Developing and Evaluating the S.A.F.E.R. Near Water Program: An Intervention to Enhance Beliefs Relevant to Supervision and Drowning Risk in Parents With Young Children in Swimming Lessons

By

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ABSTRACT

DEVELOPING AND EVALUATING THE S.A.F.E.R. NEAR WATER PROGRAM: AN INTERVENTION TO ENHANCE BELIEFS RELEVANT TO SUPERVISION AND DROWNING RISK IN PARENTS WITH YOUNG CHILDREN IN SWIMMING LESSONS

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The current study aimed to develop and evaluate the S.A.F.E.R. Near Water program, an evidence-based and theory-driven intervention targeting parent beliefs relevant to keeping children safe around water. Parents with children aged two through five years who were enrolled in lessons at both public and private swim organizations participated. Within each organization, parents were assigned to either an Intervention or Control Condition. All parents completed the same questionnaire measures at the beginning and end of their child’s swim lesson period. Parents in the Intervention Condition participated in the S.A.F.E.R. Near Water program, which comprised in-person educational seminars, informational handouts, and posters reinforcing key safety messages. Results revealed that S.A.F.E.R. Near Water successfully communicated most intended messages and was well received by parents. It significantly improved parental perceptions related to supervision, drowning risk, optimism bias, and water safety. These findings are encouraging for the use of a multifaceted, parent-focused, educational program alongside swim programming to promote closer adult supervision of children around water.
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Burden and Scope of Drowning

Drowning is a significant health threat and a leading cause of death and morbidity for children. Derived from expert consensus at the World Congress on Drowning in 2002, drowning is defined as “the process of experiencing respiratory impairment from submersion/immersion in liquid”, and its consequences are characterized as “death, morbidity, or no morbidity” (van Beeck, Branche, Szpilman, Modell, & Bierens, 2005, pp. 854). According to the World Health Organization (WHO) (2014), for over half of the countries worldwide where valid data were available, drowning ranked as one of the top five causes of death among children aged 1 to 14 years. Alarmingly, young children under the age of five comprise the highest risk group for drowning worldwide (WHO, 2010), with the highest drowning rates being reported in this age group (WHO, 2014, 2017). In the United States, drowning has been identified as the leading cause of unintentional injury death in children between the ages of one and four (National Center for Injury Prevention and Control, Centers for Disease Control and Prevention, 2015). In fact, the WHO (2014) has suggested that given the level of threat posed by drowning worldwide, particularly for children under the age of five, the attention devoted to this problem is lacking and much more is needed.

In Canada, there have been periods of increased drowning fatalities among children under the age of five (Lifesaving Society, 2011; Office of the Chief Coroner for Ontario, 2010). Encouragingly, however, more recent data suggest that child drowning fatalities in Canada are declining (Drowning Prevention Research Centre Canada for the Lifesaving Society, 2016), including for children under five years of age (Drowning Prevention Research Centre for the Lifesaving Society 2016, 2017). In fact, in Canada, between 2009 and 2013, drowning rates were reported to be lowest
amongst the 5 to 14 year-old age group, followed by the under-five age group (Drowning Prevention Research Centre Canada for the Lifesaving Society, 2016). This represents an 8% reduction in the drowning fatality rate for children under five compared to the previous reporting period of 2004 to 2008 (Drowning Prevention Research Centre Canada for the Lifesaving Society, 2016). By way of an explanation, the Lifesaving Society has suggested that this may be due to the positive effects of education delivered to parents of young children aimed at targeting drowning prevention (Drowning Prevention Research Centre Canada for the Lifesaving Society, 2016). Nonetheless, during the 2010 to 2014 period, the provincial drowning rate in Ontario amongst this age group was the same as the national average, 1.1 per 100,000 (Drowning Prevention Research Centre for the Lifesaving Society, 2017). Thus, drowning remains an important injury prevention target across the lifespan for the Canadian population.

Child drownings have been reported to happen after being submerged for one to five minutes (Shields, Pollack-Nelson, & Smith, 2011). However, the drowning process may occur within 30 seconds, and it has been suggested that drownings can occur in as little as 10 (Lifesaving Society, 2008) or 20 (Pia, 1974) seconds. It has also been cited that the drowning experience of a child is often silent (Meyer, Theodorou, & Berg, 2006). Importantly, submersion incidents have been found to occur in water from two inches to four feet deep and Shields and colleagues (2011) noted that water depth is not a discriminating factor for determining whether a drowning outcome will result in death.

Non-fatal drownings (the preferred terminology when referencing incidents resulting in survival; Jones, Moran, & Weber, 2013) where the consequence is morbidity (e.g., disability, brain damage) also pose a significant health risk. The experience of a non-fatal submersion is not uncommon (Moran, 2010a), and children may not be at any advantage compared to adults in terms of brain function/disability despite suggestion that they may be more protected against this based on organic features of their bodies (Suominen et al., 2002). The highest rates of those requiring
hospitalizations (Canadian Red Cross, 2003) and emergency department treatment (Borse et al., 2008) for non-fatal drowning-related injuries have been found amongst children aged four years and under. American data suggest that in 2009, approximately 4,400 children under the age of five received treatment in emergency departments for injuries they sustained around pools and spas (Gipson, 2010); estimates from the 2007 to 2009 period revealed that most of these injuries for this age group occurred in residential locations (Gipson, 2010). Previously existing conditions (e.g., seizure disorders) may exasperate risk (Meyer et al., 2006), but drownings also occur in those considered healthy.

While many non-fatal submersions do not negatively impact neurological functioning (Suominen et al., 2002), they may result in neurological damage (Ross, Elliott, Lam, & Cass, 2003), can damage the brain through hypoxia (i.e., inadequate oxygen) (Wagner, 2009), and even produce a persistent vegetative state (Suominen et al., 2002). The most common outcomes of non-fatal drownings are injuries related to oxygen loss and re-oxygenation of the brain (Meyer et al., 2006). Other outcomes may include shock, lung damage such as acute respiratory distress syndrome (ARDS), or cardiac problems (Meyer et al., 2006). Importantly, how long one is submersed during a drowning incident has been found to be related to whether the consequence is fatal or non-fatal (Suominen et al., 2002). Non-fatal drownings can result in permanent disability and severe brain damage (CDC, 2016; Wintemute, 1990), and those amongst young children under the age of five often result in intensive care treatment and lengthy hospital stays (Ross et al., 2003), which can be stressful experiences for both children and their families. Child drownings, and non-fatal drowning experiences, can have profound effects, including grief, guilt, anxiety, and sleep disturbances amongst parents (Nixon & Pearn, 1977).

Location of Child Drownings

Researchers examining unintentional drowning deaths have found that children aged four years and younger are at particular risk in both urban and rural regions (Borse et al., 2008; Cody, Quraishi, Dastur, & Mickalide, 2004; Petrass, Blitvich,
& Finch, 2011b; Yang, Nong, Li, Feng, & Lo, 2007). Child drownings often occur in familiar areas that may be considered safe by adults (e.g., home environments, places where children frequently spend time). For young children, many drownings occur nearby to the location of one’s home (WHO, 2014). Ross and colleagues (2003) found that most paediatrician-treated, non-fatal drownings that result in hospital admissions have happened at or near the child’s home, with the most common site being swimming pools in private locations. In fact, in Canada, private pools are the most common drowning location for children under the age of five, with 43% of drownings amongst this age group occurring in this location between 2009 and 2013 (Drowning Prevention Research Centre Canada for the Lifesaving Society, 2016). In Ontario, private pools represent the most common non-natural drowning site (Drowning Prevention Research Centre for the Lifesaving Society, 2016, 2017; Office of the Chief Coroner for Ontario, 2010). Specifically, in-ground pools are common locations for submersion related deaths in children (Blum & Shield, 2000; Gipson, 2010). Above-ground, portable (Gipson, 2010), and wading (Shields et al., 2011) pools also pose a risk, particularly for those under the age of five. In fact, American data suggest an increasing trend, from 2007 to 2009, in the number of emergency department treated submersion injuries associated with pools and spas amongst children under five (Gipson, 2010). In this same study, it was found that 70% of all deaths amongst those zero to 14 that were associated with pools or spas occurred in children under the age of five (Gipson, 2010). Therefore, there are a variety of water situations that young children may be exposed to and where drownings commonly occur.

**Activities Associated With Drownings**

In Canada, swimming is the water ‘activity’ during which the greatest number of drownings occur (Drowning Prevention Research Centre Canada for the Lifesaving Society, 2011; Drowning Prevention Research Centre Canada for the Lifesaving Society, 2016), and Ontario has been cited in past research as having the most in total (23 drownings in the year 1999) and fourth highest rate per capita (considering its population size) of drownings occurring during recreational swimming amongst
various areas in Canada (Barss & The Canadian Red Cross Society, 2001). Playing or wading in the water (Canadian Red Cross, 2003) are behaviours that also have been found to be associated with drowning in children. In addition to these in-water activities, falling into the water (Canadian Red Cross, 2003; Yang et al., 2007) has been cited as commonly leading to drowning. Young children aged one to four are at particular risk for drownings resulting from falls into the water, and most fall-related drowning deaths in the home setting amongst this age group occur in home swimming pools (Barss & The Canadian Red Cross Society, 2001). Taken together, swimming, other water based activities, and unexpected events such as falls into the water represent common drowning mechanisms for children. Thus, drowning prevention approaches would do well to target these mechanisms and increase caregivers’ awareness of the drowning risks for young children associated with these.

**Drowning Prevention Approaches**

Many different drowning prevention approaches exist, including: legislative approaches, products manufactured for safety (i.e., Personal Flotation Devices (PFDs), pool and door alarms), preventing access to water (i.e., pool fencing), education about water safety and drowning risk, adult supervision, and swim lessons (Quan, Bennett, & Branche, 2006a). Legislation pertains to fencing around pools, and having fitting and accessible PFDs while boating (Quan et al., 2006a). Pools with four-sided isolation fencing, and self-closing and self-latching gates, can be used to prevent unwanted access of young children to water (Quan et al., 2006a). Pools may also be equipped with alarms that signal when a gate has been opened and when there is movement around the water (Quan et al., 2006a). Interventions that focus on parent and public education about the nature of young children’s drowning risk and what can be done to reduce this risk are also important. In particular, close adult supervision is considered a critical prevention approach for children under the age of five when they are in and around water (WHO, 2014). Learning to swim is also recommended (WHO, 2014), though it is noted that swim lessons should not be viewed as a drowning prevention approach for preschool aged children (Nguyen, Warda, & Canadian Paediatric Society
While any one of these prevention approaches in isolation may be insufficient for protecting children (Committee on Injury, Violence, and Poison Prevention & Weiss, 2010), each is important and related to a comprehensive, multifaceted, and multi-layered approach to drowning prevention. The interventions that are directly related to the current study (pool fencing and pool fencing regulations, adult supervision, swimming lessons, and safety education) will be discussed in greater detail in sections below.

**Preventing Access to Water**

While a wealth of novel drowning prevention products have been created (e.g., alarms and video technology to identify swimmers in danger; PFDs with flags or antennas that can signal one’s whereabouts) (Gunatilaka & Ozanne-Smith, 2006), pool fencing and gating are environmental prevention approaches that have received much attention in the research. Physical barriers to reduce water access/entry are recommended as part of a comprehensive and multi-layered drowning prevention approach (National Drowning Prevention Alliance’s Education Committee, 2009; WHO, 2017). Pool fencing has been found to be protective against fatal and non-fatal drownings in youth, with four-sided isolation fencing recommended (Thompson & Rivara, 1998). In a Canadian study investigating drowning deaths from 1991 to 2000, it was revealed that only 6% of drownings occurring amongst children aged one to four happened in pools with self-closing and self-latching gates (Canadian Red Cross, 2003). Furthermore, in a retrospective study of children aged four years and under who had experienced an unintentional drowning fatality, adherence to barriers was found to be associated with a low proportion of deaths (Bugeja & Franklin, 2013). However, it is not always feasible to implement fences and gates in all water situations, and in areas with natural bodies of water, fencing is indeed rare (Yang et al., 2007). While pool fences are effective when they are used correctly, many pools are not equipped with proper fencing that includes self-closing and self-latching gates (Barss & The Canadian Red Cross Society, 2001; Cody et al., 2004). This has consistently been found to be problematic, as many home pools do not have fencing
that complies with pool fencing standards (Blum & Shield, 2000). Importantly, many pool drownings among young children are associated with a lack of fencing (International Life Saving Federation, 2007), and children may also enter pool areas through improper gating (Blum & Shield, 2000) and when fences are not locked (Cody et al., 2004; Shields et al., 2011) or are left open (Cody et al., 2004). Coffman (1991) cautions that fences should not incite an unrealistic sense of safety. Furthermore, children can climb over fences by using objects to assist them (Shields et al., 2011) and they often engage in risky behaviour (e.g., running, pushing others, unsafe diving) around water that could lead to injury or put them at risk for drowning (Schwebel, Simpson, & Lindsay, 2007b). Given the limitations of passive safety precautions, it seems important to incorporate more active means of protection, and particularly supervision, which is recognized by experts as an important prevention approach for child drownings (Committee on Injury, Violence, and Poison Prevention, 2010; Committee on Injury, Violence, and Poison Prevention & Weiss, 2010; WHO, 2014, 2017).

**Caregiver Supervision**

Inadequate supervision has reliably been found to be a factor associated with child drownings (Bugeja & Franklin, 2013; International Life Saving Federation, 2007; Lifesaving Society, 2008; Petrass et al., 2011b; WHO, 2017; Yang et al., 2007). A Canadian analysis in 2002 revealed that nearly 75% of one to four year olds who died from drowning were unaccompanied by an adult (Canadian Red Cross, 2005), and one conducted more recently found that 65% of children under five who drowned were unsupervised at the time (Drowning Prevention Research Centre Canada for the Lifesaving Society, 2011). According to the Lifesaving Society’s recent report on drowning deaths in Ontario, 92% of drownings amongst children under the age of five were found to occur when supervision was not present or distracted (Drowning Prevention Research Centre for the Lifesaving Society, 2017). Canada wide data for the 2009 to 2013 period demonstrated that 60% of drowning deaths for children aged zero to four occurred when the child was alone, 53% occurred when supervision was
not present, and 40% occurred when supervision was present but distracted (Drowning Prevention Research Centre Canada for the Lifesaving Society, 2016). Drowning deaths in older children aged five to 14 have been found to occur when children are not supervised (Canadian Red Cross, 2003) or when they are with others who are not adults (i.e., those of minority age) (Drowning Prevention Research Centre Canada for the Lifesaving Society, 2016; Drowning Prevention Research Centre for the Lifesaving Society, 2017). In the SOLID (Saving of Children’s Lives from Drowning) project in Bangladesh, it was found that after controlling for a range of demographic variables, children under the age of five who had experienced a drowning fatality were 3.3 times more likely (MOR = 3.3, 95% CI: 1.6 – 7.0) to have been unsupervised (i.e., supervisor not proximal) compared to living matched controls (Khatlani et al., 2017).

Many non-fatal (Ma et al., 2010; Shields et al., 2011) and fatal (Barss & The Canadian Red Cross Society, 2001; Cody et al., 2004; Shields et al., 2011) drownings happen when children and youth are ostensibly being supervised. Ross and colleagues’ (2003) study revealed that young children under five who were treated in hospitals for non-fatal drownings had accessed the pool where their submersion incident occurred along with their parent. This suggests that even if parents are aware of their child entering a water context, they may not be providing adequate supervision in these situations because non-fatal drownings have been found to still occur. An examination of records of child deaths in the United States revealed that 46% of these happened while children were under parent supervision (Cody et al., 2004), and most drowning deaths in swimming pools amongst children aged four and under have been found to transpire when children are being cared for by adults (Blum & Shield, 2000; Bustamante et al., 2007). While it may seem incongruous for drownings to occur while children are under caregiver supervision, supervision practices must be of high quality to effectively protect against drowning (e.g., “touch supervision”, Committee on Injury, Violence, and Poison Prevention & Weiss, 2010, pp. e257). Regrettably, however, supervision behaviours directed toward children are often insufficient.
A recommended, and more comprehensive, approach to measuring supervision is to do so in terms of proximity, attention, and continuity (Saluja et al., 2004), with close (i.e., arms’ length) and constant attention practices being most protective (see Morrongiello, 2005, for extensive discussion). Collectively, this may be referred to as active supervision. There have been studies in the water safety literature that assess supervision along these dimensions (attention, proximity, continuity) (Bugeja & Franklin, 2013; Petrass & Blitvich, 2013). While it is promising that many parents in Moran’s (2010) observational study at beaches provided supervision of children around water that was considered adequate, some (24%) did not and were engaging in various distracting behaviours. Furthermore, despite many caregivers reporting that they would supervise their young child closely while being in the water with them, and even valuing the role of parents or caregivers as supervisors at the beach, some said that they would watch from the shore instead (Moran, 2009). Many caregivers have also been found to not judge their child to be at-risk for drowning (Moran, 2009). In another observational study of children and caregivers in the pool setting, Petrass and Blitvich (2012) found that 30% of children were unsupervised, and 23% were poorly supervised.

Challenges with providing the most protective supervision behaviours are not unique to parents. While pool lifeguards demonstrate appropriate supervision behaviours, there are times when even they may not be constantly supervising (Schwebel et al., 2007b). In an observational study by Petrass and Blitvich (2013), it was found that more children at pools were unsupervised compared to children in the playground context. The authors suggested that this may be related to parental perceptions of the protective function of lifeguards (Petrass & Blitvich, 2013). Lifeguards may be seen as possessing the role of providing both primary and secondary prevention (Ramos et al., 2015), through monitoring and rescue functions, which may impact parents’ judgments regarding the level of supervision that they believe is required of them. However, lifeguard surveillance has been found to not always be appropriate (Michniewicz, Michniewicz, Avramidis, & Patrinos, 2011).
Therefore, if parents are transferring supervision accountability to lifeguards (as Petrass and Blitvich (2013) suggest as a possible explanation for their findings), and, in turn, believing that the level of parental supervision required is less, this can increase children’s drowning risk. It is worth highlighting that close supervision relates to caregivers’ likelihood of intervening when children engage in risky behaviour around water (Petrass & Blitvich, 2012), and importantly, that short lapses in supervision are commonly associated with drownings (Blum & Shield, 2000; Canadian Red Cross, 2003; Coffman, 1991; Drowning Prevention Research Centre Canada for the Lifesaving Society, 2011; Gipson, 2010; Shields et al., 2011).

The level of supervision that parents provide to children around water has been found to vary with age, with closer supervision being provided to younger compared to older children (Petrass & Blitvich, 2012, 2013; Petrass, Blitvich, & Finch, 2011c, d). Specifically, Petrass and colleagues (2011c) found that caregivers report more active supervision practices reflecting being close to their child and having them in view constantly for children aged zero to four than they do for children aged five to nine years; of course, these self-reports may bear little relationship to reality, which is probably why many studies find that supervisors are often present but distracted when young ones drown. They also found that supervision strategies are more frequently single faceted (i.e., watching the child only; being close to the child only) when children got older (Petrass et al., 2011c).

The bidirectional influence of supervision behaviours and children’s risk behaviours around water should also be acknowledged. Schwebel, Lindsay, and Simpson’s (2007a) intervention that successfully improved lifeguards’ monitoring behaviour was associated with decreases in children’s risky behaviour around water. While this program targeted lifeguards (i.e., the ‘supervisors’), the authors suggest that changes in the nature of children’s activities may be related to their perception of being supervised more closely. Extending this result and suggestion to parent-child interactions, if a child considers his/her parent to be more watchful of them around water, she/he may be more likely to follow rules and behave in less risky ways.
consistent with Petrass and Blitvich’s (2012) finding that increased supervision (i.e., better, and more active) was related to children demonstrating fewer risk behaviours around pools.

While the concept of ‘supervision’ and what is considered adequate and appropriate supervision has been a topic of focus in research, there seems to be a lack of convergence in how caregivers define this term. Their conceptions of the level of visual contact and proximal distance required has been found to be variable (Petrass et al., 2011c), a key finding given that how one perceives adequate supervision has important implications for their enactment of this safety practice. Specifically, Petrass and colleagues (2011c) found that while most caregivers seem to value supervision as a child drowning prevention approach, and 75% view the caregiver as being most appropriate to provide this around water, they may also lack clarity about how to define ‘close’ supervision. Few caregivers (23%) regarded being able to see the child in addition to being within arms’ reach as important for denoting close supervision, with the majority believing that having the child in view while being less than five metres away comprised this classification (Petrass et al., 2011c). Parents in this study endorsed the importance of being in close proximity, but being within arms’ reach (Committee on Injury, Violence, and Poison Prevention, 2010) is arguably a more appropriate and responsible practice when children are in or around water. Parents may also abdicate supervision responsibility to siblings, and have been found to be more likely to believe in the acceptability of leaving an infant unsupervised in the bath if they are with an older sibling (Lee & Thompson, 2007). However, this may be considered unsafe, as drownings can occur under child sibling supervision (Cody et al., 2004) and, generally, siblings have been shown not to provide adequate supervision for preventing risk behaviours by young children (Morrongiello, Schell, & Schmidt, 2010; Morrongiello, Schmidt, & Schell, 2010).

**Perceptions of Injury Risk and Supervision**

Many factors can influence the level of supervision provided by parents to children, and parents’ perceptions of injury risk and the value of supervision can play
a role. “Subjective perceptions reflect the interpretation of epidemiologically derived data in personal terms. The subjective assessment of the probability of an undesirable event and its seriousness can be called perceived risk” (Michaelsen, 2006, pp. 95). Parents are unlikely to closely supervise children and enact other safety behaviours if they do not view injuries as posing a risk to children. It is troubling that many parents hold misguided beliefs about injuries and drowning that could potentially elevate their children’s risk, and that they may not always have adequate knowledge in these areas.

While the majority of parents believe that child injuries can be prevented (Vincenten, Sector, Rogmans, & Bouters, 2005), some see injuries as simply a consequence of children’s play (SAGE Research Corporation for Family and Child Health Unit, Health Canada, 1996), do not worry much about injuries, and view the likelihood of injury occurrence as low (Morrongiello & Dayler, 1996; Peterson, Farmer, & Kashani, 1990). A study of parents with children under the age of five across 14 countries in Europe investigated whether parents’ concerns regarding different mechanisms of injury reflected the actual causes of death to children (Vincenten et al., 2005). Although many parents were appropriately concerned about car-related injuries, which accurately reflects data that road-traffic incidents are the number one cause of child injuries, only seven percent of parents reported drownings as something they were highly concerned about (Vincenten et al., 2005) even though children under five comprise the highest risk group for drowning worldwide (WHO, 2017). Some parents do not see children aged one to four as an age group susceptible to drowning (Rahman, Shafinaz, Linnan, & Rahman, 2008), and a study conducted throughout the United States found that 55% of parents have little worry about their child’s vulnerability for drowning (Cody et al., 2004). Parents have further been shown to hold mistaken views about where young children drown, with many believing that natural water is riskier for young children than pools (Moran & Stanley, 2006a). This is not the case for toddlers.
Perceptions of drowning risk and prevention may also vary depending on cultural group. A study of Vietnamese parents residing in Washington, USA, found that many had misconceptions about the causes and mechanism of child drownings, and all of them believed that drownings occurred because of fate (Quan, Crispin, Bennett, & Gomez, 2006b). Similarly, parents in Bangladesh may not value drowning prevention because of the view that drownings happen as a result of fate (Rahman et al., 2008). Therefore, it is important to consider cultural factors to be able to more fully understand the context in which parents’ risk beliefs exist.

Parents may also hold risky views about the age at which children can be left alone around water. Lee and Thompson (2007) found that while most (87%) parents believed that infants between six and 12 months should never be left unattended in the bath, some reported thinking that it is acceptable to leave them alone for under 30 seconds or one minute. Parents have also been shown to view 6.7 years as an acceptable age for a child to take a bath without direct adult supervision (Porter et al., 2007). Arguably, it is not acceptable to leave a young child, particularly an infant, alone around water even for even a few seconds because of how quickly drowning can happen (Lifesaving Society, 2008; Pia, 1974).

Research also demonstrates that while parents of young children often believe that they are knowledgeable about injury risk, they have also been shown to lack knowledge about the scope and burden of child injuries (Morrongiello & Dayler, 1996; SAGE Research Corporation for Family and Child Health Unit, Health Canada, 1996). While having inaccurate knowledge about topics related to water safety is not uncommon, this could have adverse effects on children’s drowning risk. Though some parents correctly believe that a child could drown in less than 30 seconds (35%), it is concerning that others think that the time frame for this to happen is less than one (33%) or even five (20%) minutes (Lee & Thompson, 2007). Importantly, incorrect knowledge about the time it takes for a child to drown could impact parents’ supervision such that they may leave a child alone for longer if they think that drowning is not a threat for the length of time that they are away. A lack of correct
knowledge regarding hypothermia has been reported, with most people underestimating the time it takes for this to develop (Giesbrecht & Pretorius, 2007). As Giesbrecht and Pretorius (2007) point out, this underestimation has important implications related to the time available for rescue, and inaccurate beliefs may increase risk and decrease a child’s chance of survival.

Parents have also been found to hold mistaken beliefs about their own safety knowledge. Moran and Stanley’s (2011) study revealed that of parents who endorsed awareness of CPR guidelines for children, only 30% recalled this information correctly. Even swim instructors have been found to have some difficulties accurately remembering CPR information even though many report that they know how to do this (Blitvich, Moran, Petrass, McElroy, & Stanley, 2012). Furthermore, even if parents do possess knowledge regarding drowning prevention, they do not always enact these approaches (Rahman et al., 2008).

Relatedly, there is often a disconnect between how parents believe they are supervising and their actual supervisory behaviours. Cody and colleagues (2004) discovered that while 94% of parents endorsed active supervision of their child during swimming activities, they also reported that they engage in behaviours that detract from their ability to deliver high quality and active supervision. Being risk-aware, on the other hand, may have positive effects on safety behaviours, and there has been a suggestion that caregivers may adjust their supervision practices and do so more closely in water situations perceived as risky (Petrass et al., 2011c). Parents’ difficulty translating their well-intentioned protective beliefs into effective safety practices may be a function of perceived barriers to being able to do so. Vincenten and colleagues (2005) found that parents acknowledge often not having adequate knowledge to be able to secure their child’s safety, and that the most frequently identified barrier to keeping their child safe was that parents are not able to provide full and constant supervision. Similarly, some parents view constant supervision of young children generally (SAGE Research Corporation for Family and Child Health Unit, Health Canada, 1996) and in the water context (Moran & Stanley, 2006a) as something that
they cannot achieve. Believing in the value of a prevention approach and seeing this as within their capabilities to enact, however, can impact parents’ safety behaviours in a positive way. In their study of those who own pools, Fisher and Balanda (1997) discovered that perceptions regarding the protective value of pool fencing were related to the quality of fencing that was implemented. Therefore, it seems essential to encourage parents to see the value in close supervision, and help them overcome obstacles they may face, to assist them to feel more capable of effectively supervising.

