures of fear, to evaluate whether covert fearful behaviors were present.

Another consideration is the method of defining positive affect. Positive affect was defined smiling, making positive comments (e.g. "this is fun, I like this, awesome, etc.), and laughing. This was defined by the researchers and may not have been sensitive to each child, as the definition was not modified based on the child's behaviors. Additionally, Karen demonstrated what appeared to be nervous laughter; laughing while refusing to attempt a skill. This further illustrates the need to individualize the definition of positive affect for each child.

Given the percent of intervals with fearful behaviors present, in particular with Karen, it is possible that other variables influenced the children's social validity reports. Social validity reports were given at the end of session, following positive reinforcement. The therapist asked the children three questions about the session (see Appendix A). Children may have reported they strongly agreed that swimming was very important, and that they enjoyed swimming if they were concerned about being rude to the therapist or felt disagreeing could impact the future likelihood of contacting reinforcement for meeting goals. Future research may examine whether children report differently when

parents ask for social validity measures, versus therapists asking about social validity measures.

Finally, the original task analysis outlined was required modification to increase confident water skills. This demonstrates the need for flexibility with standardized curriculum (i.e. the task analysis) in practice. As the intervention progressed, half steps were required to demonstrate control over the intervention in order to ensure success. It seemed the demand of moving between steps 8 and 9, was particularly difficult for participants, as it involved going from submerging their nose to submerging their eyes. Based on the results of this study, it appears that different steps in the task analysis may present different levels of demand for different children. Because we did not establish an anxiety hierarchy for the participants, it is not possible to speak definitively to this. Future research may consider establishing a hierarchy or establishing a survey to evaluate the demands that evoke the most fear in this population.

Other studies should investigate other ages or populations, to evaluate the generality of this study. Participants in this study were typically developing, Caucasian, middle class children. Evaluation of other populations, such as children with autism, or children from lower income homes, may reflect different results due to factors such as frequency of exposure to pools or the intensity of fearful behaviors.

The current study has contributed to the current phobia literature in several ways. By establishing a clear identification of function, we were able to ensure the correct intervention was implemented. The authors were unable to find any published literature that conducted a functional assessment to identify function prior to intervention.

This is the second behavior analytic study that utilized single-subject designs with water phobia, as it relates to learning to swim. This study also has implications for new approaches in phobia work. Past behavior analytic approaches have utilized distraction, extinction, and prompting, among other interventions. While these approaches have been very effective, they rely heavily on the presence of a therapist. Additionally, extinction may lead to participant drop out, as it may increase emotional responding in the presence of a feared stimulus. Rather than using an intervention that relied heavily on the therapist, this study emphasized self-monitoring. It is possible that self-monitoring may lead to more natural contingencies of reinforcement related to covert verbal behavior associated with the progress made in intervention. If ABA is going to be effective in treating phobias and anxiety, it will be important to not only provide systematic exposure, but also teach individuals to contact natural contingencies of positive reinforcement through exposure to feared stimuli.

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Appendices

Appendix A

How did I do today? Goal 1: Put my chin in the water

Did I try?	Trial 1	Trial 2	Trial 3	Trial 4	Trial 5
Yes					
No					

Goal 2: Put my cheeks in the water

Did I try?	Trial 1	Trial 2	Trial 3	Trial 4	Trial 5
Yes					
No					

Goal 3: Put my nose in the water

Did I try?	Trial 1	Trial 2	Trial 3	Trial 4	Trial 5
Yes					
No					

Please use the scale below to rate your feelings on this program

1	2	3	4	5
Strongly		Neutral		Strongly
Agree				Disagree

I liked what we worked on today

1 2 3 4 5

I thought the skills we worked on today were hard

1 2 3 4 5

I think it is important to learn how to swim

1 2 3 4 5

Appendix B

Parent Social Validity Questionnaire

Please use the scale below to rate your feelings on this program

1	2	3	4	5
Strongly		Neutral		Strongly
Agree				Disagree

I feel the intervention helped my child get over their fears

1 2 3 4 5

I feel the intervention helped my child gain confidence in their swimming ability

1 2 3 4 5

I feel the intervention has led to my child enjoying swimming more

1 2 3 4 5

I feel the intervention helped prepare my child to be successful in swimming lessons

1 2 3 4 5

I would recommend this intervention to a friend with a fearful child

1 2 3 4 5

Appendix C

Semi-structured Interview Script for Assessment

1. When did [Child's Name]'s fear of swimming begin?
2. What types of things will she do when you ask her to begin swimming?
3. How do you respond when she does these things?
4. How long do these behaviors usually last?
5. Do these behaviors happen more with you, or another person? Are the behaviors pretty similar across people?
6. If we were going to pick a few things to use as rewards for her swimming, what might she like?