**Swimming Competency and Swimming Lessons**

In addition to parents’ perceptions of injury risk and supervision, how they perceive their child’s ability to manage their own risk around water has important implications for safety related beliefs and supervisory behaviours. Topics that have received increased attention in recent literature relate to the impact of children’s swimming skills and participation in formal swimming lessons upon drowning risk, as well as upon parents’ beliefs relevant to risk and supervision.

There is some work highlighting the potential for toddler swim lessons to be protective against drowning. Notably, a matched case-control study by Brenner and colleagues (2009) found that toddlers aged one to four who had died from unintentional drownings (excluding those occurring in ice water, bathtubs, and buckets) were less proficient swimmers, and not as likely to have taken part in formal swimming lessons. Furthermore, their analyses revealed that taking part in swimming lessons translated into 88% less risk for drowning amongst this age group (Brenner et al., 2009). Convergent results were found in a rural, Chinese study discovering that for young children aged one to four, not having participated in swimming lessons was significantly related to drowning deaths, most of which occurred in natural water areas (i.e., ponds), and none having happened in pools (Yang et al., 2007). Findings from a systematic review by Wallis and colleagues (2015) suggested that swimming lessons can increase swim skill in children aged two to four years, and are not associated with elevating children’s drowning risk.
Further evidence converges on the notion that swimming skills can confer a protective function against drowning for young children. A national study conducted in the United States reviewing childhood unintentional drowning deaths revealed that 74% of those to children under 14, and 100% of those to children under four, were amongst individuals who were unable to swim (Cody et al., 2004). Similarly, an examination by the Lifesaving Society (2008) of deaths from drowning in Ontario from 1987 to 2004 discovered that 92% of cases of children under five were not able to swim, and a study by the Canadian Red Cross (2003) revealed that 32% of deaths to children aged five to 14 were amongst those who were unable to swim or considered to have weak swim skill. A report from the Office of the Chief Coroner for Ontario (2010) found that 40% of drowning victims could not swim, which is consistent with most recent Ontario suggesting that 45% of drowning deaths were amongst those who could not swim (Drowning Prevention Research Centre for the Lifesaving Society, 2017). Furthermore, in Canada, between 2009 and 2013, 45% of deaths were in those unable to swim or considered to have weak swim skill (Drowning Prevention Research Centre Canada for the Lifesaving Society, 2016).

Other questions related to the relative risks and benefits of swimming lessons for young children have been explored. A small-scale study in Iceland offers suggestion that participating in swim lessons as an infant might confer some motor benefits in children when they reach age four, though several methodological limitations are noted (Sigmundsson & Hopkins, 2009) and caution should be taken in interpreting these results. Participating in swimming lessons also has been found to be related to children’s swim ability (Laosee, Gilchrist, Khiewyoo, Somrongthong, & Sitthi-amorn, 2011; Morrongiello, Sandomierski, Schwebel, & Hagel, 2013a), a desired effect and likely a key reason for parents to register their child in lessons. Parents with children enrolled in swimming lessons (Moran & Stanley, 2006a; Morrongiello et al., 2013a), and also swim instructors (Blitvich et al., 2012), do value beginning lessons in the early toddler years, though it is noted that starting lessons at an early age does not
necessarily mean that children will acquire skills more quickly than those who start later (Parker & Blanksby, 1997).

The age at which children ‘should’ learn to swim is a key topic that has received much consideration (e.g., Brenner, Saluja, & Smith, 2003). A statement issued by the American Academy of Pediatrics (AAP) in 2000 suggested that, based on evidence at the time, children were “generally not developmentally ready for formal swimming lessons until after their fourth birthday” (Committee on Sports Medicine and Fitness and Committee on Injury and Poison Prevention, 2000, pp. 869). However, in 2010 the AAP’s stance was revoked and they no longer specify a minimum age, stating: “the evidence no longer supports an advisory against early aquatic experience and swimming lessons for children of any specific age. However, the current evidence is insufficient to support a recommendation that all 1- to 4-year-old children receive swimming lessons” (Committee on Injury, Violence, and Poison Prevention, 2010, pp. 179). The general consensus amongst American (Committee on Injury, Violence, and Poison Prevention, 2010) and Canadian (Nguyen et al., 2003) pediatric groups appears to generally support swim lesson programs for most children over the age of four, but does not recommend against such programs for children under age four. These organizations acknowledge that developmental factors need to be considered when judging children’s aquatic readiness. Considering drowning on a global scale, it is also worth noting that the WHO (2017) recommends learning to swim for children over the age of six, once they have been assessed to ensure an absence of conditions that could potentially relate to higher drowning risk (e.g., medical difficulties).

Furthermore, the American Red Cross Advisory Council on First Aid, Aquatics, Safety, and Prevention (ACFASP) recommends, based on an extensive literature review, that “infants and young children may optionally start swim lessons for the purpose of building aquatic readiness and water acclimation on an individual basis any time after the first or second year of life” (Langendorfer et al., 2009, pp. 470). The ACFASP emphasizes that lessons for these toddlers are not to reinforce ‘swimming’ per se, but more for water comfort. Similarly, the Canadian Paediatric
Society (CPS) aptly suggests for young children’s lessons to concentrate on promoting children’s confidence in the water and on parental water safety education, rather than being considered a way to prevent drowning (Nguyen et al., 2003). Given the paucity of empirical evidence on what age is best for children to start swim lessons, the ACFASP, like the AAP and CPS, does not advocate for a specific age, nor does it suggest that children should not learn to swimming skills at very young ages (Langendorfer et al., 2009).

An area of considerable discussion in the literature relates to what comprises ‘swimming’, and its association with reducing drowning risk. While the work reviewed above indicating a protective function of swimming lessons is encouraging, it is important to reflect on what children at the preschool ages are learning in lessons, and how this relates to their capacity to keep themselves safe. It is also critical to consider how parents view the role of swimming lessons in preventing drowning for children under five, their understanding of swimming, and how this impacts parental views about children’s drowning risk and supervision needs.

**Conceptualizing ‘Swimming’ and ‘Swimming Competence’**

How parents perceive their child’s experience in swimming lessons may be complicated by the fact that an agreed upon definition of *swimming ability* does not exist (Brenner, Moran, Stallman, Gilchrist, & McVan, 2006). A study amongst Canadians found that 37% judged those who could swim 50 metres as ‘good’ at swimming, but some also thought that swimming 25 or even 10 metres would justify this classification (Ipsos Reid, 2012). People’s conceptions of swimming often omit aspects of safety and drowning prevention (Dixon & Bixler, 2007), an arguably critical factor in defining this term. A study by Dixon and Bixler (2007) that asked adults explicit and straightforward questions about how they define swimming found that respondents’ definitions were quite variable, and only 4% of people mentioned safety.

It has been suggested that rather than using the term ‘swimming ability’, a more appropriate and multifaceted concept is water competence and the ways in which this relates to drowning prevention (Brenner et al., 2006). Langendorfer (2011)
views ‘ability’ as having a static connotation, and advocates for the terms ‘competence’ or ‘skill’ instead, which are viewed as more ‘dynamic’. Stallman, Junge, and Blixt (2008) propose that the approach to swimming should take into account the causes of drowning, and that lessons should be taught according to these causes while building upon knowledge and beliefs about water safety, instead of focusing exclusively on swim strokes and movement in the water. Water competence includes the multitude of motor, cognitive, and affective factors that impact a person’s attitude and approach to being in and around water (Brenner et al., 2006). Cognitive factors may include hazard knowledge, judgment, and beliefs, and having an accurate sense regarding what one is capable of is deemed critical as well (Stallman, 2011c).

Stallman and colleagues (2008) also advocate for a developmental approach to swimming, which is important to consider in the context of exploring toddler lessons. Furthermore, Stallman and colleagues (2008) suggest a ‘zone’ of achievement when judging whether one is able to swim, instead of dichotomous distinctions, a notion that is not unfamiliar to characterizing skill level in other sports. In the research literature, multifaceted, continuous, and developmental approaches to measuring swimming skills that mirror what is actually taught to young children in lessons have been developed (Morrongiello et al., 2013a). Some authors have also attempted to broaden their scope when measuring competency to include skills related to safety and prevention of drowning (Moran, 2017; Moran et al., 2012a). Such methods are arguably more comprehensive than using distance as a benchmark for swimming related skills, like some studies have done (i.e., McCool, Moran, Ameratunga, & Robinson, 2008; Moran, 2006). Dichotomous categories created based on the distance one can swim lack measurement specificity, and as Petrass, Blitvich, McElroy, Harvey, and Moran (2012) point out, universally accepted taxonomies for judging competence in swimming based on distance do not exist. As reviewed in Stanley and Moran (2017), length based indicators of water competence are often capricious, with differing parameters for swim programs worldwide.
Importantly, parents may demonstrate optimistic beliefs regarding the required distance to confer a protective function against drowning, and be vulnerable to developing a false sense of safety in this (Stanley & Moran, 2017). For example, if parents judged their child as being able to achieve a swim distance of more than 25 metres, they demonstrated a greater likelihood of endorsing the belief that their child was safe near water, compared to parents of children who judged their child as being capable of swimming 25 metres or less (Stanley & Moran, 2017). This is a potentially concerning finding given that many of these children had not had swimming experience in open water (Stanley & Moran, 2017). While experts in the field have been striving for definitional changes, people’s perceptions related to whether one ‘can swim’ may not always be consistent with a definition of water competency that privileges the skills considered necessary for survival (Lifesaving Society, 2016; Quan et al., 2015). This has important developmental implications for the safety of preschool aged children around water.

**Impact of Swim Competence and Water Experiences**

There has been contention that swimming lessons for young children could incite them to have an inflated sense of confidence around water (Smith, 1995), and those with superior swimming skill may engage in riskier aquatic behaviours (Ma et al., 2010). Consistent with the possibility of overconfidence developing, results from a study of those at beaches found that lower risk judgments about a variety of water-related scenarios were related to respondents’ ratings themselves as possessing more swimming competence (McCool et al., 2008). Another related concern is the development of *inflated swimming self-efficacy*, characterized by high levels of self efficacy for swimming and low levels of swim skills (Dixon & Bixler, 2007). While the evidence is mixed regarding whether increased (Laosee et al., 2011) or reduced (Ma et al., 2010) swim skill in youth is related to the experience of non-fatal drowning incidents, these events may impact one’s subsequent attitudes towards water.

Non-fatal submersions can have the effect of encouraging a more careful approach to water in some young people, but the majority (66%) may still demonstrate
confidence afterwards about engaging in activities in the water (Moran, 2010a). It is possible that a similar process could occur in toddlers who have had such experiences too, particularly because of developmental vulnerabilities such as their immature memory capacity, sense of danger, and ability to follow rules. In contrast, there is some evidence amongst parents that having personal experience with someone who has suffered a non-fatal drowning may sensitize them to risk (Morrongiello et al., 2013a), and similar results have been found in parents whose children have had other injury experiences as well (Glik, Kronenfeld, & Jackson, 1991; Morrongiello, Howard, Rothman, & Sandomierski, 2009a). While injury events may impact children and parents in different ways, these results highlight that parents may become more risk aware following exposure to these.

**Swimming Lessons and Supervision**

There is some evidence lending support for an association between risk awareness and exposure to children’s swim experiences. For example, swim instructors have been shown to be mindful that increased water comfort does not translate into the preclusion of close supervision, with over 67% endorsing the statement that “increased toddler confidence after swim lessons requires greater adult supervision” (Blitvich et al., 2012, pp. 116). Additionally, a study of Canadian parents’ views about backyard pool safety revealed that 70% expressed some level of worry about children in this setting despite them being able to swim (Ipsos Reid, 2012). However, increased swim skill and swim lesson experience may also be associated with parents developing a false sense of security in their child’s ability to keep himself/herself safe around water, which, in turn, can affect their supervision beliefs and practices.

Specifically, evidence exists that parents may overvalue the protective role of swimming lessons in ways that could increase children’s risk for drowning. Moran and Stanley’s (2006a) study revealed that some parents with two to four year olds believed that not having participated in swimming lessons was a reason why children drown, and that swimming lessons are a better prevention strategy than adult
supervision. A study exploring beliefs about water safety and drowning risk found that many American parents view supervision as not necessary if children have had years of swim lesson experience or if they were judged to be an ‘excellent’ swimmer (Cody et al., 2004), and 40% of Canadian parents thought that children could be left near pools without supervision if they were able to swim (Ipsos Reid, 2012). Some swim instructors (50%) have also been found to view swimming lessons as the preferred drowning prevention approach for toddlers, and over 30% endorsed toddler swimming skill as being more effective than adult supervision in preventing drowning (Blitvich et al., 2012).

In addition, the level of supervision that caregivers provide may relate to children’s swimming skills. Petras and Blitvich’s (2012) study demonstrated more active supervision towards children who could not swim (a designation based on an observer’s rating), and those who were considered adept swimmers were more likely to be unsupervised. These results are worrisome because swimming lessons and being able to swim should not be a replacement for close supervision, though they may be treated as such to some extent by parents. In a retrospective study examining the level of supervision reported amongst children aged four and under who experienced a drowning fatality, results found that the level of supervision provided was more amongst children who had formal swimming lesson experience (Bugeja & Franklin, 2013). While this result may seem counter to those reviewed above, it is important to note the study limitations in applying a definition of supervision retrospectively. In addition, there were many variables not known, which would have elucidated greater understanding of this finding (e.g., parent, child, circumstantial factors). Specifically, perceptions related to the potential ways in which children’s participation in swim lessons may have impacted supervision practices was not known in this study, an area that has been explored in past research (Moran & Stanley, 2006a; Morrongiello et al., 2013a; Morrongiello, Sandomierski, & Spence, 2013b), and that is important to understanding more about the relation between the role of swim lessons, risk perceptions, and supervision.
Moran, Quan, Franklin, and Bennett (2011) examined the research literature supporting drowning prevention messages generated by the International Task Force on Open Water Drowning Prevention (ITFDP). While messaging about the importance of active supervision was well supported, this was also ranked to be lower in priority than messages focusing on teaching swimming and water safety skills, swimming in lifeguard protected areas, and establishing rules about water safety (Moran et al., 2011). It is noted by authors that the ITFDP’s messaging guidelines advocate for a broader view of supervision that considers attention to the environment and various safety practices (Quan, Bennett, Moran, & Bierens, 2012), a position consistent with a comprehensive and multi-layered view of drowning prevention, but this also invites questions about the priority of messages targeting young children’s water safety. Prevention messaging that communicates to parents with toddlers about relinquishing responsibility to children, or appealing to environmental factors, may risk the unintended effect of potentially reinforcing an overvaluing of the role of swimming skills and lessons. Young children have limited ability to understand the dangerous consequences around water and rely on their parents for safety, particularly in the toddler years.

Importantly, parents with children in swimming lessons may be vulnerable to developing optimistically biased beliefs that lessons protect children from drowning. This is troubling given that there has shown to be a greater likelihood of adopting health behaviours amongst those with more realistic risk perceptions than in those who are optimistically biased (Kreuter & Strecher, 1995). Compared to parents with young children not participating in swimming lessons, those whose children were in lessons have been shown to possess more risky views about water safety; more of these parents also endorsed swim lessons as the most favourable toddler drowning prevention approach in addition to thinking that toddlers can secure their own safety from a fall into the water (Moran & Stanley, 2006a). Unpublished data converge on the notion of parents with young children in swim lessons developing overconfidence in children’s water competence. Langendorfer (2011) found that after 10 swim lessons,
parents were shown to believe that their child’s safety around water had improved, while observational methods demonstrated that the child’s swim skill had not changed. In a longitudinal study amongst parents with two to five year-olds in swimming lessons, Morrongiello and colleagues (2013b) found that as children progressed through lessons and their parents judged that they were improving in swim skills, parents increasingly believed that children were capable of keeping themselves safe from drowning, and, as a result, that their need for close supervision was less. However, not only are people often not accurate judges of their own swim ability (Petrass et al., 2012) and have trouble making these judgments (Ipsos Reid, 2012), there have been shown to be limitations in the accuracy of parental perceptions of their child’s swim skills (Morrongiello et al., 2013a). These inaccuracies may misinform and obscure decisions that parents make about how to supervise their children around water.

At the toddler age, it is arguably unreasonable to assume that children will be able to secure their own safety around water. The AAP does recommend that children should learn to swim (Committee on Injury, Violence, and Poison Prevention & Weiss, 2010), but it has been consistently cited that swim lessons should not be viewed as a “drown-proof” method for children (Coffman, 1991; Committee on Injury, Violence, and Poison Prevention, 2010; Meyer et al., 2006; National Drowning Prevention Alliance’s Education Committee, 2009). The importance of considering a child’s capacity to perform aquatic skills that would be necessary for the prevention of drowning has also been highlighted (Committee on Injury, Violence, and Poison Prevention & Weiss, 2010). Expert sources caution the public against information available on the Internet that could lead people to think that young children are able to keep themselves safe from drowning, advocating instead for the critical role of constant adult supervision (Canadian Red Cross, 2007). One example of this is a video that appears to demonstrate an infant performing self-rescue skills. While this has attracted public interest and attention, experts maintain that there is no research support (Committee on Injury, Violence, and Poison Prevention, 2010; Langendorfer,
2015) for the claims in the video. Importantly, in his editorial, Langendorfer (2015) writes that the video “obscures other, more important and well-established drowning prevention factors and principles. First, the video features an unsupervised child. Principle #1 in child drowning prevention is always, always maintain constant supervision of children despite the challenges required to do so” (pp. 2).

Research studies with similar submissions about children’s capacity to maintain safety on their own should also be interpreted carefully. Asher, Rivara, Felix, Vance, and Dunne’s (1995) study examined the longitudinal effects of an intervention program on children’s safety and swim skills. Safety around water was assessed using observational measures of children’s behaviour on the pool deck, their capacity for recovery after being released into the water, and whether they could jump into the pool and return to the edge by swimming. Asher and colleagues’ (1995) results suggested that children as young as 24 to 42 months may be able to acquire some water skills that could confer a protective function against drowning. While the water recovery manipulation used in this study served to indirectly capture the ability to endure a fall, the authors note that their training did not result in safer pool deck practices from the beginning to end of their programme (Asher et al., 1995), which would be important given that falling into the water is a leading mechanism of drownings for toddlers. Furthermore, the study conditions may not represent the true circumstances of child drownings, such as unexpected falls that often occur when children are clothed and may be in a frightened and disoriented state (it should be noted that the authors do mention the limitations of using a contrived task).

The importance of considering the causes of drowning (Stallman et al., 2008) and developmental factors (Langendorfer et al., 2009; Stallman et al., 2008) with regard to swimming lessons has been consistently noted, and the Lifesaving Society’s Swim to Survive program builds on these ideas. In Ontario, this program is available during school hours at no cost for grade three students, and is free in many other provinces as well (Lifesaving Society, 2011). The Swim to Survive Teacher’s Kit, provided to the author upon request, contains information about the program background and its
components. The Swim to Survive Program is funded by the Ontario Ministry of Education. It is not intended as a substitute to swimming lessons, but aims to teach children what are believed to be the minimally necessary skills required to “survive an unexpected fall into deep water”. Children learn to perform the following three skills in sequence: rolling into deep water, treading water for one minute, and swimming 50 metres. Given their developmental stage, and limited motor coordination and cognitive capacity, it seems unlikely that two to five year-old children, regardless of whether they are in swimming lessons, would be able to perform these three skills. This could be an important point to emphasize for parents who think that children at these ages can protect themselves from drowning.

**Summary About Parent Beliefs**

Collectively, the literature suggests that many parents possess maladaptive beliefs about drowning risk and supervision, and parents with children in swimming lessons may be particularly vulnerable to developing a false sense of security and optimism bias in the protective role of lessons for young children. On account of these findings, it seems paramount to target parents’ beliefs and knowledge in these areas in order to promote the safety of young children around water. Encouragingly, there have been many successful initiatives and programs with this goal.

**Intervention Programming**

*Role of Education in Intervention Programming*

While the need for multifaceted approaches to injury prevention that include more than just education has been noted (Dowswell, Towner, Simpson, & Jarvis, 1996), education is recognized as an important component of a comprehensive approach that can be useful to target beliefs and attitudes about an injury topic (Gielen, 1992). Parent education has been specifically noted as an imperative component in efforts to prevent drowning (Coffman, 1991), and is part of a multilayered approach to prevention. Water safety education materials delivered as part of controlled research studies may be particularly important given that while information on this topic is widely available on the Internet, it is often of limited quality (Chesser et al., 2011; Isaac, Cusimano,
Sherman, & Chipman, 2004). Furthermore, online safety information related to child drowning prevention may focus more on approaches related to environmental factors than active supervision (Chesser et al., 2011), and news coverage about drownings, another unrestricted source of information, may lack messaging about drowning prevention, water safety, and supervision (Chesser, Ahlers-Schmidt, & Synovitz, 2009).

Notably, education is valued by the public as an approach for injury prevention (Girasek & Gielen, 2003), and water safety education programs can enhance children’s safety behaviour around water, knowledge about water safety, as well as parents’ beliefs regarding water safety (Pearson et al., 2012). Over 400,000 Canadian children are reported to have taken part in the Swim to Survive program (Lifesaving Society, 2011), which, in addition to teaching children water skills necessary for surviving a fall into the water, consists of three educational lessons about water safety and provides parents with information about the program (Swim to Survive Teacher’s Kit). Purnell and McNoe’s (2008) systematic review identified several water safety educational programs (i.e., Swim to Survive, Swim for Life, and Water Smart) that Canada offers at the national level, and it has even been suggested by the Lifesaving Society (2008) that the decline in drowning deaths in both Ontario and nationally after 1987 may be related to their implementation of the Water Smart education initiative. Water safety and drowning prevention campaigns have been consistently delivered with favourable results at the community level (Bennett et al., 2006; Bennett, Cummings, Quan, & Lewis, 1999), including education campaigns containing messaging about supervision [i.e., SafeWaters (Haddrill & Mitchell, 2006); Stay on Top of It (Bennett et al., 1999)].

**Programming Taking Place Alongside Children’s Swimming Lessons**

A systematic review by Kendrick, Barlow, Hampshire, Stewart-Brown, and Polnay (2008) demonstrated that parenting interventions that are implemented in the context of programs with multiple components can decrease child unintentional injury. While parents may have some difficulty remembering water safety related information they receive in clinical settings (Lee & Thomson, 2007; Powell, Tanz,
Uyeda, Gaffney, & Sheehan, 2000; Quan, Bennett, Cummings, Henderson, & Del Beccaro, 2001, swimming lessons can be an effective medium to distribute water safety messaging (Tate, 2006) and may also present a unique opportunity to offer targeted information about drowning. Moran and Stanley (2006b) found that a ten-week parent-focused education program taking place along with their child’s swim lessons successfully targeted parents’ tendency to overvalue the protective function of lessons, and other risky beliefs that had been identified in their earlier study amongst parents with two to four year-old children in swim lessons (Moran & Stanley, 2006a). Specifically, their program resulted in reductions in the percent of parents who judged safety to be the central outcome of swim lessons as well as the chief reason for enrolling children in lessons (Moran & Stanley, 2006b). Parents may have also begun to realize that at these young ages, swimming lessons may be less about swim skills per se than about children becoming comfortable in the water, as more parents judged that water confidence and water enjoyment were key reasons for registering their child in lessons after the program compared to at the beginning of lessons (Moran & Stanley, 2006b). After participation in the program, parents demonstrated improved knowledge of the circumstances surrounding drownings (Moran & Stanley, 2006b). Furthermore, the program was also associated with improvements in parent beliefs regarding the value of supervision as a prevention approach (Moran & Stanley, 2006b). Moran, Stanley, and Rutherford’s (2012b) parent-focused CPR education program taking place at a swim school while children under five were in lessons was effective in increasing some aspects of parents’ CPR knowledge. Furthermore, following participation in an on-site, video-based CPR program, parents with children in swimming lessons were shown to demonstrate increased knowledge of CPR skills and confidence in their ability to perform CPR, with many of these gains persisting up to one month after program involvement (McCarrison, Ren, Woomer, & Cassidy, 2017). These results highlight that parent programs taking place in combination with children’s swimming
lessons are both feasible and can be effective in targeting parents’ safety beliefs and knowledge.

**Targeting Parent Beliefs Effectively**

**Role of Health Behaviour Theories**

Health behaviour change theories privilege the need to understand knowledge and beliefs, which are key factors to consider when targeting educational efforts towards a health topic (Michaelsen, 2006). In Weinstein’s (1993) review and comparison of several health behaviour theories including the Health Belief Model (HBM), Theory of Reasoned Action, and Protection Motivation Theory, he notes that “researchers typically select one theory to test or to guide their choice of exploratory variables as if the other theories did not exist” (pp. 324). Weinstein (1993) argues instead that “the real goal, however, should not be to decide which theory is best, but to decide which variables and processes in these theories improve our understanding of health-protective behaviour” (pp. 331 – 332). This encourages a similarly critical perspective toward the application of theory to creating intervention programs. Education and messaging that targets constructs from competing health behaviour theories, while integrating these in a meaningful way, allows for a comprehensive approach to intervention.

The HBM contains many relevant constructs that may be applied to designing intervention programs aimed at affecting changes in health beliefs and behaviours. The HBM postulates that the likelihood of adopting health behaviour is influenced by perceptions of susceptibility, severity, benefits, barriers, and cues to action (as reviewed in Janz & Becker, 1984). It also has been suggested that the addition of self-efficacy to the HBM may be particularly valuable in conceptualizing the factors that impact behaviours (Rosenstock, Strecher, & Becker, 1988). Importantly, it is noted that a cue to action could be some kind of educational message or even the experience of someone else that activates a response (Janz & Becker, 1984). Research supports associations between constructs in the HBM and a wide range of health behaviours (Janz & Becker, 1984), and this model has been successfully applied in past injury
research as a framework for predicting parents’ health behaviour from their beliefs (Peterson et al., 1990). Furthermore, water safety related intervention materials drawing on key aspects of the HBM have been shown to result in long-lasting changes in parents’ perceptions related to susceptibility, severity, and perceived benefits (Girasek, 2011), and to improve lifeguards’ monitoring behaviours (Schwebel et al., 2007a).

The Theory of Planned Behaviour (TPB) is a model used to predict behaviour from both intentions and beliefs about that behaviour. It denotes some important constructs, and Ajzen (1991) outlines that attitude toward a behaviour, subjective norm (i.e., “perceived social pressure to perform or not to perform the behaviour”, pp. 188), and perceived behavioural control (i.e., “perceived ease or difficulty of performing the behaviour”, pp. 188) all relate to intention to perform a behaviour. Behavioural intentions and perceived behavioural control then, in turn, influence behaviour in the TPB. The emphasis on behavioural intentions and their role in predicting behaviour is relevant to the current study where it is not feasible to measure actual supervision behaviours, but where intentions will instead be measured. There is ample support in the literature supporting the theory’s key tenets (e.g., Ajzen, 1991; Armitage & Conner, 2001).

The Protection Motivation Theory (PMT) is a model used to understand how cognitions can predict health-related behaviour (e.g., whether someone will enact preventive measures). The theory postulates that motivation to act (in protective ways) is influenced by one’s appraisals of both threat (which is influenced by potential rewards of a health behaviour, as well as perceptions of severity, vulnerability, and threat) and coping (which is influenced by beliefs about the effectiveness of a health behaviour, one’s ability to enact it, and perceived costs) (see Floyd, Prentice-Dunn, & Rogers, 2000 for meta-analytic review). Application of the PMT to water safety initiatives also offers some promise (Bennett et al., 1999), and in McCool, Ameratunga, Moran, and Robinson’s (2009) study, the construct of response efficacy from this theory (i.e., in this case the belief that engaging in safe swim behaviours will be
effective in preventing drowning) was related to safe swimming (abstaining from alcohol and adherence to swimming within the permitted boundaries).

Applying these theoretical constructs to the water context, one can conclude that for parents to intend (behavioural intentions), and eventually to enact close supervision behaviours of their child around water (behaviour), they must: see their child at risk for drowning (perceptions of susceptibility, severity), see value in this protective behaviour (perceived benefits), believe that it will reduce children’s health risk (response-efficacy), feel capable in their ability to enact this (self-efficacy), see this behaviour as being accepted and supported by others whose opinions are important to them (subjective norms), and also believe that it is achievable (behavioural control, perceived barriers) without coming at too great a cost to them (perceived costs). These important theoretical constructs were considered when creating the intervention materials used in the current study (to be elaborated upon in sections below). In addition to drawing on a theoretical foundation to inform intervention targets, the research literature was also explored. This aimed to determine how messaging would best be directed at these targets, and to explore other potential targets to complement the ones suggested by theory.

**Messaging and Risk Communication**

*Fear Appeals and Self-Efficacy*

It has been suggested that messaging to communicate risk “must simultaneously inform, persuade, arouse alarm, evoke high emotion, create feelings of vulnerability, and instill in parents a high sense of efficacy for protecting their children” (Will, 2005, pp. 953). Messaging combining fear appeals with that which promotes high levels of self-efficacy is important (Will, 2005; Will, Dunaway, Kokorelis, Sabo, & Lorek Jr., 2012; Witte & Allen, 2000), and video-based, safety related interventions that do this can successfully target parents’ knowledge and self-efficacy beliefs (Morrongiello, Sandomierski, Zdzieborski, & McCollam, 2012a; Will, Sabo, & Porter, 2009), behavioural intentions (Will et al., 2009) and even supervision behaviours of young children (Morrongiello, Zdzieborski, Sandomierski, & Munroe,
Drowning messaging applying a fear appeals approach has been shown to be more effective than using a celebrity swimmer in promoting recall of water safety messaging (Tate, 2006). Printed materials, such as posters applying a fear appeals approach (Will & Geller, 2004), that build up beliefs about threat and self-efficacy by providing information about how to improve safety practices have also been suggested as a way to communicate about safety.

Witte and Allen’s (2000) meta-analysis examined how differing levels of fear and efficacy in health messages were related to changes in perceptions and behaviours. Their results revealed that higher fear appeals were related to increased perceptions of fear, severity, and susceptibility, and high efficacy messages were associated with greater beliefs of both self and response efficacy (Witte & Allen, 2000). Furthermore, messages high in evoking fear, severity and susceptibility, as well as self- and response-efficacy, were related to increases not only in perceptions, but also to intentions towards a behaviour and actual behaviour (Witte & Allen, 2000).

Witte and Allen (2000) provide several recommendations for applying fear appeals to health messaging, and suggest targeting severity, vulnerability, and efficacy in the following ways, respectively: 1) evocative language and visuals to communicate potential severe consequences, 2) relate messaging to the individual by drawing on how they are similar to someone who is susceptible to experiencing a negative consequence, and 3) address barriers and ways to overcome these barriers to enhance beliefs of self-efficacy, and inform people about the ways in which a health-related behaviour will overcome risk of these potential negative outcomes or threats. Rosenstock and colleagues (1988) discuss Bandura’s work on self-efficacy and outline that this may be most successfully promoted by enacting or experiencing a behaviour (“performance accomplishments”, pp. 180), and by observation of others (“vicarious experience”, pp. 180).

**Vulnerability**

Will and Geller (2004) note that people may see greater risk if threats are novel, easy to remember, out of their control, pose danger to susceptible groups, and if they
feel personally at risk. It also has been suggested that information drawing on personal or familial experiences of those who have suffered may be an effective strategy for communicating risk messages (Michaelsen, 2006). In line with this, targeting risk and vulnerability through information that is communicated in a way that will be well remembered, such as by using stories, is recommended (Will, 2005; Will & Geller, 2004), and combining emotionally arousing injury or case stories with pictures that are intended to invoke increased emotions amongst viewers has been done in some video-based safety interventions (Morrongojello, Zdzieborski, Sandomierski, & Lasenby-Lessard, 2009b; Will et al., 2009). This technique of making materials more personal and memorable also has been applied to the water context, with spinal cord injury stories from those becoming quadriplegic from unsafe diving practices being included in a water safety educational video called *Sudden Impact* (Bhide, Edmonds, & Tator, 2000). This video also presented statistics, and student viewers qualitatively reported that this targeted their personal vulnerability beliefs toward diving-related spinal cord injuries (Bhide et al., 2000).

Injury stories that portray parents who are perceived by viewers as being similar and in relatable situations may enhance parents’ attention towards injury risk and vulnerability information. Mothers receiving intervention materials containing emotionally arousing testimonials from other mothers about their child experiencing a drowning incident have reported being able to relate to the mother providing the testimonial (Girasek, 2011, pp. 695). Furthermore, Kreuter and colleagues (2010) found that compared to an informational video about breast cancer, a narrative one was not only preferred by viewers, but more effective in targeting beliefs about the scope of this health risk, perceptions of barriers to health-preventive behaviours, perceived effectiveness of these, as well as behavioural intentions. Related to this is the finding that injury information containing a testimonial from another parent supporting a particular safety behaviour has been shown to be effective in promoting new safety behaviours among parents (Nansel, Weaver, Jacobson, Glasheen, & Kreuter, 2008). In sum, these results suggest that stories reflecting injury experiences may be an effective
way to reach parents, and offer potential for enhancing their commitment towards safety.

**Injury Experiences as ‘Teachable Moments’**

The mechanism through which injury stories impact parents’ safety related beliefs, intentions, or behaviours may be related to the concept of a *teachable moment*. Past research has shown that child injury experiences can make parents more aware of injury risk (Glik et al., 1991; Morrongiello et al., 2009a) and, specifically, that personal experience with a non-fatal drowning was associated with parents possessing more vigilant views about children’s supervisory needs around water and more conservative beliefs about drowning risk (Morrongiello et al., 2013a). An injury experience may therefore serve as a teachable moment, which is used most commonly to refer to an “opportune moment for instruction and/or learning” (Lawson & Flocke, 2009, pp. 26). An important idea discussed by Lawson and Flocke (2009) is that teachable moments may be *created*, which has important implications for intervention programming and a key reason why injury stories may be so effective in communicating risk information. Another way to conceptualize a teachable moment is that the occurrence (i.e., injury, or health-related event) may serve as a *cue* for adopting health behaviour, which is consistent with the concept of cue to action in the HBM (Lawson & Flocke, 2009). Therefore, providing parents with injury stories about fatal and non-fatal drownings may effectively target their safety beliefs (i.e., vulnerability to risk) and act as an impetus for subsequent safety behaviours, regardless of whether they have had first-hand experience with what was portrayed.

**Optimism Bias and Unrealistic Appraisals of Risk**

Optimism bias is defined as “an underestimation of the *likelihood* (or probability) of experiencing negative events” (Weinstein & Klein, 1996, pp. 2). Weinstein (1983) discusses that optimism bias may occur when people remember risk reducing rather than risk enhancing information, do not have knowledge of how to protect against risk, and do not think about others’ vulnerability. Rosales and Allen (2012) provide recommendations to counter the possibility of optimism bias, and
applied to the drowning prevention context these may include: building on beliefs about vulnerability and evoking fear, encouraging parents to consider similar others when assessing risk as a way to have them connect on a personal level with the health threat, and pointing out risky child behaviours that could lead to fatal or non-fatal drownings. Will and Geller (2004) also note that perceptions regarding vulnerability to a health risk are an important target for safety interventions aimed at those with optimism bias about that risk. In fact, for health topics where optimism bias has been established, providing people with feedback about the risk of similar others and then asking them to rate their vulnerability to risk compared to others’ has successfully countered optimism bias (Weinstein, 1983). Therefore, enhancing beliefs about vulnerability may have the secondary effect of combatting optimism bias about safety threats.

There is also some suggestion that enhancing perceptions of risk by providing feedback on actual risk, thereby promoting a more realistic appraisal, can effectively reduce optimism biases and subsequently target some health behaviours as well (Kreuter & Strecher, 1995). Hence, encouraging accurate judgments of children’s drowning risk may be effective in countering optimism bias amongst parents with children in swimming lessons. Optimism bias is reportedly also high when health risks and their circumstances are seen as in one’s control (Weinstein, 1983). It may be that parents see children as being in control of their own swim skill and capable of keeping themselves safe, so providing information about the unpredictable nature of drownings (i.e., many children drown from falls into the water; children are not developmentally capable of controlling their own drown-risk) could also target parents’ optimism bias.

Making parents aware of the possibility that their child could engage in risk behaviour that poses an injury threat may be another appropriate technique for targeting safety related beliefs and behaviours. Parents with children aged four to seven who saw a video of their child interacting with contrived hazards in a laboratory setting had less hazards identified in their home after the video
intervention, and possessed less risky views about supervision practices, compared to a control group (Brown, Roberts, Mayes, & Boles, 2005). This suggests that promoting a more realistic understanding of their child’s capabilities and possible behaviours in hazardous contexts may be an effective way to communicate risk information to parents. Consistent with this is the perspective that educating parents about children’s actual drowning risk, and building on their beliefs about the negative consequences of non-fatal drownings, can play important roles in drowning prevention (Michaelsen, 2006).

**Summary About Messaging and Risk Communication**

Theory and past research suggest that it may be effective for safety interventions to provide information that: enhances knowledge, targets beliefs related to severity, vulnerability, and optimism bias, and evokes fear and strong emotions while at the same time building on parents’ self and response efficacy. Severity beliefs may be successfully targeted by expressive language and images, and vulnerability beliefs through memorable information that is seen as personally relevant and relatable. Vulnerability can also be addressed by the use of statistics, visuals, injury stories, narrative, and testimonials, and this is important not only to evoke fear but also to combat optimism bias. Notably, injury stories may create teachable moments and serve as cues to motivate parents’ safety and supervisory behaviours.

Communicating risk and fear enhancing information, highlighting the vulnerability of their own child, comparing personal vulnerability to the vulnerability of others (i.e., comparative risk appraisals), and promoting accurate risk judgments may also target optimism bias. Enhancing self-efficacy beliefs is another key component of effective risk communication, and this can be done by addressing barriers and providing suggestions for how to overcome these, and having parents experience (first hand, or vicariously) success in closely supervising children around water.

**Message Dissemination Approach and Format**

Evidence suggests that parents support opportunities aimed at enhancing their knowledge about safety. They have been shown to be amenable toward chances to
access free safety information (i.e., CPR, first aid) (Lee & Thompson, 2007; SAGE Research Corporation for Family and Child Health Unit, Health Canada, 1996), and water safety training taking place in conjunction with children’s swimming lessons (Moran & Stanley, 2011).

Will and colleagues (2012) use the term *progressive dissemination* when referring to a more active approach to reach parents and through varied methods. A safety intervention about booster seat use for parents of young children that employed an active and multi-component message delivery approach (i.e., storybook, simulated crash footage, computer presentation, take-home information presented in novel and visual ways) has had promising longer term effects on some aspects of parent knowledge concerning safety information, and was associated with improvements in self-reported safety behaviour (Snowdon, Hussein, Purc-Stevenson, Follo, & Ahmed, 2009). Drowning awareness can be enhanced at the community level (e.g., *Be Water Wise* campaign in the Netherlands, targeting the zero to four year age group) using multifaceted strategies including handing out information at swimming pools and having demonstrations at pools (Ridder, 2006). Informational handouts about drowning prevention that are short (i.e., one page), presenting material in point form and at a grade four or five reading level (Chesser et al., 2011), may be beneficial.

Bhide and colleagues’ (2000) study suggests that water safety videos aimed at injury prevention (e.g., *Sudden Impact*, about spinal cord injuries) that are disseminated at the community level are well used, particularly in pool settings. Presenting information (i.e., scope of child drownings, fear inducing scenes and testimonials, drowning prevention) in a video format also has been shown to be effective in targeting beliefs specific to water safety (i.e., CPR) (Girashek, 2011), and to generalize towards both injury beliefs (Morrongiello et al., 2012a) and supervision behaviours (Morrongiello et al., 2012b). Posters that reinforce safety information have also been effectively used as part of parent-focused education programs that take place at swim schools while children are in lessons (Moran et al., 2012b). Furthermore, a systematic review about the effectiveness of education programs aimed at unintentional injuries
to children under 15 revealed that programs where information was delivered orally were effective in impacting safety behaviours, knowledge, and beliefs (Pearson et al., 2012). In addition, information delivered orally combined with targeted activities may be used to positively affect safety behaviour (Pearson et al., 2012).

Tailoring information also has been found to be supported by message recipients for communicating water safety information (Quan et al., 2006b), and tailored injury prevention information for parents appears to motivate and encourage them to implement safety behaviours (Nansel et al., 2002, 2008). While personalizing educational materials to the profile of every individual child may not be feasible on a large scale, adjusting parent-focused intervention materials to reflect the specific experience of children aged two through five in swimming lessons (i.e., the focus of the current study) is possible.

**Summary About Message Dissemination**

In summary, these findings suggest that tailored water safety information for parents of toddlers in swimming lessons may be effectively disseminated in pool settings through the application of comprehensive and multifaceted strategies, including: educational handouts, video presentation, on site demonstrations, and oral presentations.

**The Current Study**

**Rationale**

Research suggests that parents often make mistaken beliefs about drowning risk and children’s supervisory needs around water, and those with young children enrolled in swimming lessons may be particularly vulnerable to this. Specifically, these parents may be at risk for developing an optimistic bias regarding their child’s swim skills and believing that, as toddlers accumulate swim experience, they become more capable of securing their own safety and require less supervision. This is a worrisome prospect given that most children at this age are, developmentally, not able to independently keep themselves safe and in fact require active, arms’ reach supervision (Nguyen et al., 2003).
Building on this background, the current study aimed to develop and evaluate an educational intervention targeting parental perceptions related to supervision, drowning risk, optimism bias, and water safety. This intervention, called ‘S.A.F.E.R. Near Water’, was designed to influence outcome variables related to parents’: 1) knowledge, 2) optimism bias, 3) judgments about their child’s swim skills, 4) supervision beliefs and self-reported supervision practices, and 5) perceived drowning risk. The current study also aimed to evaluate the extent to which program messages were rated by parents as being effectively communicated. S.A.F.E.R. Near Water was delivered to parents of children aged two through five who were enrolled in swimming lessons. A multifaceted messaging dissemination approach was used, with delivery of intervention components (seminars, take-home handouts, posters) occurring several times over the course of children’s swim lesson period (see Figures 1 and 2 for a program logic model). Parents also completed questionnaire measures before and after participation in the program.

S.A.F.E.R. Near Water was delivered to parents in two swim organizations (Public, Private). Within each swim organization, parents at different pool sites participated. Parents at one pool were designated the Intervention Condition and received S.A.F.E.R. Near Water, and parents at the other pools were designated the Control Condition and did not receive the program. Therefore, there were four participant groups in total: 1) Intervention-Private, 2) Intervention-Public, 3) Control-Private, and 4) Control-Public.

Method

Participant Information

At the beginning of the study period, 219 parents in the Intervention Condition and 275 parents in the Control Condition filled out the Time 1 questionnaire. However, inclusion criteria for the current analyses required that parents in both Conditions completed the Time 1 and Time 2 questionnaires, and that those in the Intervention Condition attended both S.A.F.E.R. Near Water Parent Seminars. Considering these criteria, the final sample comprised a total of 92 parents in the
Intervention Condition (72% mothers, 28% fathers), and 150 parents in the Control Condition (81% mothers, 19% fathers). Parents in both Conditions predominantly identified their ethnicity as ‘White/European’ (89% in Intervention Condition, 83% in Control Condition). Education level was consistent across Conditions, with most parents endorsing at least a college or university degree (90% in Intervention Condition, 86% in Control Condition). Furthermore, child gender was fairly balanced across the Intervention (46% girls, 54% boys) and Control (52% girls, 48% boys) Conditions. Eighty one percent of parents in the Intervention Condition indicated an annual take-home income of at least $80,000, compared to 70% of parents in the Control Condition. See Tables 1 and 2 for additional demographic information, and for data presented separately based on Condition (Intervention, Control) and Type Organization (Public, Private).

To determine whether there were any significant differences between parents in Public and Private groups on demographic factors that may be considered to produce bias in results, a series of analyses were conducted. Results from a one-way ANOVA revealed that parents in the Private group had children who were significantly younger ($M = 3.87$ years, $SD = .89$) than children in the Public group ($M = 4.29$ years, $SD = .86$), $F(1, 234) = 13.65, p < .001$. Parents in the Private group also had a significantly greater annual income ($M = 6.01$, $SD = 1.17$) than those in the Public group ($M = 5.01$, $SD = 1.53$), $F(1, 226) = 29.96, p < .001$ (range: 1 to 7, 1 = Below $20,000, 7 = Above $120,000$).

Further one-way ANOVAs revealed no significant difference between Public ($M = 4.11$, $SD = .74$) and Private ($M = 4.06$, $SD = .63$) groups in the level of parent education, $F(1, 240) = .29, ns$ (range: 1 – 5, 1 = Some high school, 5 = Post-graduate training). There was also no significant difference between Public ($M = 2.32$, $SD = 1.19$) and Private ($M = 2.55$, $SD = 1.09$) groups on the number (range: 0 – 4) of safety courses (e.g., first aid, CPR, pre-natal, and parenting) taken, $F(1, 239) = 2.43, ns$, a possible proxy variable for exposure to child safety related information. Additionally, chi-
square analyses revealed no significant association between child gender \[X^2(241) = 1.81, ns\] or ethnicity \[X^2(240) = 10.88, ns\] and Type Organization (Public, Private).

**Project Overview and Design**

Parents in Intervention and Control Conditions at both swim organizations completed the same measures pre-intervention (Time 1) and post-intervention (Time 2). At Time 2, parents in the Intervention Condition only completed evaluation questions about their opinions regarding the effectiveness of intervention components. Parents in the Intervention Condition also participated in two in-person psycho-educational seminars about water safety that occurred over the course of their child’s swim lesson period, one at the beginning and another toward the end. These seminars took place on site in a room near the pool and were offered during children’s swim lesson time (approximately 30 minutes in duration). At each seminar, in addition to being exposed to the intervention activities (oral and video presentation of water safety information), parents completed a knowledge survey before (pre) and after (post) the seminar. The post survey was intended to assess parents’ acquired knowledge of the information that was communicated during seminars. Parents also received a one-page take-home handout reinforcing key messages communicated during the seminar, as well as a list of websites where they could access full versions of the videos used in the presentation. Furthermore, posters that reinforced *S.A.F.E.R. Near Water’s* messages were also displayed at Intervention pool sites (see Appendix A for pictures of these). These posters did not appear at the Control pools.

**Description of Swim Organizations**

The Private swim organization comprised three pool sites, two that are standalone locations and one that is located within a fitness club. The same swim curriculum is taught across these three locations. The standalone pool site located in Milton, Ontario was designated the Intervention Condition. The other two sites located in Brampton, Ontario were designated the Control Condition (parents had the option of attending lessons at either of the two Brampton locations on a given week).
Both pools in the Public swim organization were located within recreation centres in different parts of Guelph, Ontario. The pool site where meeting room space was available to deliver *S.A.F.E.R. Near Water* was designated the Intervention Condition, and the other pool site was designated the Control Condition.

Swim lessons at both Private and Public sites adhere to the Red Cross swim curriculum, provided in 30-minute sessions, one time per week. Parents at all sites had the option of watching their child in lessons, either from an observation area or the pool deck. *S.A.F.E.R. Near Water* was delivered to parents in the Private organization during the fall swim lesson period (15 lessons) and to parents in the Public organization during the winter swim lesson period (nine lessons).

**Participant Recruitment and Data Collection Procedures**

A variety of recruitment strategies were used, with specific methods at each site being guided by the swim organizations’ resources and preferences, as well as by necessary practical considerations. Swim school staff at the Private organization sent an invitation email to parents of children in the target age range (separate emails for Intervention and Control Conditions) that contained study information and a link to access the online questionnaire. With the aim of increasing participant response within the Intervention Condition, a research assistant attended lessons at the beginning of the swim lesson period to distribute invitation letters by hand (this has been done previously by the authors with success; Morrongiello et al., 2013a). All data from the Private organization were collected online.

For the Public organization, research assistants attended the first two lessons of the swim period for children in the target age range at both Intervention and Control sites to recruit participants. Parents had the option of completing the questionnaires online (link provided to them in an invitation letter) or by hand on the spot during their child’s lessons. If parents were not able to finish the questionnaire on the same day, the research assistant collected this and brought it back for the parent the following week. Invitation posters were also displayed at the Public pools, and the
link to access the online questionnaire (separate links for Intervention and Control groups) was provided on a tear off pad.

Children’s swim instructors also took part in this study by completing a short survey where they rated children’s swim skills. Prior to swim instructor involvement, a study facilitator attended the swim instructors’ training session to review project procedures and how to complete the swim skill survey. Data were collected online for instructors at the Private organization, and through paper-and-pen versions at the Public organization (consistent with swim organization preference).

**Power and Sample Size Estimate**

While case-control intervention studies relevant to child drowning do exist at the community level (Girasek, 2011; Moran & Stanley, 2006b; Moran & Stanley, 2011), these often do not report effect sizes. Such studies appear to be guided by the availability and willingness (Moran & Stanley, 2006b; Moran & Stanley, 2011), or eligibility (Girasek, 2011), of participants, rather than by power analyses to confirm adequacy of the sample size for obtaining the expected effects. Therefore, there were some challenges with estimating effect sizes for the current study based on research in the drowning area. Morrongiello and colleagues (2012b) noted similar difficulties estimating effect sizes for their parent-focused intervention about toddlers’ home injury, given the paucity of specific research on this topic. To overcome this, they drew more broadly on research relevant to parent interventions about child injury and estimated achieving medium effect sizes for their study (Morrongiello et al., 2012b). The current study applied these same estimates, setting the Type 1 error rate to .05 and power at .80 (Morrongiello et al., 2012b).

For the current study, the required sample size for each of the two conditions (Intervention, Control) was calculated using the software program G*Power 3.1.0. Applying a medium effect size ($f = .25$), with Type 1 error at .05 and power at .80, 128 participants are considered to be needed in total (approximately 65 in each the Intervention and Control Conditions). The sample size that was achieved exceeded this estimate.
Schedule of Data Collection

Prior to completing the questionnaires, parents were presented with a consent form. Those who completed the questionnaires by hand provided written consent, and those who completed these online checked a box to indicate their consent. The current study received approval by the Research Ethics Board at the University of Guelph, and was carried out in accordance with the University of Guelph’s ethical standards for research. During the study period, consenting parents of children aged two through five completed the same questionnaire two times over the course of their child’s swimming lessons: (1) at the beginning (i.e., within the first two lessons) of the swim lesson period (Time 1: pre-intervention; see Appendix B for Time 1 questionnaire); (2) at the end (i.e., at or soon after the last lesson) of the swim lesson period (Time 2: post-intervention; see Appendix C for Time 2 questionnaire). Parents also completed a short demographics survey (see Appendix D) before completing the questionnaire at Time 1. The parent (mother, father) who attended lessons with the child, or who was most familiar with their child’s swim skills, was invited to participate. Parents were compensated with a gift card each time they completed the questionnaire. This schedule of data collection, with similar incentives, has been used previously by the authors (Morrongiello et al., 2013a).

Swim Instructor Involvement

Swim instructors completed a short measure (see Appendix E) assessing the swim skills of children whose parents were participating in the study. This measure contained the same questions that parents also completed, and was done at corresponding time points over the course of the swim lesson period (both parents and swim instructors completed the rating at the beginning and end of lessons). The authors have used this data collection procedure and schedule previously with swim instructors teaching community lessons (Morrongiello et al., 2013a). Swim instructors were provided with a gift card at each time point as a token of appreciation for their help.
Intervention Delivery

Dissemination Methods

*S.A.F.E.R. Near Water* provided parents with educational materials using a multifaceted delivery approach, including: (1) in-person educational seminars (oral presentation, accompanying slides, video) for parents to attend during their child’s swim lesson time, (2) informational handouts and video resources provided at the end of seminars, and (3) posters displayed at swim facilities during the study period. One aim in developing *S.A.F.E.R. Near Water* was to create intervention components that could be manualized, and for which replication would be feasible.

Disseminating program materials using social media outlets was considered. However, given the difficulties controlling access to these sites, and to avoid contamination of the Control Condition with intervention materials, it was decided that social media would not be used. Furthermore, since not all parents were expected to necessarily use or have access to these sites, informational handouts were considered more appropriate. This also ensured that all participants in the Intervention Condition had received the material, allowing for more controlled dissemination of messaging. Lastly, the use of informational handouts permitted the framing of messages without constraints from social media sites (e.g., character limits).

Messaging Approach

The messaging for intervention materials was generally framed using a three-phase approach. These phases, consistent with the literature reviewed above, was modeled after a parent-focused intervention about home injuries that focus groups with parents revealed to be effective in communicating information about close supervision (Morrongiello et al., 2009b), and that subsequent evaluation research demonstrated was successful for targeting injury beliefs (Morrongiello et al., 2012a) and supervision behaviours (Morrongiello et al., 2012b). These three phases involve: presenting information about drowning (Phase 1); providing messaging to empower parents to more closely supervise children around water (Phase 2); addressing
common barriers to close supervision and providing suggestions to help parents more closely supervise (Phase 3).