Appendix D

Please mark the antecedents, behaviors and consequences for each behavior

Date/Time	Antecedent	Behavior	Consequence

Appendix E

Interval Data Sheet

Check each interval with occurrences of Positive Affect of Fearful Behaviors

Positive Affect (0 min – 5 min)

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Fearful Behaviors (0 min – 5 min)

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Positive Affect (5-10 min)

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Fearful Behaviors (5-10 min)

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Positive Affect (10-15 min)

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Fearful Behaviors (10-15 min)

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Positive Affect (15-20 min)

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Fearful Behaviors (15-20 min)

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Appendix F

Semi-Structured Script

Baseline:

Materials Needed

- Video Camera

1. Approach the parent and child by the side of the pool and greet the parent and the child.
2. Allow them space to prepare to enter the water, at this time, the therapist should set up the video camera to record, then should approach the pool and get in.
3. Once the child is prepared (i.e. street clothing has been removed, the child is in their bathing suit), the therapist will provide the instructions, “come over here,” then, “show me how you swim.”
4. Allow the child to demonstrate the skills, then allow for a brief 2-3 minute break where the child is with their parent, then begin another trial by stating, “show me how you swim.”
5. Following the second trial, allow the child to exit the pool and get their towel. Do not provide any praise for these trials. Thank the parent and child for their time and allow them to leave the pool.

Preference Assessment:

Materials Needed

- Video Camera
 - 8-10 preferred items
 - Goal Setting and self-monitoring form
1. Prior to the child's arrival, locate an area to conduct a preference assessment.
 2. Set up the video camera to record the preference assessment.
 3. Set up the preferred items in front of the camera.
 4. Upon the child's arrival, greet the parent and the child as they approach.
 5. Sit down with the child in front of all of the preferred items. Tell the child, "pick your favorite thing,"
 6. After the child picks an item, allow them to eat the item or interact with the item for 30 s. Then remove the item and have the child pick another item from the remaining items. Continue assessing preference until the child has picked between the last two items.
 7. After the child has selected between the final two items, explain to the child how future sessions will be conducted:
 - a. Remember, we're here to learn how to stop being afraid and learn how to swim! Each day before we set swimming, we're going to set some goals for ourselves for that day.
 - b. Show the child the goal setting and self-monitoring form.

- c. Then explain to the child, “we’ll then get in the pool and practice our swimming. We’ll keep track of how you do, and you can earn some of these things you picked today.”
 - d. Ask the child if they have any questions, and answer questions accordingly.
8. If the child has no questions, thank them, and tell them goodbye.

Intervention:

Materials Needed

- Video Camera
- Goal Setting Sheet
- Reinforcer items

Materials Needed

- Video Camera
- Goal Setting Sheet
- Reinforcer items

1. Greet the parent and child as they approach
2. Allow them space to prepare to enter the water, at this time, the therapist should set up the video camera to record, then should approach the pool and get in.

3. Once the child is prepared (i.e. street clothing has been removed, the child is in their bathing suit), approach the child and sit down.
 - a. Discuss the previous sessions progress and set goals for that current session.
4. Once goals have been set, enter the pool and begin practicing the skills, providing instruction using behavioral skills training.
5. After the child rehearses the skills, have them monitor their progress using the self-monitoring sheet.
6. After the child has completed their attempts at the goal, exit the pool, review the session progress, and provide reinforcement if two or more goals are completed.
7. After the child has been given the reinforcer of their choice, thank them for participating and say goodbye.

Appendix G

Transition Check List

Please circle any occurrences of problem behaviors during each part of the transition to session, and approximately how long the problem behaviors last. If the behavior is not listed, please write the behavior in under "other."

1. Transition from home or school into the car

Circle Behavior:

Verbal Protest Whining Crying Screaming Other: _____

Circle approximate amount of time:

0-5 min 5-10 min 10-15 min 15-20 min 20-25 min 25 min or more

2. During the car ride

Circle Behavior:

Verbal Protest Whining Crying Screaming Other: _____

Circle approximate amount of time:

0-5 min 5-10 min 10-15 min 15-20 min 20-25 min 25 min or more

3. Transition from the car into the locker room

Circle Behavior:

Verbal Protest Whining Crying Screaming Other: _____

Circle approximate amount of time:

0-5 min 5-10 min 10-15 min 15-20 min 20-25 min 25 min or more

4. During the time in the locker room

Circle Behavior:

Verbal Protest Whining Crying Screaming Other:_____

Circle approximate amount of time:

0-5 min 5-10 min 10-15 min 15-20 min 20-25 min 25 min or more

5. Transition from the locker room to the pool deck

Circle Behavior:

Verbal Protest Whining Crying Screaming Other:_____

Circle approximate amount of time:

0-5 min 5-10 min 10-15 min 15-20 min 20-25 min 25 min or more