*S.A.F.E.R. Near Water* program materials targeted several content areas, as guided by past research (reviewed above) identifying risky parental beliefs about drowning, children’s swim competence, and supervision needs around water, as well as by relevant health belief and behaviour theories. These general areas are outlined below, followed by the specific messages communicated by each program component.

**Child Development (Vulnerability)**

Consistent with the notion of taking a developmental approach to drowning prevention, *S.A.F.E.R. Near Water* focused on normative developmental factors that place children at high risk for drowning, including their natural curiosity, unpredictability, cognitive capacity, susceptibility to peer modeling, motor development, and physical limitations. *S.A.F.E.R. Near Water* highlighted the actual capabilities of children aged two through five with the aim of inciting in parents a more realistic understanding of this.

**Scope and Burden of Child Fatal and Non-fatal Drownings (Severity, Vulnerability)**

Parent beliefs about children’s vulnerability for fatal and non-fatal drownings, including the potential severe and long-term consequences of these outcomes, were targeted. Parents were provided with Canadian data about the prevalence of these incidences to highlight the threat, and videos intended to arouse emotion were included.

**Factors Associated With Drownings (Vulnerability)**

Parents were provided with information regarding common locations for child drownings, as well as about activities and mechanisms that can lead to drowning for young children.

**Relation Between Caregiver Supervision and Child Drownings (Response Efficacy, Benefits, Behavioural Control, Self-Efficacy)**

The importance of close and active adult supervision for the safety of young children was emphasized, with specific reference to the fact that short lapses in
supervision are commonly associated with child drownings. Parents were provided with a clear explanation of the level of supervision that is required to ensure young children’s safety around water (i.e., arms’ length proximity, constant attention, continuous watching and focus). Information was also presented about how to supervise effectively, especially in the context of challenging situations. Understanding the tenets of successful supervision and how to provide this aimed to help parents realize that this is achievable, which in turn was expected to promote a sense of self-efficacy. The messages “Be Watchful, Stay Close!”, “It Can Wait”, and the “S.A.F.E.R.” acronym (Supervise by Always being Focused on the children and able to Extend your arms and Reach them) were reinforced throughout the course of the program. Other types of safety communications have used similarly memorable identifiers [i.e., Is It Worth It? YouTube video to promote safe texting (SMARTrisk, 2012); Stay on Top of it Washington drowning prevention campaign (Bennett et al., 1999); Turn around, don’t drown, Texas campaign in the aftermath of drowning deaths related to floods (WHO, 2014); Be cool, follow the rule and Think so you don’t sink, drowning prevention messages for children (Turgut, Yaman, & Turgut, 2015)]

Misconceptions and Erroneous Beliefs (Vulnerability)

S.A.F.E.R. Near Water addressed misperceptions about drowning that have the potential to influence how parents supervise and increase children’s risk, including: the time it takes for a child to drown, water depth associated with drowning, circumstances surrounding drowning, and what a drowning person looks like. Real video excerpts of fatal and non-fatal drownings (e.g., The Reasons People Drown) have been used as an effective education tool to target misconceptions that people have about drowning and what it looks like (Pia, 2006).

Swimming Lessons and Swimming Competency, and the Value of Supervision (Vulnerability, Optimism Bias, Response Efficacy, Cues to Action)

The value of young children’s swimming lessons was noted, and parents were also cautioned against overvaluing the protective function of lessons. The idea that swimming lessons and swimming skills do not replace children’s need for close adult
supervision was reinforced. Parents were encouraged to consider the skills that children aged two through five actually learn in lessons, and how this relates to drowning prevention. Information on the Swim to Survive standard was presented as a helpful benchmark for gauging when children are better prepared to save themselves from drowning. Parents were invited to reflect on their young child’s capabilities to help them realize she/he is likely not developmentally ready to achieve this standard. Overall, optimism bias was targeted by promoting parents’: reflection on their own child’s risk and skill level, accuracy in judgments about their child’s risk for drowning (i.e., even if they are in swimming lessons and developing skills, they may not be capable of keeping themselves from drowning), knowledge about the skills required to be capable of protecting oneself from drowning, and participation in making comparative risk appraisals between their child and other children in water contexts.

Videos depicting parents sharing their real story of having a child experience a fatal drowning were also incorporated. These testimonials were intended to arouse emotion in viewers. The videos aimed to create teachable moments for parents and highlight the value of active supervision in preventing drowning (i.e., response efficacy). These stories were also meant to serve as cues to action, encouraging parents to closely supervise. Furthermore, this personally relevant information was expected to enhance vulnerability beliefs. Past research has shown that testimonials from other parents can have the effect of targeting a false sense of security and be interpreted by parents as ‘wake up calls’ (Morrongiello et al., 2009b).

Common Barriers and How to Overcome These (Self-Efficacy, Perceived Behavioural Control, Subjective Norms)

Self-efficacy beliefs were promoted in parents by addressing and normalizing common barriers to supervision, providing suggestions to help overcome barriers, and encouraging parents to generate their own solutions to barriers. By providing concrete strategies for closer supervision, it was expected that parents would be more likely to believe that this is in their control and achievable (i.e., perceived behavioural control).
In addition to reflecting on others’ supervision experiences (e.g., vicarious experiences), parents were encouraged to think about occasions when they could closely supervise (e.g., actual experiences) as a way to promote self-efficacy (e.g., if they successfully enacted this behaviour in the past, they are capable of doing it again). Messaging was presented aimed at empathizing with parenting demands and difficulties, and parents were invited to think about situations where they may be able to improve their supervision. This was intended to appeal to subjective norms and promote parents’ willingness to act.

**Intervention Timing and Activities**

As elaborated upon above (Messaging Approach), *S.A.F.E.R. Near Water* program materials focused on: young children’s drowning risk, the importance of caregiver supervision as part of a comprehensive prevention approach, that arms’ length supervision is required even if children are in swim lessons, and that parents do have the capacity to ensure their child’s safety. The intervention components and study measures allowed for an evaluation of *S.A.F.E.R. Near Water* within the broader context of an assessment of how it impacted on parent beliefs before and after exposure.

**Primary Intervention Components**

**Parent Seminars**

Parent Seminars #1 and #2 occurred during lessons 4 and 11, and 3 and 8, at the Private and Public sites, respectively. This schedule was implemented to allow for adequate time at the beginning and end of the swim lesson period for parents to complete the questionnaires. The spacing between seminars was adjusted relative to the length of the lesson period, which differed across Private and Public sites. For each, the number of swim classes in between seminars represented 30% of the total number of lessons in the swim period. At the beginning of each Seminar (e.g., first five minutes), parents completed a short multiple-choice survey to assess their knowledge at baseline of the topic areas that would be covered during the Seminar (see Appendix F and G for pre-knowledge surveys from Seminars #1 and #2,
respectively). An oral presentation (with accompanying slides) and short video followed, together lasting approximately 15 minutes. Seminar facilitators were trained prior to study commencement to ensure knowledge of, and consistency across, the manualized delivery of program content. Facilitators were also trained to deliver the oral presentations using an appropriate interactional style, and about how to suitably address parents’ questions that may arise. On at least three occasions, presentations were observed by a third party to ensure fidelity in delivery. The video comprised a compilation of video clips, for which permission was obtained, using publicly available material from the Internet. The presentation and video addressed the key areas as reviewed in Messaging Approach, and the specific messages from each are outlined in more detail below. Parents completed the same multiple-choice survey at the end of the Seminar (e.g., last five minutes) to assess whether they had acquired the knowledge presented throughout (see Appendix H and I for post-knowledge surveys from Seminars #1 and #2, respectively). Thus, the pre/post knowledge surveys provided an immediate measure of parents’ understanding of, and memory for, the key safety messages presented in the Seminars. The post-knowledge survey also assessed parents’ ratings of how important, engaging, and emotionally arousing the Seminars were. Following each Seminar, parents received a one-page take-home informational handout reinforcing key messages and strategies from the Seminar presentation, as well as a list of links where full videos from which clips were obtained could be accessed (see Appendix J and K, and Appendix L and M, for the handouts from Seminar #1 and #2, respectively). To ensure that all parents received the take-home informational materials, facilitators provided these upon receipt of the post-knowledge survey and before parents left the Seminar room. The multi-media aspect (i.e., video) of the presentation and combination of information delivered in oral and written form was intended to enhance engagement and appeal to varying information processing preferences.
Oral Presentations

*Parent Seminar #1*

Below is a listing, in order of presentation, of the main target areas and associated messages from Parent Seminar #1. In general, material was presented in an order that followed the three phase messaging approach used by Morrongiello and colleagues (2009b), whereby: 1) information was presented about drowning, 2) messages that aimed to empower parents to more closely supervise children around water was provided, and 3) common barriers to close supervision were addressed, and parents were offered suggestions to help them more closely supervise their child around water.

- Vulnerability for drowning (e.g., children under the age of five comprise a high-risk group; Canadian statistics about drowning frequency).
- Burden of non-fatal drownings (e.g., frequency of hospitalizations; potential negative outcomes, such as brain damage, physical disability, learning and memory difficulties).
- Location of child drownings (e.g., in and out of the home; can occur anywhere there is water).
- To address potential misperceptions, accurate information was provided regarding: what drowning looks like (e.g., children do not call out for help, they are silent), how quickly drownings can occur (e.g., within 30 seconds), and water depth associated (e.g., can happen in a few centimetres of water).

- [Video shown here].
- Normative developmental vulnerabilities and risk factors (e.g., constantly changing/can do more every day, unpredictable).
- To increase engagement with the material, parents were invited to reflect on a time when their own child did something unpredictable that could have led to injury.
• Normative developmental vulnerabilities and risk factors (e.g., children’s quick movements, curious and fun-seeking nature, not able to accurately recognize danger and risks).

• No child is drown-proof; swim lessons prepare children for being in the water but are not a substitute for supervision.

• Parents invited to imagine a young child falling into the water fully clothed, and provided with developmental risk factors (e.g., may panic, may not remember what to do, wet clothes are heavy).

• Circumstances of child drownings (e.g., during short lapses in supervision).

• Introduction of the “Be Watchful, Stay Close!” message.

• Introduction of the “S.A.F.E.R.” acronym: “Supervise by Always being Focused on the children and able to Extend your arms and Reach them”.

• Empathize with challenges to providing close supervision (e.g., more than one child to care for, distractions).

• Parents invited to reflect on what takes their attention away from their child.

• Introduction of the “It Can Wait!” message.

• Concrete strategies provided to help parents more effectively supervise (e.g., avoid distractions, remove toys from water areas, designate an adult supervisor if there is more than one adult present).

• Research findings to confront optimism bias: parents with young children in swimming lessons have been found to believe that less supervision is needed as children become better swimmers, and can become optimistic that children can keep themselves safe; swim lessons reduce risk but are not a substitute for adult supervision.

• Parents invited to reflect on their own supervision practices (e.g., what works, and continue implementing these practices; potential practices that could be changed).

• Reinforcement of the main messages: 1) Be Watchful, Stay Close!, and 2) S.A.F.E.R.
Parent Seminar #2

Below is a listing, in order of presentation, of the main target areas and associated messages from Parent Seminar #2. In general, and for consistency, material was presented following the same three phase messaging approach (Morrongiello et al., 2009b) that was applied to material in Seminar #1 (see above).

- Scope and burden of child drowning (e.g., leading cause of death for Canadian children under the age of five).
- Locations and circumstances surrounding drowning (e.g., can occur close to the water’s edge, when playing in the water, in familiar and safe places).
- To address potential misperceptions, accurate information was provided regarding what happens when people drown (e.g., something unexpected often occurs before entering the water and when in the water) and why young children are at particular risk (e.g., do not have the necessary survival skills).
- [Video shown here].
- Discussion of the Swim to Survive standard, the three basic skills needed to prepare a child to survive an unexpected fall into deep water: 1) Roll into deep water, 2) Tread water for one minute, 3) Swim 50 metres.
- Parents invited to reflect on the question ‘Can your child Swim to Survive?’, and then prompted that their child likely cannot because most children at these young ages are not developmentally able to (Swim to Survive is taught in grade three).
- To promote a more realistic understanding of what young children learn in swim lessons, the specific skills that are taught were highlighted (e.g., getting face wet, jumping in, moving through water).
- Messaging to address optimism bias: rather than ‘swimming’, young children are more likely learning: 1) water comfort, 2) water familiarity, and 3) basic water safety skills.
- Parents invited to reflect on what their child is learning, what they are capable of, and how this relates to their ability to prevent themselves from drowning.
• Messaging to address optimism bias: swim lessons help, but do not eliminate risk or drown-proof children even if they have been in lessons for a while and are improving (i.e., may still experience unexpected situations, falls).
• Reminder of the “Be Watchful, Stay Close!” message.
• Normative developmental vulnerabilities (e.g., children are ‘top heavy’ and prone to falls, thinking and memory skills still developing so may not always judge danger well or remember rules).
• To promote a more realistic appraisal of their own child’s ability and risk, parents were invited to consider their child’s capabilities and whether this would be sufficient to save himself/herself from drowning.
• Research findings to confront optimism bias: many parents overestimate children’s water skills and can become optimistic that young children can keep themselves safe; however children under the age of five are the least likely to be able to save themselves.
• Swim to Survive standard as a helpful benchmark for knowing when children are better prepared to keep themselves safe.
• Reminder of the “S.A.F.E.R.” acronym.
• Empathize with challenges to S.A.F.E.R. (e.g., cannot watch child for every second of every day; need to balance children’s safety with supporting them to develop independence).
• Vulnerability for drowning (e.g., can happen quickly).
• Messaging to empower parents in their ability to supervise (e.g., encouragement to try their best to be S.A.F.E.R. and appeal to the importance of their child’s safety).
• Concrete supervision strategies and reminders provided (e.g., anticipate and plan, “It Can Wait!”, be in the water with your child).
• Parents invited to reflect on their supervision practices (e.g., what they do well, whether they may be able to implement these practices more often or generalize them to other situations).
• Reminder of the “Be Watchful, Stay Close!” message.
• Supervision strategy provided (e.g., designate a supervisor if more than one adult is present).
• Scope of child drowning (e.g., one child drowns every week in Canada).
• Messaging to empower parents’ prevention practices (e.g., you can prevent your child from drowning by applying S.A.F.E.R.).

Seminar Videos

Two short videos were created for the current study, one for use in each Parent Seminar (see http://cdru.psychology.uoguelph.ca). The videos focused on different key messages, while both reinforcing developmental factors that place young children at risk for drowning and why close, constant adult supervision is necessary to keep children safe. The videos were created by compiling clips from previously existing and publicly available video content across several sources. Living With Water, a series of free educational videos available from the Kids Alive Do The Five website was a key resource. Kids Alive do the Five is a population based water safety educational program (Gaida & Gaida, 2016). These Australian videos, featuring water safety expert Laurie Lawrence, take a developmental approach to drowning prevention (e.g., separate videos spanning ‘crawler’ to ‘preschool age’ stages) and communicate messages consistent with those of S.A.F.E.R. Near Water. Permission was obtained to use the Living With Water videos for the current project. Permission was also obtained from Lifesaving Society Canada to use clips of the Swim to Survive online video (http://www.youtube.com/watch?v=HBlS0os4m9Y), and from Safe Kids Greater Dallas to use clips from the ‘Know Before you Go’ safety video (http://www.youtube.com/watch?v=G3VcChB4C0o). The compilation video created for S.A.F.E.R. Near Water also features clips from a news story where Dr. Frank Pia talks about the “instinctive drowning response” (https://www.youtube.com/watch?v=X1mVcSUttX4).
**Seminar #1 Video**

The first stage of this 6 minute and 30 second video aims to grab parents’ attention and provide them with information they may not have previously known. The video begins with a real newscast story focusing on what drowning looks like, addressing a misconception, often perpetuated by movies, that people are active (e.g., flailing, bobbing) in the water. Dr. Frank Pia, an expert in lifeguard training and drowning prevention, provides voiceover describing the “instinctive drowning response” with accompanying video footage to demonstrate the motions of one’s drowning struggle. Dr. Pia highlights how quickly drownings can occur, and the ways in which a young child’s motions may be different from an adult who is drowning (i.e., targeting vulnerability beliefs).

With the aim of evoking emotion in viewers, while also communicating information about children’s vulnerability to drowning, the ‘Know Before You Go’ video clip was presented. The tone is somber and a preschool-aged child is shown walking through a doorway from a house towards a backyard pool. The message that drowning “only takes a minute” is communicated, connecting this time frame to a relatable and tangible event (e.g., “the time it takes to answer the phone, or greet a guest, or text a friend”). It highlights that one minute can “mean the difference between life, and death”, followed by underwater visual footage of the child being submerged (presumably falling) in the pool.

With the aim of continuing to foster emotional connection with the material, and to also communicate messages about the potential severe (e.g., fatal) consequences of drowning, two personal testimonials are provided by parents whose children experienced a drowning fatality. The first testimonial contrasts a mother’s description of her playful son with the “harshness” of her loss. The second describes a mother’s tragic experience of her young daughter’s bathtub drowning fatality. This mother reads excerpts from her composition, “Poems by a Grieving Mum”, where she expresses regret about leaving her child unattended in the bathtub. She demonstrates self-compassion in her poems (e.g., being “human” and “imperfect”), and also
demonstrates profound sadness and grief (e.g., “mindlessly sorry” for not being able to provide her child “her all”). In attempt to mitigate the possibility that these testimonials could evoke guilt or shame in viewers, a balanced messaging approach was applied. The parent testimonials shifted to focus on advice and ‘lessons learned’ from their loss experiences, providing viewers with hope and strategies to help them feel empowered in their ability to prevent drownings. The suggestions offered focus on the central role of close supervision (e.g., drownings happen quickly, avoid short lapses in supervision; important to have clear communication about which adult is supervising), as this was a factor specifically related with these mothers’ personal experience of having a child drown.

The tone of the video shifted to become more upbeat, with visuals of children playing in the water, and messaging aimed at further empowering parents in their ability to supervise. The “three elements of successful supervision” (attention, proximity, and continuity) were explained, highlighting the importance of actively watching, being within arms’ reach, and avoiding “lapses in concentration”. The message that “no child is drown-proof” was also emphasized.

Messages were then presented that empathized with challenges that parents face when supervising young children, and normative developmental characteristics (e.g., physical, cognitive) that make children more vulnerable to drowning injuries were highlighted. The video ended with a playful tone, and parents were also reminded of the importance of constant supervision.

**Seminar #2 Video**

With the goal of evoking interest and attention, this 5 minute and 46 second video begins with actual news footage clips about the location and burden of child drowning. A testimonial is then presented whereby a physician communicates drowning-related information based on his medical experience over 25 years with toddlers and infants suffering drowning injuries. The physician conveys facts related to the burden of drowning (e.g., scope and severity), locations where drownings can occur, how quickly these happen, and developmental vulnerabilities that place
children at greater risk. Clips were then shown where parents (the same mothers whose testimonials appeared in the Seminar #1 video) spoke about their emotional experience of having a child suffer a drowning fatality, and the importance of close supervision as a prevention approach.

The subdued tone of the video became lighter, with Laurie Lawrence as the narrator, speaking about the locations where child drownings can occur, messages related to balancing children’s developmental needs (e.g., growing independence) with their continued need for adult supervision, and the notion that child siblings are not appropriate supervisors. The components of successful (attention, proximity, continuity) and arms’ length supervision for preschool aged children were reinforced, as well as the message that “lifeguards are not babysitters”.

The content then focused on the benefits of swimming lessons, including: stimulation, social interaction, building confidence, water familiarization, and health and fitness. The importance of adult supervision, even for children with long-term experience in swimming lessons, was highlighted. Consistent with applying a developmental framework to communicating information, and with the aim of addressing optimism bias, the skills that young children in swimming lessons may develop were stated (e.g., increased coordination, movements may begin to look like swim strokes), but viewers were also cautioned against developing too much optimism in these skills. Specifically, it was noted that constant, arms’ length supervision is essential to keeping children safe around water and that swimming lessons do not drown-proof children.

Parents were then invited to contemplate several questions presented onscreen: “When will children be better prepared to keep themselves safe on their own in the water?” and “Can your child Swim to Survive”? Clips from the Life Saving Society’s Swim to Survive video followed, explaining the three basic skills necessary to survive an unexpected fall into deep water: 1) roll into deep water, 2) tread water for one minute, and 3) swim 50 meters. The video ends with the message that ‘surviving an unexpected fall into deep water is an important first step to being safe around water’.
Posters

Starting the week of the first Parent Seminar (lesson 3 and 4 for Public and Private organizations, respectively), and for the duration of the study, posters reinforcing S.A.F.E.R. Near Water main messages were displayed at Intervention pools in locations clearly visible for parents. Posters were rotated several times over the course of lessons (by swim organization staff at the Private site, and by research assistants at the Public site), with the aim of having poster messaging correspond to, and complement, the timing of message delivery in Parent Seminars. Reminders were provided to ensure that poster rotation took place according to schedule. Permission was granted by the Swim Australia organization to use their poster images for the current study’s posters. The authors also used original photographs taken specifically for the posters. Posters featured the “Be Watchful, Stay Close!” saying, and an additional S.A.F.E.R. Near Water key message. The S.A.F.E.R. poster (#6 below) was displayed for the duration of the poster period and was not rotated. See Appendix A for all posters.

Poster Messages and Visual Credits

1. Be Watchful, Stay Close! Children do unpredictable things and don’t recognize danger (visual: original photograph of a child using a pool noodle to reach for a ball in a pool).

2. Be Watchful, Stay Close! Children drown silently. They can’t call out for help. (visual: original photograph of a child standing alone at one end of a pool, looking out at the rest of the pool).

3. Be Watchful, Stay Close! Children drown quickly, when was the last time you were “back in a minute”? (visual: Swim Australia picture of an adult performing CPR on a child).

4. Be Watchful, Stay Close! Swim lessons reduce risk but do not replace the need for adult supervision. (visual: Swim Australia picture taken from underwater, directed upwards toward a blurry image of a child standing by the pool’s edge).

6. SAFER: Prevent Drowning. Young children drown quickly and silently. Bathtubs and pools are risk locations. Remember SAFER: Supervise by Always being Focused on the children and able to Extend your arms and Reach them.

**Take-home Informational Handouts**

At the end of each Seminar, parents received a one-page informational handout reinforcing key messages communicated during the oral presentation and video. See Appendix J and K for handouts from Seminar #1 and #2, respectively. In general, the handouts contained messages related to: circumstances surrounding drowning, locations that drownings can happen, developmental vulnerabilities that place children at greater risk, the importance of adult supervision even if children are in swimming lessons, the Swim to Survive standard as a way to know when children are better prepared to survive an unexpected fall into deep water, the role of arms’ length adult supervision in preventing child drowning, and strategies for helping parents implement closer supervision.

**Outcome Targets**

Collectively, the measures for the current dissertation assess parents’: (1) knowledge, (2) optimism bias, (3) judgments about their child’s swim skills, (4) supervision beliefs and self-reported supervision practices, and (5) perceived drowning risk. It was expected that the program activities (see Dissemination Methods and Messaging Approach) would enhance parents’ knowledge (e.g., of drowning risk, Swim to Survive benchmarks, developmental vulnerabilities, conceptualization of swim competence), which would relate to improvements in beliefs relevant to optimism bias, supervision, and drowning risk (see Figures 1 and 2).

**Measures and Data Reduction**

**Parent Opinions About Water Safety (POAWS) Questionnaire**

The POAWS was developed and used previously by the authors with parents of children aged two through five enrolled in public swimming lessons (Morrongiello
et al., 2013a, b), with pilot testing conducted prior to use. This questionnaire examines several aspects of parents’ beliefs regarding drowning risk. The various scales of the POAWS are outlined below. Modifications to the original questionnaire for use in the current study are also indicated.

**Water Safety Beliefs (WSB) Scale**

The Water Safety Beliefs (WSB) scale (question 15 of the POAWS, see Appendix B) measures beliefs relevant to drowning risk and water safety, the value of swimming lessons, and parent supervision. The WSB as used in the current study includes six additional items (24 items total) compared to the version used previously, with the aim of more comprehensively capturing the domains of interest. Some items were reverse scored to reflect that higher scores (range: 1 – 7, 1 = Completely Disagree, 7 = Completely Agree) indicate greater endorsement of the negatively framed factors.

To determine the factor structure that would be suggested based on the current study’s sample, an exploratory factor analysis was conducted on all Time 1 WSB data. Eight factors were recommended using Principal Components Analysis in SPSS, with the options for Eigenvalues greater than one and Varimax Rotation selected (see Appendix N for a listing of these). However, many of these contained only one or two items and the scree plot indicated three factors best reflected the data. These are listed below, along with the associated internal consistency values (Cronbach’s Alpha). As can be seen, the internal consistency for Factor 3 was poor and, therefore, the focus in the current study was on Factors 1 and 2, along with parents’ overall score (all 24 items; Cronbach’s Alpha = .73); the latter is considered an overall measure of parent beliefs relevant to water safety.

- **Factor 1: ‘Inaccurate Judgment of Swim Skill and Drown-risk Behaviour’**
  (Items: 4, 8, 11, 13, 16, 17; Cronbach’s Alpha = .76)

- **Factor 2: ‘Swim Lessons Reduce Supervision Need’** (Items: 6, 7, 10, 12; Cronbach’s Alpha = .69).

- **Factor 3: ‘External Locus of Control for Prevention’** (Items: 19, 21, 24; Cronbach’s Alpha = .54)
Supervision Scenarios

The POAWS also measures parents’ perceptions of their child’s supervisory needs around outdoor water (question 17 of the POAWS, see Appendix B). For these items, parents indicated the level of supervision they thought *their* child would require across five different types of water scenarios (25 items in total). The use of water-based scenarios to assess risk perceptions related to drowning is an approach that has been used by other researchers in the field (McCool et al., 2008). Each scenario represents varying water contexts (pools, lake, beach), and within each, parents were presented with varying social contexts (with friends, adult supervisors, sibling supervisions, when alone) that were the same across the water contexts. Therefore, this measure was developed to capture parents’ behavioural intentions to supervise their child across situations (water and social context) that posed varying levels of risk.

The Supervision Scenario scale used a six-point scale to reflect a broad range of supervision practices (1 = I would be watching *constantly* and would be *within arms’ reach* at all times to 6 = I would be nearby so I could *hear constantly* what was going on in the water, though I would not have my child in view). To specifically capture the varying degrees of supervision (Saluja et al., 2004), response options were developed along the dimensions of continuity, attention (visual, hearing) and proximity. This allowed for supervisory intentions to be measured with greater specificity and along a scale (range: 1 to 6) that rendered data that could be analyzed as if they were continuous. Lower scores on this measure indicate closer and more vigilant supervision practices.

Parents received a mean supervision score for each of the three water contexts, and for each of the four social contexts. Parents’ score for the pool context was based on the average score across the three pool scenarios (scenarios 1, 2, 5), whereas lake and beach scores were based on a single scenario (scenarios 3 and 4, respectively). Social context scores were calculated based on the average score (option 1 for alone, 2 for with friends, and 5 for sibling supervisor) across the three water contexts. As there are two items within each scenario relevant to the context of having an adult
supervisor present (option 3 and 4), for this social context only, parents’ mean score across the three water contexts was calculated based on two responses per scenario, rather than one like the other social contexts. Parents also received an overall supervision score, which was calculated as the average score across all water and social contexts (mean across all 25 items).

*Swim Competency Checklist*

A relative strength of the POAWS is that it applies a developmental approach to measuring swim skill, rather than focusing solely on the distance one can swim as some questionnaires do. The Swim Competency Checklist comprises 26 items reflecting differing water skills that children aged two through five are explicitly taught in lessons, and that respondents (both parents and swim instructors) answer ‘yes’ or ‘no’ to. Questions focus on the areas of assisted water comfort and familiarity, unassisted movement through the water, unassisted climbing and jumping water behaviours, and safety knowledge. The Swim Competency Checklist was developed for use in a previous study through consultation with swim directors at public lessons that adhere to the Red Cross swim curriculum (Morrongiello et al., 2013a), and the applicability herein was ensured by having private swim school staff confirm that items accurately reflected the skills taught in their programme too. Swim instructors completed the Swim Competency Checklist two times over the course of children’s swim lessons (beginning, end). Results from the swim instructors’ Swim Competency Checklists are beyond the scope of the current analyses and are not reported in this dissertation.

The parent version of the Swim Competency Checklist (question 16 of the POAWS, see Appendix B) comprised 14 additional items to assess parents’ perceptions of their child’s safety knowledge and water confidence. For ease of interpretation, parents received one score across all 40 items to reflect the percentage of ‘yes’ skills they endorsed. For the parent Checklist, items 29 and 36 (about being fearful or panicked) were reverse scored so that ‘yes’ responses were uniformly in the same direction and represented an assumption of more skill and confidence in the water. To
account for occasional missing data, the percent of ‘yes’ skills was calculated by dividing the total number of items answered by the number of ‘yes’ skills (e.g., number of ‘yes’ / number of ‘yes’ + number of ‘no’).

**Parent Supervision Attributes Profile Questionnaire – BEACH (PSAPQ-BEACH)**

The Parent Supervision Attributes Profile Questionnaire (PSAPQ) created by Morrongiello and Corbett (2006) measures supervision beliefs, protectiveness, risk tolerance, and fate beliefs. The PSAPQ was adapted by Petrass, Blitvich, and Finch (2011a) to ask specifically about the beach context (PSAPQ-BEACH). The subscales of protectiveness, supervision, and risk tolerance were of particular interest for the current study as measures of key aspects of parent supervision related to the water context. Petrass and colleagues’ (2011a) analyses demonstrated that for these three scales, test-retest reliability (.96, .98, .87, for each scale respectively) and internal consistency (.98, .99, and .93, for each scale respectively) were appropriately established.

For the current study, internal consistency values for each of the three PSAPQ-BEACH subscales (question 18 on the POAWS, see Appendix B) was calculated based on all Time 1 data. A list of items associated with each subscale and the associated Cronbach’s Alpha values are presented below. Items 16 and 24 were reverse scored.

- **Protectiveness** (Items: 1, 4, 6, 9, 19, 20, 22, 23, 26; Cronbach’s Alpha = .69)
- **Supervision** (Items: 2, 7, 8, 10, 12, 14, 15, 16R, 24R; Cronbach’s Alpha = .82)
- **Risk Tolerance** (Items: 3, 5, 11, 13, 17, 18, 21, 25; Cronbach’s Alpha = .85)

The scales of interest for this dissertation’s analyses are the Protectiveness and Supervision Scales, and parents received a mean score across items comprising each of these two scales (range: 1 – 5; 1 = Strongly Disagree, 5 = Strongly Agree).

**Results**

**Justification for Analytic Approach**

The main focus of this dissertation is whether the *S.A.F.E.R. Near Water* program effectively targets, and is associated with improvements in, parents’ perceptions relevant to children’s drowning risk and supervision needs. Therefore,
the key research question of interest concerns whether there are significant differences between Intervention and Control Groups at Time 2, after the *S.A.F.E.R. Near Water* program had been delivered. To determine whether sufficient justification existed, based on the data, to collapse across Public and Private groups and analyze only for differences between Intervention and Control Conditions, several steps were carried out prior to the main analyses.

**Step 1. Compare Public and Private Groups on Key Demographic Variables**

Based on the findings reported above (see Participant Information) that indicate significant differences between Public and Private groups on child age and family income level, these two variables were controlled for and entered as covariates in all analyses.

**Step 2. Examine the Inter-correlation Matrix Among Variables of Interest**

The inter-correlation matrix of the 14 dependent variables of interest at Time 1 was examined for the degree of association among them. While results revealed that most variables are significantly correlated (see Table 3), each variable is also considered distinct; thus, conducting separate analyses for each variable is believed to be justified, as results will provide insight into a broad range of facets of parents’ perceptions of risk and safety. Theoretically, it is also expected that these variables would be highly correlated because they all relate to supervision and drowning risk. For example, it is reasonable for there to be a high degree of association between parents’ beliefs about children’s supervision needs in different water contexts (All Contexts) and their overall water safety beliefs (WSB overall), \( r = .416, p < .01 \).

**Step 3. Explore the Intraclass Correlation (ICC) and Design Effect Factor (DEFF) Values for Each Dependent Variable of Interest**

Parents were assigned to one of four groups (Intervention-Private, Intervention-Public, Control-Private, Control-Public) based on the pool site where their child was enrolled in for swim class. For Private and Public swim organizations, *S.A.F.E.R. Near Water* was delivered at a separate pool from where Control parents’ children participated in lessons. While random assignment of participants was not
possible, and there were practical considerations when assigning which pool would be
designated the Intervention site (e.g., space within the facility to deliver the program),
this clustering of parents by pool site avoided contamination of the intervention.
Based on the project design, however, it was important to determine whether the main
analyses needed to account for any effects of clustering in the sample data. Not
adequately accounting for non-independence in the sample has the potential to bias
results. Therefore, to explore the potential for non-independence between Private and
Public clusters, the Intraclass Correlation (ICC) and Design Effect Factor (DEFF) were
examined for each of the dependent variables of interest.

As discussed in Killip, Mahfoud, and Pearce (2004), ICC is a “measure of the
relatedness of clustered data. It accounts for the relatedness of clustered data by
comparing the variance within clusters with the variance between clusters” (pp. 206).
Kaiser, Woodruff, Bilukha, Spiegel, and Salama (2006) define DEFF as the “ratio of the
variance of the estimate under the actual design used to produce the estimate to the
variance of the estimate assuming the same data to have come from simple random
sampling” (pp. 199). Therefore, a DEFF of 2.0 can be considered to mean that by
ignoring the clustering effects, standard error estimates for a given variable could be
inflated by twice that of when non-independence is accounted for.

The ICC and DEFF were explored separately for each of the 14 variables at
Time 1 and Time 2, as these data were expected to be highly correlated. Examining the
ICC and DEFF values was done to test for non-independence of Private versus Public
Type Organizations across the Intervention and Control Conditions. See Tables 4 and
5 for ICC and DEFF values for Time 1 and Time 2 variables, for the Intervention and
Control Conditions, respectively. It is noted that a DEFF value could not be estimated
for some variables, as their variances were too small.

Given that neither the Intervention nor the Control Condition had received
*S.A.F.E.R. Near Water* yet at Time 1, one would theoretically expect little difference in
ICC and DEFF values between Conditions at Time 1 (i.e., no reason to expect measures
of non-independence to be different across groups at Time 1). DEFF greater than two
indicates potential issues with dependencies among the data, and results indicated several variables (see Table 4) at Time 1 within the Intervention Condition that produced DEFF values greater than two. Therefore, for these variables, it could be problematic to ignore the effects of clustering for subsequent analyses. Non-independence was not an issue for any Time 1 variables within the Control Condition (i.e., no variables with DEFF values greater than two).

As the sample size between Public and Private groups was fairly balanced (n = 112 for Public, n = 114 for Private), if there were systematic differences between Public and Private groups, one would expect to observe these in both the Intervention and Control Conditions at Time 1. It may be that knowledge of being in the Intervention Condition differentially affected parents in the Public group compared to those in the Private group. It is also possible that any disproportionate differences amongst groups could be due to chance.

In conclusion, these results suggest that the assumption of independence was violated in Time 1 data across the four groups. This is likely why there were higher ICC values in the Time 1 data. Non-independence does not appear to be a significant concern in the Time 2 data. That is, there are few DEFF values greater than two and those that exist are likely a function of parents’ score from the first time period. Therefore, based on these results, there is sufficient justification to collapse across Public and Private Type Organizations as long as Time 1 score is used as a covariate when analyzing differences across experimental Conditions (Intervention, Control) in Time 2 data. Using Time 1 scores as a covariate will have the effect of creating equivalence amongst groups at Time 1.

**Step 4. Explore the Interaction Between Type Organization (Public, Private) and Condition (Intervention, Control) for Time 1 Dependent Variables**

To further justify collapsing across Public and Private Type Organizations, the interaction between Type Organization (Public, Private) and Condition (Intervention, Control) was explored for all of the Time 1 dependent variables of interest. For all of the 14 variables, a 2 x 2 ANOVA (Type Organization x Condition) was conducted. The
Type Organization*Condition interaction term for all variables was found to be non-significant (see Table 6 for interaction results and descriptive data for all 14 Time 1 variables). A non-significant interaction term suggests that the dependent variable does not change based on the level of the two factors (Type Organization and Condition). Therefore, this is considered to be further justification for collapsing across Type Organization to analyze results based on Condition.

**Step 5. Explore Justification For Using Regression Rather Than Analysis of Variance (ANOVA)**

While ANOVA was considered as an analytic approach, there were several reasons why regression was regarded as a more appropriate and robust analysis to address the research questions of interest.

ANOVA adjusts means based on the covariates entered, and this adjustment can impact the likelihood of finding significant differences between groups. In addition, entering Time 1 score as a covariate (which is indicated based on preliminary analyses) complicates the analysis and interpretation of results from repeated measures ANOVA. Regression, on the other hand, can control for covariates stepwise (Keith, 2006) so the effect of Condition after controlling for Child Age, Family Income, and Time 1 score can be specifically explored. Thus, regression increases the variance that can be explained in the dependent variable, by controlling for other variables (Keith, 2006). Regression also examines the rate of change instead of observed mean differences, as in ANOVA (Keith, 2006), which has greater explanatory benefit and more relevance to the current study.

Furthermore, regression results provide the significance level for each component in the model, as well as an estimate of the unique variance accounted for by each component (Keith, 2006). The output provided can also specifically address whether the percent (or magnitude) of change in Time 2 dependent variables is different between the Intervention and Control groups. No post hoc tests would be necessary with regression because results pertaining to differences between
Conditions at Time 2 are provided at the onset. Therefore, regression is a targeted and expeditious approach that also maximizes power.

**Main Analysis**

It is noted that the sample size, and degrees of freedom, for individual analyses presented herein may vary somewhat due to occasional missing data on some scales or questions.

1. **Conduct Separate Regression Analyses to Examine Whether the Rate of Change in Time 2 Scores Differs Between Intervention and Control Groups, After Controlling for Child Age, Family Income, and Time 1 Score.**

   Separate analyses were conducted to regress Child Age, Family Income, Time 1 score (block 1), and Condition (block 2) onto each of the Time 2 dependent variables of interest.

   Results were examined to ascertain the extent to which Condition (Intervention, Control) contributed to the prediction of each of the Time 2 variables of interest beyond the variance accounted for by the control variables (Child Age, Family Income, Time 1 Score). For 12 of the 14 variables of interest, Condition predicted a significant amount of variance in Time 2 ratings beyond what was predicted by the control variables. That is, with the exception of parents’ ratings of children’s protectiveness needs (Protectiveness) and the percent of swim skills they rated their child as being able to perform (Swim Skills – % Yes), the $R^2$ Change for all other variables was found to be significant. These results are presented in more detail below for each variable separately. See Table 7 for $R^2$, $R^2$ Change, and $F$ Change values associated with adding Condition to the regression in block 2 for each variable.

   The key research question of interest is whether there are increases or decreases associated with Time 2 scores (i.e., post-intervention), and if this is significantly different between Intervention and Control groups, after controlling for Child Age, Family Income, and Time 1 score. Therefore, the regression result of particular relevance is the B coefficient and $t$ value associated with Condition. There are two levels of Condition (1 = Intervention, 2 = Control), so B coefficients that are
positive indicate that the Control Group had a higher mean score, and B coefficients that are negative indicate that the Intervention Group had a higher mean score. The meaning of a positive or negative score varies across measures (e.g., for some measures a lower score indicates a less risky belief, and for other measures the opposite interpretation applies).

For 12 of the 14 variables of interest (all variables except for ‘Protectiveness’ and ‘Swim Skills - % Yes’), Condition was found to be a significant predictor of Time 2 score, such that parents in the Intervention Condition had scores reflecting less risk compared to parents in the Control Condition. These results are presented in more detail below for each variable separately. See Table 8 for a summary of Unstandardized B values, $t$ scores, and part correlations ($sr^2$) associated with Condition for each variable. See Table 9 for the Mean and Standard Deviation of each Time 2 score, for both the Intervention and Control Conditions.

**Parents’ Ratings of Their Own Child’s Supervision Needs Around Pools (Pool Water Context)**

After controlling for Child Age, Family Income, and Time 1 score, Condition accounted for 15% of the variance in parents’ Time 2 ratings of their child’s supervision needs around pools ($R^2_{\text{change}} = .15$, $F_{\text{change}} = F(1,204) = 62.38$, $p < .001$). Condition was found to be a significant predictor of parents’ ratings, accounting for 39% of unique variance in Time 2 score ($t = 7.90$, $p < .001$, $sr^2 = .39$). Furthermore, being in the Control Condition was associated with a .68 increase in Time 2 score compared to the Intervention Condition [B coefficient = .68 (95% CIs = .51 – .85)]. Lower scores on this measure indicate closer and more vigilant supervision.

**Parents’ Ratings of Their Own Child’s Supervision Needs Around Lakes (Lake Water Context)**

After controlling for Child Age, Family Income, and Time 1 score, Condition accounted for 3% of the variance in parents’ Time 2 ratings of their child’s supervision needs around lakes ($R^2_{\text{change}} = .03$, $F_{\text{change}} = F(1,204) = 7.87$, $p < .01$). Condition was found to be a significant predictor of parents’ ratings, accounting for 17% of unique
variance in Time 2 score ($t = 2.81, p < .01, s^2 = .17$). Furthermore, being in the Control Condition was associated with a .19 increase in Time 2 score compared to the Intervention Condition [B coefficient = .19 (95% CIs = .06 – .32]). Lower scores on this measure indicate closer and more vigilant supervision.

**Parents’ Ratings of Their Own Child’s Supervision Needs Around Beaches (Beach Water Context)**

After controlling for Child Age, Family Income, and Time 1 score, Condition accounted for 10% of the variance in parents’ Time 2 ratings of their child’s supervision needs around beaches ($R^2_{change} = .10, F_{change} = F(1, 206) = 37.70, p < .001$). Condition was found to be a significant predictor of parents’ ratings, accounting for 31% of unique variance in Time 2 score ($t = 6.01, p < .001, s^2 = .31$). Furthermore, being in the Control Condition was associated with a .62 increase in Time 2 score compared to the Intervention Condition [B coefficient = .62 (95% CIs = .42 – .82)]. Lower scores on this measure indicate closer and more vigilant supervision.

**Parents’ Ratings of Their Own Child’s Supervision Needs When the Child is Alone (Alone Social Context)**

After controlling for Child Age, Family Income, and Time 1 score, Condition accounted for 11% of the variance in parents’ Time 2 ratings of their child’s supervision needs when alone ($R^2_{change} = .11, F_{change} = F(1, 204) = 35.10, p < .001$). Condition was found to be a significant predictor of parents’ ratings, accounting for 33% of unique variance in Time 2 score ($t = 5.92, p < .001, s^2 = .33$). Furthermore, results indicated that being in the Control Condition was associated with a .46 increase in Time 2 score compared to the Intervention Condition [B coefficient = .46 (95% CIs = .31 – .61)]. Lower scores on this measure indicate closer and more vigilant supervision.

**Parents’ Ratings of Their Own Child’s Supervision Needs When the Child is With Friends (Friend Social Context)**

After controlling for Child Age, Family Income, and Time 1 score, Condition accounted for 11% of the variance in parents’ Time 2 ratings of their child’s
supervision needs when with friends \((R^2 \text{ change} = .11, F \text{ change} = F (1, 204) = 37.79, p < .001)\). Condition was found to be a significant predictor of parents’ ratings, accounting for 33% of unique variance in Time 2 score \((t = 6.15, p < .001, \text{sr}^2 = .33)\). Furthermore, results indicated that being in the Control Condition was associated with a .44 increase in Time 2 score compared to the Intervention Condition \([B \text{ coefficient} = .44 (95\% \text{ CIs} = .30 – .59)]\). Lower scores on this measure indicate closer and more vigilant supervision.

*Parents’ Ratings of Their Own Child’s Supervision Needs When the Child is With Adults (Adults Social Context)*

After controlling for Child Age, Family Income, and Time 1 score, Condition accounted for 12% of the variance in parents’ Time 2 ratings of their child’s supervision needs with adults present \((R^2 \text{ change} = .12, F \text{ change} = F(1, 203) = 54.48, p < .001)\). Condition was found to be a significant predictor of parents’ ratings, accounting for 35% of unique variance in Time 2 score \((t = 7.38, p < .001, \text{sr}^2 = .35)\). Furthermore, results indicated that being in the Control Condition was associated with a .61 increase in Time 2 score compared to the Intervention Condition \([B \text{ coefficient} = .61 (95\% \text{ CIs} = .45 – .77)]\). Lower scores on this measure indicate closer and more vigilant supervision.

*Parents’ Ratings of Their Own Child’s Supervision Needs When the Child is With Siblings (Siblings Social Context)*

After controlling for Child Age, Family Income, and Time 1 score, Condition accounted for 15% of the variance in parents’ Time 2 ratings of their child’s supervision needs with siblings present \((R^2 \text{ change} = .15, F \text{ change} = F(1, 203) = 55.81, p < .001)\). Condition was found to be a significant predictor of parents’ ratings, accounting for 38% of unique variance in Time 2 score \((t = 7.47, p < .001, \text{sr}^2 = .38)\). Furthermore, results indicated that being in the Control Condition was associated with a .72 increase in Time 2 score compared to the Intervention Condition \([B \text{ coefficient} = .72 (95\% \text{ CIs} = .53 – .91)]\). Lower scores on this measure indicate closer and more vigilant supervision.
Parents’ Ratings of Their Own Child’s Supervision Needs Across a Variety of Social and Water Contexts (All Contexts)

After controlling for Child Age, Family Income, and Time 1 score, Condition accounted for 14% of the variance in parents’ Time 2 ratings of their child’s overall supervision needs across all contexts ($R^2_{change} = .14$, $F_{change} = F(1, 204) = 63.09$, $p < .001$). Condition was found to be a significant predictor of parents’ ratings, accounting for 38% of unique variance in Time 2 score ($t = 7.94$, $p < .001$, $sr^2 = .38$). Furthermore, results indicated that being in the Control Condition was associated with a .58 increase in Time 2 score compared to the Intervention Condition [B coefficient = .58 (95% CIs = .44 – .72)]. Lower scores on this measure indicate closer and more vigilant supervision.

Parents’ Ratings of the Percent of Swim Skills They Believe Their Child is Able to Perform (Swim Skills - % Yes)

After controlling for Child Age, Family Income, and Time 1 score, as expected, Condition did not account for a significant amount of variance in parents’ Time 2 ratings of their child’s swim skills ($R^2_{change} = .003$, $F_{change} = F(1, 216) = 1.96$, $ns$). Consistent with this, Condition was not found to be a significant predictor of parents’ Time 2 ratings [$t = 1.40$, $ns$, $sr^2 = .05$, B coefficient = 1.86 (95% CIs = -.76 – 4.48)].

Parents’ Beliefs Suggesting Inaccurate Judgment of Children’s Swim Skill and Drown-risk Behaviour (Factor 1: Inaccurate Judgment)

After controlling for Child Age, Family Income, and Time 1 score, Condition accounted for 11% of the variance in parents’ Time 2 score on Factor 1: Inaccurate Judgment ($R^2_{change} = .11$, $F_{change} = F(1, 219) = 59.67$, $p < .001$). Condition was found to be a significant predictor of parents’ ratings, accounting for 33% of unique variance in this Time 2 score ($t = 7.72$, $p < .001$, $sr^2 = .33$). Furthermore, results indicated that being in the Control Condition was associated with a .67 increase in Time 2 score compared to the Intervention Condition [B coefficient = .67 (95% CIs = .50 – .85)]. Higher scores on this measure indicate greater endorsement of this negatively framed factor (e.g., more risk).
Parents’ Beliefs Related to the Perception That Swim Lessons Reduce Children’s Need for Supervision (Factor 2: Supervision Not Needed)

After controlling for Child Age, Family Income, and Time 1 score, Condition accounted for 7% of the variance in parents’ Time 2 score on Factor 2: Supervision Not Needed \((R^2\text{ change} = .07, F\text{ change} = F(1, 218) = 21.42, p < .001)\). Condition was found to be a significant predictor of parents’ ratings, accounting for 26% of unique variance in this Time 2 score \((t = 4.63, p < .001, sr^2 = .26)\). Furthermore, results indicated that being in the Control Condition was associated with a .49 increase in Time 2 score compared to the Intervention Condition \([B \text{ coefficient} = .49 (95\% \text{ CIs} = .28 – .70)]\). Higher scores on this measure indicate greater endorsement of this negatively framed factor (e.g., more risk).

Parents’ Overall Beliefs Related to Drowning Risk, Water Safety, the Value of Swimming Lessons, and Parent Supervision (WSB Overall)

After controlling for Child Age, Family Income, and Time 1 score, Condition accounted for 17% of the variance in parents’ Time 2 overall beliefs about water safety \((R^2\text{ change} = .17, F\text{ change} = F(1, 219) = 106.44, p < .001)\). Condition was found to be a significant predictor of parents’ ratings, accounting for 42% of unique variance in Time 2 score \((t = 10.32, p < .001, sr^2 = .42)\). Furthermore, results indicated that being in the Control Condition was associated with a .56 increase in Time 2 score compared to the Intervention Condition \([B \text{ coefficient} = .56 (95\% \text{ CIs} = .46 – .67)]\). Higher scores on this measure indicate greater endorsement of the negatively framed items on the WSB Scale (e.g., more risk).

Parents’ Beliefs Related to Children’s Protectiveness Needs (Protectiveness)

After controlling for Child Age, Family Income, and Time 1 score, Condition did not account for a significant amount of variance in parents’ Time 2 ratings of children’s protectiveness needs \((R^2\text{ change} = .01, F\text{ change} = F(1, 213) = 1.81, ns)\). Condition was not found to be a significant predictor of parents’ Time 2 ratings \([t = -1.35, ns, sr^2 = -.07, B \text{ coefficient} = -.07 (95\% \text{ CIs} = -.17 – .03)]\).
Parents’ Beliefs Related to Children’s Supervision Needs (Supervision)

After controlling for Child Age, Family Income, and Time 1 score, Condition accounted for 5% of the variance in parents’ Time 2 ratings of children’s supervision needs around water \((R^2\text{ change} = .05, F\text{ change} = F(1, 213) = 17.35, p < .001)\). Condition was found to be a significant predictor of parents’ ratings, accounting for 22% of unique variance in Time 2 score \((t = -4.17, p < .001, sr^2 = -.22)\). Furthermore, results indicated that being in the Control Condition was associated with a .28 decrease in Time 2 score compared to the Intervention Condition \([B\text{ coefficient} = -.28 (95\%\ CI s = -.41 – -.15)]\). Lower scores on this measure indicate more risk in supervision beliefs.

2. Explore Parents’ Qualitative Experience of the S.A.F.E.R. Near Water Program Components

Parents in the Intervention Condition were asked a series of questions on the Time 2 questionnaire to evaluate: 1) how effective they believed S.A.F.E.R. Near Water was in communicating its intended messages, 2) whether they engaged with additional intervention components, and 3) how helpful they found the additional intervention components.

To What Extent Were the Main Messages From Parent Seminars Communicated to Parents?

Parents were presented with 13 items and asked to rate the extent to which each message was communicated in the Parent Seminar (range: 0 – 4, 0 = not at all, 4 = a great deal). Nine items were messages that the Parent Seminar specifically aimed to communicate. Four items were negatively framed and were either not communicated in Seminar or the opposite was communicated (to detect acquiescent responding). A mean score for each message item was calculated across all participants, with higher scores indicating more effectively communicated.

For the nine messages specifically communicated during Parent Seminars, parents’ mean scores ranged from 3.55 to 4.00 (see Table 10 for mean ratings associated with each item). Results suggest that messages related to the importance of supervision (Item 1: \(M = 4.00\), Item 12: \(M = 3.55\)), young children’s vulnerability for
drowning/circumstances of child drownings (Item 2: \( M = 3.79 \), Item 3: \( M = 3.87 \), Item 5: \( M = 3.91 \), Item 6: \( M = 3.78 \), Item 9: \( M = 3.64 \), Item 10: \( M = 3.80 \)), and the belief that swim lessons do not “drown-proof” young children (\( M = 3.92 \)) were well communicated.

Parents’ ratings also reflect an appropriate lack of communication of the four negatively framed items where the reverse of the message item was communicated during Parent Seminars (range = .33 to .54). For example, the mean score for ‘Young children have acquired the skills necessary to save themselves from drowning’ was .40, and the message directly communicated during Seminar was that young children have not acquired these necessary skills.

What was Parents’ Experience of, and Level of Engagement With, the Parent Seminars?

To determine how memorable the Parent Seminars were considered to be, participants were asked to rate how often they had thought about the content (oral presentation, video) since attending (range: 0 – 4, 0 = not at all, 4 = very often). Results revealed that parents thought of the material some of the time/fairly often (\( M = 2.16 \), \( SD = 1.00 \)). Eighty six percent of parents indicated ‘yes’ that they had told or talked to someone about the Seminars (e.g., about something that they found interesting or did not know before). Furthermore, 96% of parents indicated that they did not know about the Swim to Survive Standard (e.g., Roll into deep water, Tread water for one minute, Swim 50 metres) prior to attending sessions.

Parents were also asked questions assessing the extent to which they engaged with the take-home materials from the Parent Seminars. Seventy-six percent of parents responded that they had read both handouts, 14% that they read the handout from Session #1 only, and 10% that they did not read either handout. Parents who read both handouts (\( n = 68 \)) appeared to find these moderately helpful (\( M = 2.94 \), \( SD = .91 \); range: 0 – 4, 0 = not at all helpful, 4 = very helpful). Parents were also provided with a handout listing the websites where they could access original source material used in the Parent Seminar videos, and 9% indicated having visited at least one of these links.
To What Extent Were the Main Messages From the Posters Communicated to Parents?

Parents were presented with 10 items and asked to rate the extent to which each message was communicated by the posters that were displayed at their child’s swim school (range: 0 – 4, 0 = not at all, 4 = a great deal). Seven of the 10 items were messages that the posters specifically aimed to communicate. Three items were negatively framed and were either not communicated or the opposite was communicated (to detect acquiescent responding). A mean score for each item was calculated across all participants, with higher scores indicating more effectively communicated.

For the nine items specifically communicated by the posters, parents’ mean score ranged from 2.87 to 3.33 (see Table 11 for mean ratings associated with each item). Results suggest that messages related to the importance of supervision (Item 1: $M = 2.96$, Item 4: $M = 3.41$, Item 8: $M = 3.33$) and about young children’s vulnerability for drowning/circumstances of child drownings (Item 2: $M = 2.87$, Item 5: $M = 2.88$, Item 7: $M = 3.27$, Item 9: $M = 3.06$) were communicated fairly well, but to a lesser extent than was achieved by Parent Seminars for which ratings were higher. As expected, parents’ poster ratings reflected a lack of communication of the three negatively framed items, where the message was not communicated in the poster (range = .49 to .69).

What was Parents’ Experience of, and Level of Engagement With, the Posters?

When asked how effective (range: 0 – 4, 0 = not at all effective, 4 = very effective) the posters were considered to be in grabbing their attention and making them stop to read them, parents appeared to provide moderate ratings ($M = 2.19$, $SD = 1.21$). Thirty five percent of parents indicated ‘yes’ to having told or talked to someone about the posters (e.g., the images and/or messages).
To What Extent did Parents Acquire Knowledge of the Material That was Presented During Parent Seminars?

Before and after each Seminar, parents completed a short multiple-choice survey consisting of questions directly related to the material that was presented during Seminars (see Appendix F, G, H, and I for pre and post knowledge surveys). For each survey (pre and post, for Seminars #1 and #2), parents received an overall score reflecting the percent of correct responses they endorsed. For questions that required more than one answer (e.g., ‘check all that apply’), parents received a score that ranged between 0 and 1 (e.g., if 2/3 correct = .67).

To evaluate whether there were increases in parent knowledge from before to after the Seminars, repeated measures ANOVA were conducted separately for each Seminar on the percent of correct responses parents endorsed. A qualitative examination of the number of correct responses for each item was also performed, with the aim of identifying topic areas that were well communicated and those that may have been less effectively communicated.

Parent Seminar #1

A repeated measures ANOVA using time (2: pre, post) as the within-subjects factor was conducted on the percent of correct responses parents endorsed on the knowledge survey. Results revealed a significant increase in correct responses from before ($M = 68.48\%, SD = 14.28$) to after ($M = 95.40\%, SD = 7.09$) participating in the Seminar, $F(1, 88) = 299.06, p < .001$.

See Table 12 for the number and percent of correct responses for each item (see Appendix F and H for pre and post knowledge surveys for Seminar #1). Qualitative examination of items suggests that parents acquired much of the knowledge presented during Seminars, with the total percent of correct responses for individual items ranging from 72% to 100%.

Additionally, parents were asked to rate how important, engaging, and emotionally arousing they found the Seminar (range: 1 – 7, 1 = not at all, 7 = extremely). Results suggest that parents believe the material presented was highly
important ($M = 6.48, SD = .64$). They also rated the Seminar as having held their interest and attention ($M = 5.62, SD = 1.08$) and to be impactful on their emotions ($M = 5.37, SD = 1.16$).

**Parent Seminar #2**

A repeated measures ANOVA using time (2: pre, post) as the within-subjects factor was conducted on the percent of correct responses parents endorsed on the knowledge survey. Results revealed a significant increase in correct responses from before ($M = 59.62\%, SD = 14.91$) to after ($M = 83.37\%, SD = 11.87$) participating in the Seminar, $F(1, 90) = 275.54, p < .001$.

See Table 13 for the number and percent of correct responses for each item (see Appendix G and I for pre and post knowledge surveys for Seminar #2). Qualitative examination of items suggests that parents’ acquired knowledge was somewhat more variable compared to results from Parent Seminar #1, with the total percent of correct responses for individual items ranging from 44\% to 99\%. It appears that intervention messages (or alternatively the framing of the questions on the knowledge survey) about children’s vulnerability drowning (Item 3: why children are at particular risk) and the importance of considering how children’s developmental stage relates to drowning prevention (Item 6: most important factor in deciding if children are able to ‘swim’ and keep themselves safe in the water) could have been communicated with greater clarity.

Parents rated how important, engaging, and emotionally arousing they found this Seminar (range: 1 – 7, 1 = not at all, 7 = extremely). Results suggest that parents believe the material presented was highly important ($M = 6.56, SD = .60$). They also rated the Seminar as having held their interest and attention ($M = 5.65, SD = .80$) and to be impactful on their emotions ($M = 5.21, SD = 1.10$).

**Discussion**

**Background and Rationale for the Current Study**

Worldwide, the highest rates of drowning occur in children under the age of five (WHO, 2014). Similarly, in Canada, preschool aged children comprise an at-risk
group (Drowning Prevention Research Centre Canada for the Lifesaving Society, 2016). A factor that has been consistently associated with drownings in preschool aged children is adult supervision, with many drownings occurring when supervision is inadequate (e.g., during short lapses). As such, adult supervision is widely recommended as a prevention approach against child drowning (e.g., National Drowning Prevention Alliance’s Education Committee, 2009; WHO, 2017), and it is recognized that preschool aged children require constant, focused, arms’ length supervision when they are in and around water (Committee on Injury, Violence, and Poison Prevention, 2010; Nguyen et al., 2003). Despite this, parents have been shown to demonstrate mistaken beliefs about drowning risk and the level of supervision required to keep young children safe around water (e.g., Moran, 2009; Morrongiello et al., 2013b). Past research has also shown that parents with preschool aged children enrolled in swimming lessons may be vulnerable to holding optimistic beliefs about the protective role of the skills learned in swim lessons, and, in turn, to believing that less adult supervision of children is required (Morrongiello et al., 2013b).

Importantly, there are few intervention studies conducted with parents of preschool aged children in swim classes and that specifically aim to enhance beliefs relevant to supervision, drowning risk, and the role of young children’s swim lessons. One exception is Moran and Stanley’s (2006b) ten-week parent-focused education program that successfully targeted parental beliefs relevant to supervision, safety, and the tendency to overvalue the protective function of lessons. Nonetheless, the program involved ten weeks of participation, which is demanding for a lot of parents. Building on Moran and Stanley’s (2006b) promising findings, and to address a critical gap in the literature and offer a shorter parent-focused program, the current study implemented a water safety intervention to parents with children aged two through five enrolled in swim lessons.

**Overview of S.A.F.E.R. Near Water Program Findings**

The *S.A.F.E.R. Near Water* program applied relevant behaviour-change theory and research to the development of intervention materials. Program components were
tailored to the scope of the child drowning problem in Ontario, Canada, and to the unique risks and developmental considerations for children between two and five years of age. The current study also aimed to evaluate S.A.F.E.R. Near Water, as evaluation and monitoring are key activities to determining program efficacy (WHO, 2017). In general, the outcome variables aimed to measure: 1) parents’ intentions to supervise their own child across a variety of common social x water contexts; 2) parental judgments related to drowning risk, water safety, the value of swimming lessons, and parent supervision; 3) parental perceptions suggesting inaccuracy of judgment and optimism bias; 4) parental judgments regarding children’s supervision and protectiveness needs; and 5) parental perceptions of their child’s swim competence. In general, findings indicate that those receiving S.A.F.E.R. Near Water reported behavioural intentions reflecting closer supervision of their own child around pools, lakes, and beaches, as well as when alone, with friends, and with adults present. Parents in the Control Condition demonstrated greater inaccuracy in their judgments related to children’s swim skill and drown-risk, and greater optimism bias related to the perception that swim lessons reduce children’s need for supervision. Control parents also demonstrated more risk in their beliefs related to drowning risk, water safety, the value of swimming lessons, and parent supervision. Overall, therefore, the program proved quite successful.

Condition was not found to be a significant predictor of parents’ perceptions of children’s protectiveness needs. This may suggest an area to focus on for future intervention efforts. It is also worth noting that this score had the greatest impact of non-independence for the Intervention Condition at Time 1 (DEFF = 2.89), so clustering may have had an undue impact on this score and, thus, the results. It was also found that Condition did not significantly predict parents’ perceptions of their child’s swim competence. However, it was not expected that participation in S.A.F.E.R. Near Water would impact parental ratings of children’s swim competence, so this variable was included as a ‘control’ one in the study to confirm the specificity of any positive changes shown by parents in the Intervention Condition. The fact that
Condition was not a significant predictor of swim competence ratings, but did predict other parental risk and supervision beliefs that S.A.F.E.R. Near Water targeted, lends further support for the program’s efficacy.

Consistent with the positive outcome effects obtained in the Intervention Condition, parents generally demonstrated increased knowledge after participating in the Seminars compared to what their knowledge level was assessed to be before. Furthermore, evaluation data suggest that most messages presented in S.A.F.E.R. Near Water through Seminars and posters were effectively communicated. These included Seminar messages related to: the importance of supervision, young children’s vulnerability for drowning/circumstances of child drownings, and the belief that swim lessons do not “drown-proof” young children. The poster messages related to supervision and children’s vulnerability for drowning were also communicated, but to less of an extent than the Seminars. This may be related to the fact that poster messages were first communicated to parents during Seminars, so they were already aware of the message that was being reinforced by the poster. This could also be related to the finding that parents reported a lower level engagement with the posters compared to the Seminars. This may not be particularly surprising given the conditions associated with how messages were delivered and received. The Seminars provided a dynamic, multi-media presentation of information in a quiet setting, and parents’ attendance was planned and deliberate. The poster communications were more passive, and required parents to process the messages while also balancing other competing demands to their attention that may have been present at the pool.

**The Impact of Seminar Presentations**

Furthermore, the Seminar presentations included video content that specifically aimed to target parents’ emotions through injury testimonials, which the posters did not do. While the current study did not examine the extent to which the injury testimonials specifically achieved this, parents did rate the Seminars overall and found these both to be fairly/very emotionally arousing. Focus groups conducted with mothers on their reactions to a video-based intervention for preventing young
children’s in-home injuries suggested that emotionally impactful content is appreciated to communicate messages about how severe injuries can be (Morrongiello et al., 2009b). Parents have been shown to be able to relate (Girasek, 2011; Morrongiello et al., 2009b) to the emotional experiences of those providing child-injury story testimonials, which may represent a mechanism through which parents in the current study were able to engage and connect with the material presented. This was not explicitly measured in the current study, and an area for future enquiry could be to investigate parents’ state mood in response to such drowning story testimonials to further elucidate this possibility.

Narratives and story telling have also been successfully applied as ‘knowledge translation’ strategies in the promotion of healthy behaviours, and the video format is a valued avenue for delivering stories (Smith, Tomasone, Latimer-Cheung, & Martin Ginnis, 2015). Furthermore, injury story testimonials have been considered wake up calls for parents (Morrongiello et al., 2009b). It is possible that the S.A.F.E.R. Near Water Seminars may have been considered as such by parents, encouraging them to later reflect on the messages communicated and on their supervision practices. Such an interpretation would be consistent with the fact that most parents (86%) reported having told or talked to someone about an aspect of the Seminars (e.g., something they learned or had not known). Manganello, Falisi, Roberts, Smith, and Mackenzie (2016) found that 35% of mothers with children under the age of six seek information about injury prevention from family and friends, suggesting that discussion with important others is appreciated as a safety related resource. Discussing the Seminar content after participation represents an additional layer of engagement with the material, and may be related to why Seminars appeared to have a greater impact than the posters.

**Engagement With Take-home Materials**

**Informational Handouts**

Importantly, many parents (76%) reported that they read both informational handouts that were provided at the end of each Seminar, and appeared to find these moderately helpful. Educational handouts can serve to extend a learning opportunity,
so it is promising that most parents reported to have engaged with this material. The informational handouts likely also served as reinforcement and prompting of the key messages communicated during Seminars. In De Leon, Fuentes, and Cohen’s (2014) systematic review, it was found that health related interventions using ‘periodic message prompting’ reported significant, and favourable results across a variety of health behaviours in the short term (De Leon et al., 2014). Results from this review also revealed that information provided through message prompting is valued by recipients, and that the way in which information is delivered did not influence the likelihood of the intervention affecting change in targeted behaviours, though prompting through printed materials was the second most commonly used method (De Leon et al., 2014). Prompting that offers targeted strategies and feedback is also beneficial (De Leon et al., 2014). Based on these findings, therefore, the role of the informational handouts in promoting closer parental supervision may have been enhanced through the provision of specific supervision strategies.

The Role of Tailoring Intervention Materials

Engagement with the take-home handouts may also be related to the messages being specifically tailored to parents with young children in swim lessons. One tailoring approach is to present material in a personally relevant way (Rimer & Kreuter, 2006), and tailoring can also involve targeting specific constructs (e.g., beliefs, perceptions) thought to have an impact on behavioural outcomes (Hawkins, Kreuter, Resnicow, Fishbein, & Dijkstra, 2008). Accordingly, many tailored communications targeting health behaviour apply health behaviour change theories (Kreuter, Strecher, & Glassman, 1999). Tailoring at the individual level was beyond the scope of, and not possible for, the current study, though materials were tailored to the extent possible (e.g., to the developmental stage of two to five year-old children, the experience of parents supervising children around water, to target specific beliefs based on theory and past research).

While tailoring can be applied to intervention materials in many formats (and was for the current study), material in printed format has been highly used and
studied (Rimer & Kreuter, 2006). In discussing printed materials, Kreuter and colleagues (1999) state that tailoring may be applied to evoke: “(a) greater attention; (b) greater comprehension; (c) greater likelihood of discussion of the content with others; (d) greater change in cognitive behavioral mediating constructs addressed by the content; and (e) greater likelihood of behavior change” (pp. 278). These factors were all considered as motivation for tailoring S.A.F.E.R. Near Water informational handouts (as well as other program components). A meta-analysis of tailored, print-based intervention materials supports the efficacy of tailored messages when compared to non-tailored messages (Noar, Benac, & Harris, 2007). Tailoring print materials based on theoretical constructs has been found to be associated with a greater effect sizes (Noar et al., 2007), which supports the current study’s application of theory to the informational handouts. While letters are a common form of print-based tailored materials, intervention studies with the largest effect sizes were those that utilized pamphlets/leaflets and it has been suggested that this might be related to images on the materials (Noar et al., 2007). Extending these findings to the current study, it may be worthwhile to explore in future the impact of incorporating images from the posters with messages from the handouts.

**Use of Online Resources**

In the current study, few parents (9%) indicated visiting the websites provided to access the original video material from which clips were obtained for use in the Seminar videos. While the Internet has been shown to be a highly favoured way to access information about a variety of injury prevention topics (Manganello et al., 2016), it may be that parents in the current study did not feel the need to visit these websites for more information given the amount they had already received during the Seminars. The websites were provided in list form, and as a resource if parents so wished for elaboration upon what was presented during Seminars. It is possible that engagement with website material may have been enhanced if a description of the links had been provided to highlight what parents could expect to gain if they were to visit these. Past research has also demonstrated that engagement with digital health
interventions (DHIs) can be impacted by practical considerations such as being busy with personal affairs or other events (O’Connor et al., 2016), and it is conceivable that parents in the current study did not feel they had time to explore the links. Furthermore, there is some research to suggest that participation with tailored web delivered programs may be less than other types of face-to-face programs (Northouse et al., 2014), which may also relate to why few parents went online for content as a follow up to the Seminars.

Given that most parents read the S.A.F.E.R. Near Water handouts may also lead one to consider whether engagement with the take-home materials may be related to the amount of effort required to access information. The list of websites was provided as a paper handout, so in order for parents to access the video content, they were required to type the website into their Internet browser. If parents viewed this as being too effortful or cumbersome, they may have been less likely to enact this step. Future research could explore the possibility of providing these websites via email, so parents could click on, rather than type in, a link, as a way to ease their access to the material. In addition to the Internet, mobile devices represent another medium though which information can be delivered and accessed easily. Hossain and colleagues (2015) have proposed an intervention for parents with children under the age of five whereby drowning prevention materials will be disseminated to mobile devices through text messages, pictures, audio, and visuals. This multi-modal delivery of information seems to be a promising approach. It is also worth considering issues surrounding the need to balance benefits of using advancing technology with potential risks associated. For example, a review of the use of smartphones in the area of health promotion revealed that while the possibilities associated with these technologies may be promising, caution should also be exercised in assessing potential downfalls and dangers associated with use (Bert, Giacometti, Gualano, & Siliquini, 2014), including that these can distract parents from attending to their children.
Implications

Using the ‘Teachable Moment’ to Communicate Program Messages

The importance of delivering educational interventions in an appropriate context has been acknowledged (Leavy et al., 2016), and the decision to implement S.A.F.E.R. Near Water Seminars on site during swim lessons was specifically grounded in the intention to create a ‘teachable moment’ for parents and enhance their attention towards drowning prevention messages. In Lawson and Flocke’s (2009) analysis of the concept of a teachable moment, the most typical use of this term across the literature is to denote an opportune moment to bring about change. The swim lesson facility is thought to be a favourable physical context for delivering safety information relevant to swimming and drowning risk. Importantly, teachable moments can be created and co-created (Lawson & Flocke, 2009), a concept consistent with Glascoe and Trimm’s (2014) discussion of the ways in which communication during physician visits can create teachable moments and enhance parent education. A learning opportunity may thus have been created through S.A.F.E.R. Near Water message framing, as well as through the shared educational interaction between facilitator and parents during Seminars. Lawson and Flocke (2009) discuss teachable moments and their relation to the Health Belief Model, contending that co-created teachable moments may also serve as cues to action that can then be explored within the interpersonal interaction. The Seminars provided parents with suggestions about how to more closely supervise their children, and these suggestions may have served as cues to action. While timing constraints prevented discussion opportunities during Seminars, future programming that is more interactive could explore the potential for further co-creation of teachable moments as cues to action.

While the extent to which a teachable moment was achieved in the current intervention may be unknown, it is worth highlighting that, overall, parents rated the material presented at both Seminars as being highly important, to have held their interest and attention, and to have been impactful on their emotions. This implies a level of parent receptivity toward the Seminars, which may lend support to the
perceived quality of the Seminar components. This would also suggest that parents were engaged with the material, a factor considered important to one’s level of receptivity to information. This increased receptivity may also be related to tailoring effects, as tailored programs have been rated as holding greater interest (Oenema, Tan, & Brug, 2005), and have consistently been associated with encouraging health related outcomes (de Vries, Kremers, Smeets, Brug, & Eijmael, 2008; Kreuter et al., 1999; Kroeze, Werkman, & Brug, 2006; Lustria et al., 2013; Noar et al., 2007). It was not possible in the current study to provide tailored feedback (Kroeze et al., 2006; Lustria, Cortese, Noar, & Glueckauf, 2008; Soetens, Vandelanotte, de Vries, & Mummery, 2014), which has been used, for example, as a key component in many computer/web based intervention studies, and can provide increased opportunities for individualization of material. An area for future research may be to explore the potential for feedback opportunities for parents, perhaps based on unique supervision challenges associated with their child’s developmental stage. This feedback could also build more upon relevant theoretical constructs tailored towards the individual needs of a parent (e.g., perceived barriers, developmental vulnerabilities). Video based, tailored intervention feedback has been found to be favoured over other web based delivery methods that included text or text and video (Soetens et al., 2014), which may suggest a potential area to explore in future for feedback about supervision and drowning prevention.

**Applying a Developmental Framework to Intervention Components**

The need for considering child development issues in devising injury prevention programs targeting parents is increasingly recognized as important in the field (Morrongiello & Schwebel, 2017). *S.A.F.E.R. Near Water* applied a developmental framework to communicating drowning prevention messages. A main goal of *S.A.F.E.R. Near Water* was to promote in parents a greater understanding of the ways in which normative developmental factors can increase young children’s drowning risk, and to build on this by highlighting ways in which effective adult supervision can minimize this risk. In addition to providing parents with developmentally
appropriate strategies for enhancing supervision, the S.A.F.E.R. acronym (Supervise by Always being Focused on the children and able to Extend your arms and Reach them) was consistently reinforced during Seminars and on posters. Parents’ short-term retention of this acronym was excellent, with 99% correctly identifying this after it was presented during the Seminar.

Understanding Swimming Competency Within a Developmental Drowning Context

Topics that have received considerable attention in the water safety literature include how best to operationalize ‘swimming’, and whether there is a preferred or appropriate age for children to begin learn-to-swim lessons. More recent literature, however, highlights what may be a more pertinent question: how do the competencies that are taught in learn to swim type programs relate to drowning prevention, and how do these competencies differ based on one’s developmental stage? In fact, there has been extensive advocacy in the swimming and drowning prevention community around such questions.

It has been suggested that the focus of swim lessons has moved away from drowning prevention toward a greater emphasis on stroke development (Quan et al., 2015). In response, many experts in the field have advocated for conceptualizing water competency by focusing on how water skills relate to drowning prevention, rather than by adopting a less encompassing approach that focuses on swim strokes and the distance one can achieve (Quan et al., 2015; Stallman, Haugen, & Kjendlie, 2011). Based on an extensive survey across programs and organizations, the American Red Cross Scientific Advisory Aquatics sub-council has suggested a definition of water competency that addresses, with specificity, the minimal skill set requirement for surviving and being safe around water, highlighting that skills need to be developed in different water contexts (Quan et al., 2015). These are critical considerations, particularly because it has been consistently cited that the water skills learned/acquired in one environment may not necessarily transfer to others (Langendorfer 2011, 2015; Kjendlie et al., 2013; Quan et al., 2015; Stallman, 2011a;
Wallis et al., 2015). Water performance can be negatively impacted by clothing, particularly amongst those whose water competency is less (Moran, 2014), and people may underestimate the level of effort it takes to perform water safety activities in clothing (Moran, 2015). Preschool aged children would seem to be at particular risk as they may experience unexpected falls into the water, be fully clothed, or experience panic and be unable to implement skills they have.

**The Role of Educating Parents About the Swim to Survive Standard**

*S.A.F.E.R. Near Water* aimed to incite in parents a more realistic appraisal of young children’s drowning risk by addressing key issues related to how swimming and water competence are conceptualized, and how these terms can be understood with a drowning prevention context. Parents may be unaware of when their children have acquired the necessary skills for preventing drowning, which points to the important role of educating parents about when this competency has been achieved (Quan et al., 2015). The Lifesaving Society’s Swim to Survive program teaches the three basic skills considered essential to survive an unexpected fall into deep water (e.g., roll into deep water, tread water for one minute, swim 50 metres). These three skills were a key educational component of *S.A.F.E.R. Near Water* to provide parents with a developmental skills benchmark in a drowning prevention context. In fact, the Swim to Survive Standard was based on the circumstances of drowning in Canada (Bueschleb, 2011), and these competencies appear to translate well onto the foundational skills necessary to prevent drowning as outlined in other sources (Stallman, 2011c). In the current study, 96% of parents indicated that they did not know about the Swim to Survive Standard prior to attending the Seminars.

**The Complexity of Understanding Swimming Competency Within a Developmental Drowning Context**

*S.A.F.E.R. Near Water* consistently communicated the message that swim lessons are not an adequate prevention technique in isolation (i.e., they are not a substitute for supervising). Langendorfer (2011) highlights that swimming skills on their own cannot be expected to protect against drowning, and advocates instead for a
more integrative view privileging a developmental and ‘dynamical’ framework. Langendorfer (2011) also acknowledges that swimming or water competence are affected by variables at many levels, and the interactions among them. This comprehensive view of water competence is complementary to Developmental Psychology’s view of child development: children’s physical, cognitive, and emotional development is constantly changing (dynamic), may vary depending on context, and is impacted by a broad array of factors (e.g., individual, familial, community, societal) and the interrelationships among the factors.

This reconceptualization of swimming and water competence, and placing these concepts within a developmental drowning prevention context, represents both a cultural and pedagogical shift. This may in fact be related to how parents have historically perceived lessons, valuing length based estimates as determinants of swim skill, and assuming that young children are learning how to ‘swim’ in their lessons. To challenge this perception, S.A.F.E.R. Near Water suggested that preschool aged children are more realistically learning how to be comfortable and familiar in the water, rather than how to swim per se. While S.A.F.E.R. Near Water appears to have successfully communicated much of its content, the message “What factor is most important in deciding whether a young child is able to ‘swim’ and keep themselves safe in the water?” was not considered to be adequately acquired by parents. Only 44% of parents correctly answered “Developmental stage of the child, and how their water skills relate to drowning prevention” at the end of the Seminar. It is also noteworthy that fewer parents correctly answered this question after the Seminar compared to before. It is possible that the low percentage of correct responses could be related to a lack of clarity in the question framing or wording, but this may also point to an important area to build upon for improving intervention messaging. On reflection, this is a complex message to fully grasp, and, accordingly, has been widely studied among experts across disciplines.

For parents to internalize the idea that water competence needs to be placed within a developmental, drowning prevention context, repetition, elaboration, and
discussion about messages will likely be required. Importantly, parental understanding of this concept has important implications for how they supervise young children around water. If parents are able to achieve a more accurate appraisal of what it is their child is learning in lessons, and if they come to understand how this relates to young children’s ability to secure their own safety (e.g., preschoolers do not have the developmental capabilities to prevent themselves from drowning), then parents would be expected to be more likely to see the protective value of close adult supervision. While the specific message item “What factor is most important in deciding whether a young child is able to ‘swim’ and keep themselves safe in the water?” had limited retention, the fact that parents in the Intervention Condition demonstrated less risk in their beliefs relevant to optimism bias, drowning risk, and supervision, and acquired many messages related to children’s developmental vulnerabilities, suggests that program messages related to this idea were more broadly retained to some extent.

**Summary of S.A.F.E.R. Near Water Program Findings, and Extensions for Future Evaluation Efforts**

Overall, results indicate that the S.A.F.E.R. Near Water program was well received by parents, associated with increased knowledge of the topic areas conveyed during Seminars, and effective in targeting parental perceptions related to adult supervision, children’s drowning risk, water safety, optimism bias, and accuracy of judgments related to swim competence and risk. These findings support the potential use of an easy to administer, multimedia water safety intervention for parents of young children enrolled in swim lessons. Moreover, the fact that the program could be delivered, and comparable positive results were obtained, in private and public swim facilities, increases the potential reach of the program. The current findings support past research suggesting that a community based, educational intervention delivered using a short (30 minute) multimedia format to mothers of children under the age of five can be effective to increase knowledge related to the prevention of drowning and the importance of supervision (Silva et al., 2016). Parent testimonials...
about child drowning fatalities (e.g., written ‘case studies’) have been used to convey information about the importance of supervision (WHO, 2017), and video testimonials have also been used to successfully target knowledge of drowning risk (Shen, Pang, & Schwebel, 2016), as well as to influence parent perceptions of children’s injury risk (Morrongiello et al., 2009b).

*S.A.F.E.R. Near Water* was developed with the specific aim of being a multifaceted intervention; that is, program activities were intended to be complementary, and to reinforce messages using different medium with the goal of increasing engagement with material. Each of the components is thus considered to have contributed in some way to the program’s overall success. It was beyond the scope of evaluation efforts to ascertain the impact of *S.A.F.E.R. Near Water*’s individual components, and the mechanisms through which each may have contributed to the program’s effects. However, this is an interesting avenue to explore in future research. It is thought that a key element in *S.A.F.E.R. Near Water* was the approach taken in Seminars whereby video content was combined with an oral presentation delivered by a facilitator, though the effects of this were not measured in a systematic way. The potential for a teachable moment to have been created when parents viewed the video testimonials, and then co-created through the face-to-face interaction with a facilitator, may have contributed to the development of a shared interpersonal space where engagement and learning could occur. The swim lesson setting is also considered to be a suitable contextual space for delivering a program about children’s water safety and drowning risk, and this may have contributed to creating a learning environment where parents were open and receptive to this kind of information. Future research could investigate these and other related possibilities by exploring parents’ views on which aspects of the Seminars they found most helpful (e.g., content areas, modes/location of delivery), as well their reflections of their experience during the Seminars (e.g., mood, reactions to potential interpersonal dynamics that they may have noticed).
Additionally, a main focus of this dissertation involved determining how best to frame and deliver program messaging, and it is thought that the decision to apply both theory and research to guide these decisions played an important role in the program’s positive outcomes. Interventions that draw specifically on behavioural theories have been found to have an encouraging impact on drown-risk related knowledge (Shen et al., 2016). In general, it has been noted that few interventions aimed at preventing child drowning apply behavioural theories (Leavy et al., 2016), though it is promising that studies have been proposed to evaluate drowning prevention messages that map onto theoretical targets from health behaviour theories (Denehy, Crawford, Leavy, Nimmo, & Jancey, 2017). While the current study also aimed to deliver messages mapping directly onto theoretical constructs, it was beyond the scope of this project to evaluate the relative influence of these messages on parental outcome ratings. Determining which types of theory-driven messages are most impactful could be a productive area to explore through future work.

**Directions for Future Research**

**Increase Opportunities to Reinforce Messages**

Given that understanding water competence within a developmental drowning context is multifaceted, and possibly a novel concept to parents, it would likely be helpful to continually reinforce this message. This could be done through supplementary parent Seminars, additional take-home materials, or possibly through the use of technology. Efforts to educate parents on water safety have been attempted through mobile applications (Quan et al., 2015), and community wide interventions that use mobile devices have been proposed for targeting drowning related knowledge, perceptions, and behaviours amongst parents of young children under the age of five (Hossain et al., 2015). Additionally, asking parents directly about what they would find helpful could be an effective way of determining how best to reinforce messages.

Given the individual variability in children’s developmental capabilities, it could be valuable for future intervention efforts to provide more opportunities for
discussion during in-person seminars. This may also promote an empowering and collaborative environment amongst parents, and increased opportunities for parents to share experiences and supervision tips with one another. Given the time constraints and manualized nature of this program, this was not possible and beyond the scope of the current study. Increased opportunities during sessions for parental reflection and feedback from a trained moderator may also be helpful. Multi-dimensional training and learning materials that apply a broad range of techniques (e.g., role playing, self-learning, those privileging an interactive element) have been used for rescue and resuscitation training (WHO, 2017). It may be worthwhile for future educational supervision interventions to explore more active communication techniques, which may further enhance parental engagement and appeal to an even greater variety of learning styles. It may also be helpful for future efforts to implement ‘booster sessions’ to reinforce program messaging. These sessions could take place during subsequent swim lesson periods, with material tailored to the unique vulnerabilities that present as children age and progress through lessons. Booster sessions could also provide additional evaluation opportunities to elucidate whether the positive findings associated with S.A.F.E.R. Near Water have a lasting impact.

Consistent with suggestions from the WHO (2017) drowning prevention implementation guide, S.A.F.E.R. Near Water was an evidence-based program, with both practical and theoretical content, and recent information. It is recommended for educational interventions implemented in the future to update content according to new research and media available. Though interestingly, it has been found that while the way in which information is communicated is changing rapidly with technology (e.g., the Internet), many messages within the field of drowning prevention remain relevant over time (Connolly, 2011).

**Explore Generalizability of the Program With a More Diverse Parent Group**

Given that the current sample was relatively homogenous with regards to income, education level, and ethnicity, it would be helpful for future research to explore the applicability of the program, and generalizability of results, to a more
diverse group of parents. This seems particularly important given that drowning risk is greater in areas with fewer resources, and amongst those with lower education and income levels (WHO, 2014). In addition, drowning risk can vary based on ethnicity, with higher risk reported amongst Indigenous people in Canada (Drowning Prevention Research Centre Canada for the Lifesaving Society, 2016) as well as amongst those who are new to Canada (Lifesaving Society, 2011, 2016). Future efforts should ensure that program messaging applies to the intended target group, as perceptions of water safety may be impacted by one’s cultural beliefs and experiences with water. Messaging may need to be adapted to maintain cultural sensitivity, and to accurately reflect the scope and burden of drowning in the community where the program will be delivered. This is expected to promote generalizability of the program, and to assist in reaching other vulnerable groups with relevant water safety information.

**Increase Opportunities for Collaboration Within the Water Safety Community**

The current study demonstrated that it is feasible to incorporate parent education programming alongside children’s learn to swim lesson programming, and this can occur in private as well as public swim lesson settings. This is considered to be an important finding, and highlights the potential for integrating parent water safety education into children’s swim lesson programming. It may be beneficial for future research to explore the possibility of implementing *S.A.F.E.R. Near Water* alongside children’s swim lessons in other facilities and communities. This would allow for investigation on the feasibility of broader program dissemination efforts. This may also help to determine how best to integrate parent education with children’s swim lessons, as well as potential barriers to implementation (and how to overcome these) in other aquatic facilities.

Designated ‘water safety presentation days’ may be other opportunities to deliver programming to a greater number of people at once. Furthermore, swim-based community organizations may be able to reach a wider audience with drowning prevention messages if programming is integrated into existing water safety efforts.
Linking parent education programs to broader drowning prevention initiatives may also present additional opportunities for teachable moments to be created. For example, the Lifesaving Society’s National Drowning Prevention Week takes place during the third week in July. Many of the messages communicated during this week (Lifesaving Society, 2017a) are consistent with those presented in *S.A.F.E.R. Near Water*, including: the need for children under the age of five to be within arms’ reach of an adult supervisor (*Within Arms’ Reach*, pp. 5); the utility of families learning the key skills necessary to be better prepared to survive an unexpected fall in to deep water (*Family Swim to Survive*, pp. 7); and the importance of supervising closely around backyard pools, a common locations of child drownings (*Backyard Pool Safety – Watch Me Not Your Phone*, pp. 8). Collaboration is recommended to communicate drowning prevention messages that are strategic and consistent (WHO, 2017). The current project can attest to this, as the Lifesaving Society’s materials have been critical to helping the author reinforce messages consistent with national and provincial initiatives.

**Consider Broadening Intervention Targets and Increasing Integration**

Most programs aimed at promoting water safety for the under-five age group focus on the parent as the recipient of information. It is Robinson’s (2011) conviction that drowning prevention efforts that target young children also are needed. Robinson (2011) believes that rather than communicating information using fear, programs for children under five should present messages that are consistently positive. A drowning prevention program for preschool-aged children has been proposed featuring a lion cub who communicates safety messaging in a scaffolded, developmentally sensitive way through stories (Robinson, 2011). It is advocated that through messages tailored to young children’s level of understanding, and to the ways in which they make sense of the world around them, children will learn (and build into their internal structure) how to interact more safely with water, while still gaining a sense of joy from their water experiences (Robinson, 2011). This approach considers the young child as an active agent in change, and reminds readers about the
importance of joy and positivity in the lives of children. As such, this program may be an encouraging layer of protection. However, given children’s developmental vulnerabilities, and that preschool-aged children rely on adults for safety around water, prevention efforts would be remiss not to also target caregivers. Accordingly, it may be worthwhile to explore in future the possibility of implementing child-centred programming alongside parent-focused education.

**Consider Incorporating an Observational Component to Program Evaluation**

Another area for future research could be to directly observe parents’ supervision behaviours before and after participation in S.A.F.E.R. Near Water. This program was intended to target parental beliefs and behavioural intentions, which theory suggests would be expected to impact the likelihood of enacting behaviours. It could be productive to elucidate the extent to which S.A.F.E.R. Near Water may have, in turn, impacted behaviour, and also whether there is convergence between parents’ reports and their actual supervisory behaviours.

**Study Limitations**

**Type of Data Collected**

Many interventions in the field of drowning prevention lack longer-term follow-up/evaluation efforts (Leavy et al., 2016; Wallis et al., 2015), and this is noted as a limitation in the current study as well. Given that outcomes for this project were evaluated at two time points (pre and post intervention), the extent to which change could be investigated was somewhat limited, and would be more thoroughly explored within a longitudinal study design. It was beyond the scope of this project to explore parents’ retention of program messages over time, or to explore whether the positive impact of the intervention persisted beyond the study period. However, these would be important areas to explore for future research.

Another limitation cited amongst drowning prevention studies is that they heavily use self-report data (Wallis et al., 2015) and may be vulnerable to test-retest bias (Shen et al., 2016). The focus of analysis for the current study was on parental perceptions and behavioural intentions, and whether changes in beliefs were
associated with participation in S.A.F.E.R. Near Water. Therefore, self-report data using a pre-post design was deemed appropriate, but this is acknowledged as a potential source of bias. The extent to which parent beliefs about supervision (e.g., intentions) will predict their enactment of closer supervision practices was not a focus of the current study. However, targeting the perceptions that health behaviour theories posit to predict behaviour appears to be a reasonable first step towards potential behaviour change (Taylor et al., 2006).

**Potential Sources of Bias**

**Confounding**

It has been suggested that many drowning prevention studies do not pay enough attention to confounding variables (Wallis et al., 2015), which has implications for how results are interpreted. While the current study attempted to control for variables that may have confounded results, it is possible that variables that were not specifically accounted for could have contributed to differences that were observed between Intervention and Control Conditions (e.g., misclassification bias). For example, the extent to which either group may have been exposed to drowning and water safety prevention material outside of the program was not assessed. Variables related to parents’ or children’s exposure to outdoor water, and risk experiences associated with water, may have impacted on the prediction of scores but were beyond the scope of the current study.

**Non-random Assignment of Participants to Condition**

Furthermore, while random assignment would have been the ideal approach for determining which participant group received S.A.F.E.R. Near Water, this was not possible for the current study. Given that random assignment is used to reduce the potential sources of bias amongst groups, the likelihood of systematic (and unmeasured) differences between participants in the Intervention and Control Conditions may be greater as a result of the group assignment method that was used. In future, evaluating the program within a more controlled research design (i.e.,
Randomized Controlled Trial) could reduce the potential for error and produce greater confidence in results.

**Effects of Clustering**

Prior to analyses, several steps were taken to identify potential clustering effects and to control for probabilistic non-equivalence amongst groups in a systematic way. Non-independence between Public and Private groups appeared to have the greatest impact on the Intervention Condition at Time 1, though the reasons for this are unknown. Public and Private groups were compared across select demographic variables to assess for potential differences. Those variables identified as being discrepant (child age and family income) were controlled for in analyses, and amongst the others that were assessed (parent education, safety courses taken, child gender, and ethnicity), no significant differences were noted. While non-equivalence may most likely be due to chance (in the absence of a probable theoretical reason), it could be possible that recruitment methods may have impacted parental responding in some unexpected way. Recruitment was consistent across sites in the Public group (in person for both Intervention and Control Conditions), but in the Private group, those in the Intervention Condition were recruited in person in addition to receiving an invitation email in attempt to increase response rate (those in the Control Condition only received an email). It could be that this affected parents in the Private-Intervention group in some way, though the mechanism through which this would have occurred is unclear.

**Psychometric Properties of the Water Safety Beliefs Scale**

It should also be noted that the internal consistency values for the Water Safety Beliefs Scale (WSB) overall (Cronbach’s Alpha = .73), and for the two factors of focus in analysis (Cronbach’s Alpha = .76, .69, for Factors 1 and 2 respectively), were at the low end of what is generally considered acceptable. While it has been noted that the threshold for acceptability of Alpha may range between .70 and .95 across sources (Tavakol & Dennick, 2011), this value nonetheless has implications for how results are interpreted. Cronbach’s Alpha assesses the interrelatedness amongst a set of items.
Specifically, it measures the proportion of variance amongst the items that can be ascribed to the same construct (Cronbach, 1951). A reliability estimate also provides information about the amount of error in measurement; in general, as reliability increases, the proportion of score variance that is attributed to error decreases (Tavakol & Dennick, 2011). The WSB Scale was created to address the need for a questionnaire specifically measuring drowning risk and water safety, the value of swimming lessons, and parent supervision. While this is seen as a positive feature of the current study, these psychometric limitations should be acknowledged; given the potential for error in parents’ scores on the WSB Scale, these results should be interpreted judiciously. Future research could explore whether the factor structure, and internal consistency values, suggested based on this study’s data is consistent with data from another sample. It may also be worthwhile exploring in future efforts the psychometric impacts of adding more items to the WSB Scale (i.e., internal consistency may be promoted by having more items that load on each factor), or to revise the scale to be more targeted and to focus on fewer factors (i.e., include items related to Factors 1 and 2 only). These decisions may depend on the priorities and aims of future researchers, and it would be recommended for these changes to be pilot tested prior to use in larger studies.

**Generalizability of Results**

Given the sample composition, the extent to which *S.A.F.E.R. Near Water* may have been efficacious amongst a more culturally and socio-economically diverse group of parents could not be evaluated. However, this would be a critical area of enquiry, especially considering the diversity that exists in Canada and the need to reach vulnerable and at-risk groups with water safety information as effectively as possible. *S.A.F.E.R. Near Water* was tailored to the experience of being a parent with a preschool aged child in swim lessons in Ontario. However, the extent to which the messaging and results would apply to those living in other areas and with more varied experiences interacting with water could not be determined by the current study. While recreational swimming is a common water activity in Canada (Drowning
Prevention Research Centre Canada for the Lifesaving Society, 2016), water may be used for other purposes (e.g., work, travel), might not be accessible for recreation, or could be unsafe for swimming in other geographical areas and communities (WHO, 2014). Given that knowledge and perceptions about water safety may vary across communities, it would be important to determine the types of messages that would be best suited to meet the needs of a greater diversity of people. In addition, participation in the current study required parents to be able to understand, and possess literacy in, the English language. It could be useful to explore the possibility of adapting materials to reduce the amount of reading required, or to translate materials to other languages.

Furthermore, interventions in the field of drowning prevention are often limited by relying too heavily on the role of education and information (Leavy et al., 2016) rather than placing this within a broader, and multi-strategic context. This was a limitation of the current study as well, though it was specifically intended for the focus of this program to be on education. Many (Langendorfer, 2011; Quan et al., 2015; Stallman et al., 2008) have advocated for swim lessons to focus on drowning prevention, and one way to incorporate drowning prevention into lessons for preschool aged children is to involve parents in safety education (Nguyen et al., 2003), as the current study aimed to do.

It is also important to consider how best to reach families who do not have access to swim lessons (e.g., cannot enroll due to costs; in communities where formal lessons are not offered) with safety information in a meaningful and relevant way. It is promising that efforts to prevent child drownings in high-risk regions (e.g., Bangladesh) are underway (Hossain et al., 2015), as well as national level approaches (e.g., in Australia) that apply a developmental framework to approaching the prevention of drowning (WHO, 2014). In Canada, the Lifesaving Society’s Swim to Survive Program has both community and educational partners (Bueschleb, 2011) and focuses on teaching school-aged children, at no cost and with no requirement to be enrolled in lessons, the skills necessary to be better prepared to prevent drowning.
While the current study evaluated *S.A.F.E.R. Near Water* within the context of swim lessons, schools may represent a potential venue to reach parents from a greater diversity of ethnic and socioeconomic groups with water safety education. There is no ‘one size fits all’ approach to water safety, and the World Health Organization (2017) appreciates this in their noteworthy publication providing feasible drowning prevention strategies that can be applied to diverse groups and communities worldwide. The global commitment to bolster civic awareness of children’s drowning risk and to intervene to prevent drowning is encouraging, and the safety of children relies on these efforts to continue.

**Conclusion**

In conclusion, *S.A.F.E.R. Near Water* appeared to successfully target perceptions related to water safety, drowning risk, supervision, and optimism bias in parents with children aged two through five enrolled in swimming lessons. This offers promise for the feasibility of delivering a multifaceted, parent-focused, educational program alongside young children’s swim programming. *S.A.F.E.R. Near Water* seemed to successfully communicate most of its intended messages, and was well-received by parents. Future work with parents may focus on reinforcing the complex idea that ‘swimming competence’ needs to be understood within a developmental drowning prevention context.
References


http://www.croixrouge.ca/article.asp?id=32238&tid=024


Appendix A

*S.A.F.E.R.* Near Water Posters

**Be watchful, stay close!**

Children do unpredictable things and don’t recognize danger.

**Be watchful, stay close!**

Children drown silently. They can’t call out for help.
Be watchful, stay close!

Children drown quickly. When was the last time you were “back in a minute”?

Drowning affects children of all ages.

Be watchful, stay close!

Swim lessons reduce risk, but do not replace the need for adult supervision.

PREVENT DROWNING

Young children drown QUICKLY and SILENTLY

BATHTUBS and POOLS are risk locations

Remember SAFER

Supervise by
Always being
Focused on the children and able to
Extend your arms and
Reach them

Anything else you need to do can wait.
Appendix B

Time 1 Questionnaire

PARENTS’ OPINIONS ABOUT WATER SAFETY

The purpose of this questionnaire is to find out your thoughts about outdoor water safety. Please answer each of the following questions. There are no right or wrong answers, we simply want to know what you think!

By ‘outside water’ we mean water that your child might swim or play in outdoors that is not lifeguarded and is at least 2 feet in water depth (e.g., backyard pool, lake). This does not include small shallow plastic or rubber pools that are usually less than 2 feet deep.

In completing this questionnaire, if we ask about ‘children’ please answer the questions with 2–5 year olds in mind.

1) When the weather is nice, do you have regular access to outside water situations? (e.g., lakes, waterfront property, backyard pools)

   _____ Yes

   a) How so? _____ Lakes or streams
      Check all that apply _____ Waterfront property
          _____ Beaches
          _____ Backyard pools
          _____ Other (please list) ____________________________

   b) In these situations has your child regularly received any “learn to swim” types of teaching or coaching (e.g., by a parent, other relative, family friend)?

      _____ Yes    _____ No

2) Which of the following do you have at your home? (check all that apply)

   _____ In-ground pool
   _____ Above-ground pool
   _____ Inflatable pool or other children’s pool
   _____ Spa/hot tub
   _____ None of these
3) Do you currently know how to swim 50 meters (164 feet) without stopping or touching the bottom?
   _____ YES    _____ NO

4) Can you tread water (e.g., use your arms and legs to stay afloat in the water, while keeping your head above the surface and your body in an upright position) for one minute?
   _____ YES    _____ NO

5) If you were to roll into the water, would you be able to orient yourself afterward and get your head above the surface?  _____ YES    _____ NO

6) Please check off ONE answer to indicate YOUR current level of swimming ability:
   _____ Unable to swim (e.g., non-swimmer)
   _____ Can swim a little, but not comfortable in deep water (e.g., weak swimmer)
   _____ Comfortable in deep water, but cannot swim very long or far (e.g., fair swimmer)
   _____ Able to swim for an extended period of time and distance (e.g., good swimmer)
   _____ Can swim competitively (or could) and for an extended period of time and distance (e.g., strong swimmer)

7) How do you feel about your ability to rescue your child from the water if the water was over your head?
   _____ Very comfortable
   _____ Comfortable
   _____ A little bit anxious
   _____ Fairly anxious
   _____ Very anxious

8) Have you ever personally experienced a life-threatening situation around water (e.g., when swimming, from falling in)?
   _____ YES    _____ NO

9) Has anyone that you have known personally ever experienced a life-threatening situation around water (e.g., when swimming, from falling in)?
   _____ YES    _____ NO

10) What do you think is the SINGLE BEST way to prevent drowning in OUTSIDE WATER SITUATIONS…
    a) … for toddlers under 2 years of age?
b) … for children 2 and 3 years of age?

________________________________________________________________________________________

c) … for children 4 and 5 years of age?

________________________________________________________________________________________

11) a. What is the **BEST AGE** for children to begin to learn to swim?

_____ YEARS _____ MONTHS

**WHY** – what is it about children at this age that makes them ready to begin to learn to swim? (*please select **ONE** answer from the options below)*

_____ Physical size and motor abilities

_____ Attention and ability to maintain focus

_____ Cognitive/language skills and ability to understand instructions

_____ Compliance or ability to follow instructions

_____ Fear of water makes them want to learn how to stay safe

_____ Have not learned to fear water yet so they are more comfortable in it

_____ Other (*please list*): ____________________________________________

b. Thinking about **YOUR OWN** young child, what do you think is/was the **BEST AGE** to begin to educate him/her about how to stay safe around **OUTDOOR WATER**?

_____ YEARS _____ MONTHS

12) How old do you think your child will be when s/he has learned to swim well enough to prevent themselves from drowning if they were to fall in water over their head?

_____ YEARS _____ MONTHS

13) People often have different perspectives about the value of learning to swim. Select which **ONE** of the following options is *most* true about how you view swimming lessons:

_____ It is a recreational or leisure activity/sport

OR

_____ It is a life skill
14) Which of the following do you think is the MOST important outcome of your child’s swim lessons? (please check ONE only)

_____ Being able to swim across the pool
_____ Being able to float
_____ Learning how to behave safely when in/near the water
_____ Being able to enjoy the water
_____ Being confident and relaxed in the water

15) Please select a number between 1 and 7 to indicate the extent to which you agree or disagree with each of the following statements. For each statement, please assume we are talking about children **YOUR CHILD’S AGE**.

1 = COMPLETELY DISAGREE
2 = MOSTLY DISAGREE
3 = SOMEWHAT DISAGREE
4 = SORT OF DISAGREE AND SORT OF AGREE
5 = SOMEWHAT AGREE
6 = MOSTLY AGREE
7 = COMPLETELY AGREE

1. _____ Swim lessons can prevent children at this age from drowning.
2. _____ The earlier children learn to swim, the safer they are when near water.
3. _____ Close supervision by adults is the best way to prevent children at this age from drowning.
4. _____ Children are good judges of their swimming abilities at this age.
5. _____ Drowning is preventable for children at this age.
6. _____ Children at this age who have had swimming lessons have learned how to behave safely near water and no longer need to be watched constantly.
7. _____ When children at this age drown it is because they have not learned to swim well enough.
8. _____ Parents are usually good judges of their child’s swimming abilities.
9. _____ Swimming lessons for children can lead parents to assume their child is a better swimmer than s/he actually is.
10. _____ For children at this age, learning to swim is better than relying on supervision to prevent child drowning.
11. _____ Children at this age have a good sense of the potential dangers of pools.
12. _____ Children who take swimming lessons have been taught about water 
safety, which reduces their need for constant supervision when near 
water.
13. _____ Children at this age know not to go near water if they can’t keep themselves 
safe.
14. _____ Swimming lessons can lead children to be over confident about their 
swimming abilities.
15. _____ Even when things get busy, I am able to keep my child in view all of the 
time when s/he is around water.
16. _____ Children at this age may fall in water that is over their head, but as long as 
they have had swimming lessons there is little risk of drowning when this 
happens.
17. _____ Children who have had swimming lessons have learned not to do risky 
things when near water.

1 = COMPLETELY DISAGREE
2 = MOSTLY DISAGREE
3 = SOMEWHAT DISAGREE
4 = SORT OF DISAGREE AND SORT OF AGREE
5 = SOMEWHAT AGREE
6 = MOSTLY AGREE
7 = COMPLETELY AGREE

18. _____ Children at this age may gain some swimming abilities from lessons but 
they are not likely to learn enough to prevent themselves from drowning.
19. _____ If children learn to swim, then parents don’t have to be there watching 
them every minute when they are near water.
20. _____ If a child were drowning nearby, people would hear splashing, crying, 
and screaming.
21. _____ A young child can be left alone while they are swimming for a few 
minutes as long as they are wearing a floating device (e.g., life jacket, arm 
floats/water wings).
22. _____ I do all I can to ensure my child’s safety when s/he is in the water.
23. ____ Increased confidence after swim lessons requires greater adult supervision of children this age around water.
24. ____ It is not realistic to expect parents to “constantly” supervise (i.e., never take your eyes off) toddlers around outdoor water.

16) For each statement below, think about **YOUR CHILD’S** behaviour in a pool like the one used for his/her swimming lessons.

Some of the items ask if your child can do something **WITHOUT** assistance – that means without anyone helping AND without needing any devices to help (lifejacket, floaties, noodle, etc). So, for questions that ask about doing the behaviour **WITHOUT** assistance, if your child could only do this **WITH** assistance, then you would check **NO** because s/he cannot do it ‘without assistance’.

Please check the appropriate box to indicate your child’s ability to do the following.  
*Please check only **ONE**.*

*Note: XXXX and the YYYY pools are XX metres (XX feet) in length.*

### AT THIS TIME, MY CHILD ...

<table>
<thead>
<tr>
<th></th>
<th>YES</th>
<th>NO</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Is comfortable getting his/her face, head, and body wet <strong>WITH</strong> assistance</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>2. Can enter the pool <strong>WITH</strong> assistance</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>3. Can change directions in the water <strong>WITH</strong> assistance</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>4. Can float on his/her back <strong>WITH</strong> assistance</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>5. Can float on his/her front <strong>WITH</strong> assistance</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>6. Can jump into chest-deep water <strong>WITH</strong> assistance</td>
<td>□</td>
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<tr>
<td>7. Can glide on his/her back <strong>WITH</strong> assistance</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>8. Can glide on his/her front <strong>WITH</strong> assistance</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>9. Can move around in the water by kicking or splashing feet <strong>WITH</strong> assistance</td>
<td>□</td>
<td>□</td>
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<tr>
<td>Question</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>-------------------------------------------------------------------------</td>
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</tr>
<tr>
<td>10. Is comfortable having his/her face under water without assistance</td>
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<tr>
<td>11. Can tread water or doggie paddle to stay afloat for at least 10 seconds without assistance</td>
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<tr>
<td>12. Can swim without assistance and without touching the bottom</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13. Can float without assistance on his/her back for 5 seconds</td>
<td></td>
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<tr>
<td>14. Can float without assistance on his/her stomach for 5 seconds with their face in the water</td>
<td></td>
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<tr>
<td>15. Can get to the top of the water without assistance if s/he falls under</td>
<td></td>
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<tr>
<td>16. Knows safety rules about being near water (e.g., no running or pushing)</td>
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<tr>
<td>17. Can keep from drowning without assistance if s/he fell under</td>
<td></td>
<td></td>
</tr>
<tr>
<td>18. Can swim without assistance on his/her stomach for:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5 metres (16.5 feet)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7 metres (23 feet)</td>
<td></td>
<td></td>
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<tr>
<td>10 metres (33 feet)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>19. Can swim without assistance on his/her back for:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7 metres (23 feet)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10 metres (33 feet)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20. Can jump without assistance off the side of a pool into water over his/her head</td>
<td></td>
<td></td>
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<tr>
<td>21. Can swim 1.5 metres (5 feet) without assistance back to the wall if s/he jumped in</td>
<td></td>
<td></td>
</tr>
<tr>
<td>22. Can get to the side without assistance if s/he fell in water over his/her head</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
23. Can climb out along the side of an in-ground pool by him/herself and **without** assistance

24. Would feel comfortable to jump into a pool from the side **without** assistance even if the water were over his/her head

25. Knows to check the depth of water before jumping into a pool

26. Understands about drowning being a risk in pools

27. Can be trusted to follow safety rules near pools if a supervisor is not watching constantly

28. Thinks s/he is a better swimmer than s/he actually is

29. Often is fearful and needs encouragement to get in or when in a pool

30. Knows to call for help if need be when in a pool

31. Has a healthy fear of ‘what can happen’ in a pool

32. Knows not to go in themselves but to call an adult if someone in the water needs help

33. Knows to climb out at the side of the pool if steps are not available/nearby

34. Knows to turn around and grab the wall after jumping or falling into the pool

35. Knows not to enter a pool until invited to do so or told they can do so by an adult

36. Is likely to panic if s/he falls into water that is over his/her head

37. Knows enough about pool safety and swimming that s/he does not require constant supervision near pools
17) Children have a need for supervision around outside water. However, the level of supervision required will vary from child to child depending on their age, personality, swimming ability, the child’s tendency to obey rules, and many other factors.

For each situation in the five scenarios below, please indicate what level of supervision **YOUR CHILD** would need at this time. Please select **ONE** of the following for each situation.

1 = I would be watching **constantly** and would be **within arms’ reach** at all times (e.g., never looking away for even a moment **AND** within an arms’ length of reaching my child)

2 = I would be watching **constantly** and would be **close but beyond arms’ reach** (e.g., never looking away for even a moment, and beyond arms’ length but less than 5 metres from my child)

3 = I would be watching **constantly** but would **not need to be right there** with him/her (e.g., never looking away for even a moment and in the yard/on the shore, more than 5 metres from my child)

4 = I would be watching **intermittently** from **nearby** within 5 metres (e.g., looking up occasionally from what I was doing, within 5 metres of my child)

5 = I would be watching **intermittently** from a **distance of more than 5 metres** from my child

6 = I would be nearby so I could **hear constantly** what was going on in the water, though I would not have my child in view (e.g., doing something in the yard or on shore but able to listen for my child the entire time from where I was)

a) **YOUR CHILD** is in a backyard pool that is **SHALLOW** so the child can touch bottom everywhere in the pool and there is no water over his/her head. How would you monitor the child if s/he is:

_____ Swimming/playing alone (e.g., splashing around on the surface)
_____ Swimming/playing with same-age friends (e.g., tossing a beach ball)
_____ Swimming/playing with other adults nearby and the adults are watching intermittently from the deck or water’s edge
_____ Swimming/playing with other adults nearby and the adults are watching constantly from the deck or water’s edge
_____ Swimming/playing with an older sibling (or non-adult friend/family member) who is watching them
b) YOUR CHILD is in the SHALLOW END of a backyard in-ground pool that also has a deep end, with a rope that clearly differentiates the two. How would you monitor the child if s/he is:

_____ Swimming/playing alone (e.g., splashing around on the surface)
_____ Swimming/playing with same-age friends (e.g., tossing a beach ball)
_____ Swimming/playing with other adults nearby and the adults are watching intermittently from the deck or water’s edge
_____ Swimming/playing with other adults nearby and the adults are watching constantly from the deck or water’s edge
_____ Swimming/playing with an older sibling (or non-adult friend/family member) who is watching them

c) YOUR CHILD is in a lake where s/he cannot touch the bottom, but s/he can hold on to the dock that has a ladder. How would you monitor the child if s/he is:

_____ Swimming/playing alone (e.g., splashing around on the surface)
_____ Swimming/playing with same-age friends (e.g., tossing a beach ball)
_____ Swimming/playing with other adults nearby and the adults are watching intermittently from the dock or water’s edge
_____ Swimming/playing with other adults nearby and the adults are watching constantly from the dock or water’s edge
_____ Swimming/playing with an older sibling (or non-adult friend/family member) who is watching them

d) YOUR CHILD is in shallow water at a beach where s/he can touch the bottom and is close to the shore, though the water becomes deeper further away from the shore. How would you monitor the child if s/he is:

_____ Swimming/playing alone (e.g., splashing around on the surface)
_____ Swimming/playing with same-age friends (e.g., tossing a beach ball)
_____ Swimming/playing with other adults nearby and the adults are watching intermittently from the shore
_____ Swimming/playing with other adults nearby and the adults are watching constantly from the shore
_____ Swimming/playing with an older sibling (or non-adult friend/family member) who is watching them
e) YOUR CHILD is sitting on the side of a built-in pool and dangling their feet in the water, and the water would be above their head if they were to enter the pool at that location. How would you monitor the child if s/he is:

_____ Playing alone (e.g., kicking on the surface)
_____ Playing with same-age friends (e.g., tossing a beach ball back and forth)
_____ Playing with other adults nearby and the adults are watching intermittently
_____ Playing with other adults nearby and the adults are watching constantly
_____ Playing with an older sibling (or non-adult friend/family member) who is watching them

18) Parents need to balance supervision to assure their child’s safety with the child’s needs for growth and independence. We are trying to learn more about parents’ attitudes about supervision and protectiveness needs of their young children, particularly when they are around outdoor water, like at the beach or a pool. Please read each statement below and select a response to indicate how much you agree or disagree with the statement listed. There are no right or wrong answers. We simply want to know what is true for you!

When you answer these questions, the child we are referring to is the one you have enrolled in swimming lessons.  

1 = STRONGLY DISAGREE  
2 = SOMEWHAT DISAGREE  
3 = NEITHER AGREE NOR DISAGREE  
4 = SOMEWHAT AGREE  
5 = STRONGLY AGREE

WHEN I AM AROUND OUTDOOR WATER, LIKE AT THE BEACH OR A POOL, WITH MY CHILD:

1. _____ I think of all the dangerous things that could happen
2. _____ I keep a close watch on my child
3. _____ I encourage my child to take risks if it means having fun during play
4. _____ I feel fearful that something might happen to my child
5. _____ I wait to see if he/she can do things on his/her own before I get involved
6. _____ I keep my child from playing rough games or doing things where he/she might get hurt
7. _____ I hover next to my child
1 = STRONGLY DISAGREE
2 = SOMEWHAT DISAGREE
3 = NEITHER AGREE NOR DISAGREE
4 = SOMEWHAT AGREE
5 = STRONGLY AGREE

8. _____ I stay within reach of my child when he/she is playing
9. _____ I make him/her keep away from anything that could be dangerous
10. _____ I know exactly what my child is doing
11. _____ I let my child do things for him/herself
12. _____ I make sure I know where my child is and what he/she is doing
13. _____ I let my child experience minor mishaps if what he/she is doing is lots of fun
14. _____ I have my child within arms’ reach at all times
15. _____ I stay close enough to my child that I can get to him/her quickly
16. _____ I can trust my child to play by himself/herself without constant supervision
17. _____ I let my child take some chances in what he/she does
18. _____ I encourage my child to try new things
19. _____ I feel very protective of my child
20. _____ I feel a strong sense of responsibility
21. _____ I let him/her learn from his/her own mishaps
22. _____ I try things with my child before leaving him/her to do them on his/her own
23. _____ I warn him/her about things that could be dangerous
24. _____ I say to myself that I can trust him/her to play safely
25. _____ I let my child make decisions for himself/herself
26. _____ I keep an eye on my child’s face to see how he/she is doing
Appendix C

Time 2 Questionnaire

1) Today’s date: Day: __________ Month: __________ Year: __________

2) Your child’s first name: _____________________

   Please note that this would be the SAME child you had in mind when you completed the questionnaires the first time.

3) Your first name: _________________________

   Please note that we are asking the SAME parent who completed the questionnaires the first time to complete them again now.

4) Your email address: ______________________________

5) Where do your child’s swim lessons take place? (please check one):

   ___ XXXX
   ___ YYYY

6) Will your child be participating in swim lessons again through the XXX in the:

   a) Winter or Spring 2014: _____ Yes _____ No

   b) Spring or Summer 2014: _____ Yes _____ No

   c) If yes to either, would you be willing to be contacted again during these lessons for a follow up to this project?

      _____ Yes _____ No
PARENTS’ OPINIONS ABOUT WATER SAFETY

THE PURPOSE OF THIS QUESTIONNAIRE IS TO FIND OUT YOUR THOUGHTS ABOUT OUTDOOR WATER SAFETY. PLEASE ANSWER EACH OF THE FOLLOWING QUESTIONS. THERE ARE NO RIGHT OR WRONG ANSWERS, WE SIMPLY WANT TO KNOW WHAT YOU THINK!

BY ‘OUTSIDE WATER’ WE MEAN WATER THAT YOUR CHILD MIGHT SWIM OR PLAY IN OUTDOORS THAT IS NOT LIFEGUARDED AND IS AT LEAST 2 FEET IN WATER DEPTH (E.G., BACKYARD POOL, LAKE). THIS DOES NOT INCLUDE SMALL SHALLOW PLASTIC OR RUBBER POOLS THAT ARE USUALLY LESS THAN 2 FEET DEEP.

IN COMPLETING THIS QUESTIONNAIRE, IF WE ASK ABOUT ‘CHILDREN’ PLEASE ANSWER THE QUESTIONS WITH 2 – 5 YEAR OLDS IN MIND.

1) What do you think is the SINGLE BEST way to prevent drowning in OUTSIDE WATER SITUATIONS…

   a) … for toddlers under 2 years of age?

   ________________________________

   b) … for children 2 and 3 years of age?

   ________________________________

   c) … for children 4 and 5 years of age?

   ________________________________

2) a. What is the BEST AGE for children to begin to learn to swim?

   _____ YEARS _____ MONTHS

   WHY – what is it about children at this age that makes them ready to begin to learn to swim? (please select ONE answer from the options below)

   ____ Physical size and motor abilities
   ____ Attention and ability to maintain focus
   ____ Cognitive/language skills and ability to understand instructions
   ____ Compliance or ability to follow instructions
   ____ Fear of water makes them want to learn how to stay safe
   ____ Have not learned to fear water yet so they are more comfortable in it
   ____ Other (please list): ____________________________________________
b. Thinking about **YOUR OWN** young child, what do you think is/was the **BEST AGE** to begin to educate him/her about how to stay safe around **OUTDOOR WATER**?

____ YEARS _____ MONTHS

3) How old do you think your child will be when s/he has learned to swim well enough to prevent themselves from drowning if they were to fall in water over their head?

____ YEARS _____ MONTHS

4) Which of the following do you think is the **MOST** important outcome of your child’s swim lessons? *(please check **ONE only**)*

____ Being able to swim across the pool  
____ Being able to float  
____ Learning how to behave safely when in/near the water  
____ Being able to enjoy the water  
____ Being confident and relaxed in the water

5) Please select a number between 1 and 7 to indicate the extent to which you agree or disagree with each of the following statements. For each statement, please assume we are talking about children **YOUR CHILD’S AGE**.

1 = **COMPLETELY DISAGREE**  
2 = **MOSTLY DISAGREE**  
3 = **SOMewhat DISAGREE**  
4 = **SORT of DISAGREE AND SORT of AGREE**  
5 = **SOMewhat AGREE**  
6 = **MOSTLY AGREE**  
7 = **COMPLETELY AGREE**

1. _____ Swim lessons can prevent children at this age from drowning.  
2. _____ The earlier children learn to swim, the safer they are when near water.  
3. _____ Close supervision by adults is the best way to prevent children at this age from drowning.  
4. _____ Children are good judges of their swimming abilities at this age.  
5. _____ Drowning is preventable for children at this age.  
6. _____ Children at this age who have had swimming lessons have learned how to behave safely near water and no longer need to be watched constantly.
1 = COMPLETELY DISAGREE
2 = MOSTLY DISAGREE
3 = SOMEWHAT DISAGREE
4 = SORT OF DISAGREE AND SORT OF AGREE
5 = SOMEWHAT AGREE
6 = MOSTLY AGREE
7 = COMPLETELY AGREE

7. _____ When children at this age drown it is because they have not learned to swim well enough.
8. _____ Parents are usually good judges of their child’s swimming abilities.
9. _____ Swimming lessons for children can lead parents to assume their child is a better swimmer than s/he actually is.
10. _____ For children at this age, learning to swim is better than relying on supervision to prevent child drowning.
11. _____ Children at this age have a good sense of the potential dangers of pools.
12. _____ Children who take swimming lessons have been taught about water safety, which reduces their need for constant supervision when near water.
13. _____ Children at this age know not to go near water if they can’t keep themselves safe.
14. _____ Swimming lessons can lead children to be over confident about their swimming abilities.
15. _____ Even when things get busy, I am able to keep my child in view all of the time when s/he is around water.
16. _____ Children at this age may fall in water that is over their head, but as long as they have had swimming lessons there is little risk of drowning when this happens.
17. _____ Children who have had swimming lessons have learned not to do risky things when near water.
18. _____ Children at this age may gain some swimming abilities from lessons but they are not likely to learn enough to prevent themselves from drowning.
19. _____ If children learn to swim, then parents don’t have to be there watching them every minute when they are near water.
20. _____ If a child were drowning nearby, people would hear splashing, crying, and screaming.
21. _____ A young child can be left alone while they are swimming for a few minutes as long as they are wearing a floating device (e.g., life jacket, arm floats/water wings).

22. _____ I do all I can to ensure my child’s safety when s/he is in the water.

23. _____ Increased confidence after swim lessons requires greater adult supervision of children this age around water.

24. _____ It is not realistic to expect parents to “constantly” supervise (i.e., never take your eyes off) toddlers around outdoor water.

6) For each statement below, think about YOUR CHILD’S behaviour in a pool like the one used for his/her swimming lessons.

Some of the items ask if your child can do something WITHOUT assistance – that means without anyone helping AND without needing any devices to help (lifejacket, floaties, noodle, etc). So, for questions that ask about doing the behaviour WITHOUT assistance, if your child could only do this WITH ASSISTANCE, then you would check NO because s/he cannot do it ‘without assistance’.

Please check the appropriate box to indicate your child’s ability to do the following. Please check only ONE.

Note: XXX and YYYY pools are XX metres (XX feet) in length.

**AT THIS TIME, MY CHILD ...**

1. Is comfortable getting his/her face, head, and body wet with assistance □ □

2. Can enter the pool with assistance □ □

3. Can change directions in the water with assistance □ □

4. Can float on his/her back with assistance □ □

5. Can float on his/her front with assistance □ □

6. Can jump into chest-deep water with assistance □ □

7. Can glide on his/her back with assistance □ □
8. Can glide on his/her front **with** assistance

9. Can move around in the water by kicking or splashing feet **with** assistance

10. Is comfortable having his/her face under water **without** assistance

11. Can tread water or doggie paddle to stay afloat for at least 10 seconds **without** assistance

12. Can swim **without** assistance and without touching the bottom

13. Can float **without** assistance on his/her back for 5 seconds

14. Can float **without** assistance on his/her stomach for 5 seconds with their face in the water

15. Can get to the top of the water **without** assistance if s/he falls under

16. Knows safety rules about being near water (e.g., no running or pushing)

17. Can keep from drowning **without** assistance if s/he fell under

18. Can swim **without** assistance on his/her stomach for:
   - 5 metres (16.5 feet)
   - 7 metres (23 feet)
   - 10 metres (33 feet)

19. Can swim **without** assistance on his/her back for:
   - 7 metres (23 feet)
   - 10 metres (33 feet)

20. Can jump **without** assistance off the side of a pool into water over his/her head
21. Can swim 1.5 metres (5 feet) **without** assistance back to the wall if s/he jumped in

22. Can get to the side **without** assistance if s/he fell in water over his/her head

23. Can climb out along the side of an in-ground pool by him/herself and **without** assistance

24. Would feel comfortable to jump into a pool from the side **without** assistance even if the water were over his/her head

25. Knows to check the depth of water before jumping into a pool

26. Understands about drowning being a risk in pools

27. Can be trusted to follow safety rules near pools if a supervisor is not watching constantly

28. Thinks s/he is a better swimmer than s/he actually is

29. Often is fearful and needs encouragement to get in or when in a pool

30. Knows to call for help if need be when in a pool

31. Has a healthy fear of ‘what can happen’ in a pool

32. Knows not to go in themselves but to call an adult if someone in the water needs help

33. Knows to climb out at the side of the pool if steps are not available/nearby

34. Knows to turn around and grab the wall after jumping or falling into the pool

35. Knows not to enter a pool until invited to do so or told they can do so by an adult
36. Is likely to panic if s/he falls into water that is over his/her head

37. Knows enough about pool safety and swimming that s/he does not require constant supervision near pools

7) Children have a need for supervision around outside water. However, the level of supervision required will vary from child to child depending on their age, personality, swimming ability, the child’s tendency to obey rules, and many other factors.

For each situation in the five scenarios below, please indicate what level of supervision YOUR CHILD would need at this time.

Please select ONE of the following for each situation.

1 = I would be watching constantly and would be within arms’ reach at all times (e.g., never looking away for even a moment AND within an arms’ length of reaching my child)

2 = I would be watching constantly and would be close but beyond arms’ reach (e.g., never looking away for even a moment, and beyond arms’ length but less than 5 metres from my child)

3 = I would be watching constantly but would not need to be right there with him/her (e.g., never looking away for even a moment and in the yard/on the shore, more than 5 metres from my child)

4 = I would be watching intermittently from nearby within 5 metres (e.g., looking up occasionally from what I was doing, within 5 metres of my child)

5 = I would be watching intermittently from a distance of more than 5 metres from my child

6 = I would be nearby so I could hear constantly what was going on in the water, though I would not have my child in view (e.g., doing something in the yard or on shore but able to listen for my child the entire time from where I was)
a) **YOUR CHILD is in a backyard pool that is SHALLOW so the child can touch bottom everywhere in the pool and there is no water over his/her head. How would you monitor the child if s/he is:**

- ____ Swimming/playing alone (e.g., splashing around on the surface)
- ____ Swimming/playing with same-age friends (e.g., tossing a beach ball)
- ____ Swimming/playing with other adults nearby and the adults are watching intermittently from the deck or water’s edge
- ____ Swimming/playing with other adults nearby and the adults are watching constantly from the deck or water’s edge
- ____ Swimming/playing with an older sibling (or non-adult friend/family member) who is watching them

**A reminder of the answer options:**

1 = I would be watching *constantly* and would be *within arms’ reach* at all times
2 = I would be watching *constantly* and would be *close but beyond arms’ reach*
3 = I would be watching *constantly* but would *not need to be right there* with him/her
4 = I would be watching *intermittently* from *nearby* within 5 metres
5 = I would be watching *intermittently* from a *distance of more than 5 metres* from my child
6 = I would be nearby so I could *hear constantly* what was going on in the water, though I would not have my child in view

b) **YOUR CHILD is in the SHALLOW END of a backyard in-ground pool that also has a deep end, with a rope that clearly differentiates the two. How would you monitor the child if s/he is:**

- ____ Swimming/playing alone (e.g., splashing around on the surface)
- ____ Swimming/playing with same-age friends (e.g., tossing a beach ball)
- ____ Swimming/playing with other adults nearby and the adults are watching intermittently from the deck or water’s edge
- ____ Swimming/playing with other adults nearby and the adults are watching constantly from the deck or water’s edge
- ____ Swimming/playing with an older sibling (or non-adult friend/family member) who is watching them
c) YOUR CHILD is in a lake where s/he cannot touch the bottom, but s/he can hold on to the dock that has a ladder. How would you monitor the child if s/he is:

_____ Swimming/playing alone (e.g., splashing around on the surface)
_____ Swimming/playing with same-age friends (e.g., tossing a beach ball)
_____ Swimming/playing with other adults nearby and the adults are watching intermittently from the dock or water’s edge
_____ Swimming/playing with other adults nearby and the adults are watching constantly from the dock or water’s edge
_____ Swimming/playing with an older sibling (or non-adult friend/family member) who is watching them

A reminder of the answer options:

1 = I would be watching *constantly* and would be *within arms’ reach* at all times
2 = I would be watching *constantly* and would be *close but beyond arms’ reach*
3 = I would be watching *constantly* but would *not need to be right there* with him/her
4 = I would be watching *intermittently* from nearby within 5 metres
5 = I would be watching *intermittently* from a *distance of more than 5 metres* from my child
6 = I would be nearby so I could *hear constantly* what was going on in the water, though I would not have my child in view

d) YOUR CHILD is in shallow water at a beach where s/he can touch the bottom and is close to the shore, though the water becomes deeper further away from the shore. How would you monitor the child if s/he is:

_____ Swimming/playing alone (e.g., splashing around on the surface)
_____ Swimming/playing with same-age friends (e.g., tossing a beach ball)
_____ Swimming/playing with other adults nearby and the adults are watching intermittently from the shore
_____ Swimming/playing with other adults nearby and the adults are watching constantly from the shore
_____ Swimming/playing with an older sibling (or non-adult friend/family member) who is watching them
e) **YOUR CHILD** is sitting on the side of a built-in pool and dangling their feet in the water, and the water would be above their head if they were to enter the pool at that location. How would you monitor the child if s/he is:

- _____ Playing alone (e.g., kicking on the surface)
- _____ Playing with same-age friends (e.g., tossing a beach ball back and forth)
- _____ Playing with other adults nearby and the adults are watching intermittently
- _____ Playing with other adults nearby and the adults are watching constantly
- _____ Playing with an older sibling (or non-adult friend/family member) who is watching them

8) Parents need to balance supervision to assure their child’s safety with the child’s needs for growth and independence. We are trying to learn more about parents’ attitudes about supervision and protectiveness needs of their young children, particularly when they are around outdoor water, like at the beach or a pool. Please read each statement below and select a response to indicate how much you agree or disagree with the statement listed. There are no right or wrong answers. We simply want to know what is true for you!

When you answer these questions, the child we are referring to is the one you have enrolled in swimming lessons.

1 = **STRONGLY DISAGREE**
2 = **SOMewhat DISAGREE**
3 = **NEITHER AGREE NOR DISAGREE**
4 = **SOMewhat AGREE**
5 = **STRONGLY AGREE**

**WHEN I AM AROUND OUTDOOR WATER, LIKE AT THE BEACH OR A POOL, WITH MY CHILD:**

1. _____ I think of all the dangerous things that could happen
2. _____ I keep a close watch on my child
3. _____ I encourage my child to take risks if it means having fun during play
4. _____ I feel fearful that something might happen to my child
5. _____ I wait to see if he/she can do things on his/her own before I get involved
6. _____ I keep my child from playing rough games or doing things where he/she might get hurt
7. _____ I hover next to my child
1 = STRONGLY DISAGREE
2 = SOMEWHAT DISAGREE
3 = NEITHER AGREE NOR DISAGREE
4 = SOMEWHAT AGREE
5 = STRONGLY AGREE

8. _____ I stay within reach of my child when he/she is playing

9. _____ I make him/her keep away from anything that could be dangerous

10. _____ I know exactly what my child is doing

11. _____ I let my child do things for him/herself

12. _____ I make sure I know where my child is and what he/she is doing

13. _____ I let my child experience minor mishaps if what he/she is doing is lots of fun

14. _____ I have my child within arms’ reach at all times

15. _____ I stay close enough to my child that I can get to him/her quickly

16. _____ I can trust my child to play by himself/herself without constant supervision

17. _____ I let my child take some chances in what he/she does

18. _____ I encourage my child to try new things

19. _____ I feel very protective of my child

20. _____ I feel a strong sense of responsibility

21. _____ I let him/her learn from his/her own mishaps

22. _____ I try things with my child before leaving him/her to do them on his/her own

23. _____ I warn him/her about things that could be dangerous

24. _____ I say to myself that I can trust him/her to play safely

25. _____ I let my child make decisions for himself/herself

26. _____ I keep an eye on my child’s face to see how he/she is doing
Time 2 Evaluation Questions – Intervention Condition Only

Please answer the following questions based on whichever Parent Sessions you were able to attend, and with children aged 2 through 5 years in mind.

1. Please select a number between 0 and 4 to indicate the extent to which the Parent Session(s) (i.e., the oral presentation and video) communicated the following messages to you?

   **Response Options:**
   0 = Not at all
   1 = A little bit
   2 = Half and half
   3 = A fair amount
   4 = A great deal

1. _____ Young children can drown quickly and in as little as 30 seconds
2. _____ Young children can drown silently and do not call out for help
3. _____ Siblings can be good supervisors
4. _____ Young children can drown anywhere there is water
5. _____ Young children often do unpredictable things
6. _____ Young children do not need to be supervised as closely if they know how to swim
7. _____ Young children have acquired the skills necessary to save themselves from drowning
8. _____ Young children cannot always judge what is dangerous
9. _____ Young children can drown as a result of falling into the water with clothes on
10. _____ Young children are good at following rules consistently
11. _____ Young children often drown when adults are present but not attending
12. _____ Children are not “drown-proof” even if they are taking swim lessons
13. _____ It is important for adults to be watchful and stay close when children are in and around water

2. Since attending the Session(s), how often have you thought about the content (i.e., information from the oral presentation and video)? (check one only)

   0 = Not at all
   1 = Occasionally
   2 = Some of the time
   3 = Fairly often
   4 = Very often
3. Have you told or talked to anyone about the Session(s) you attended (e.g., something that you found interesting or did not know before)?

______ Yes ______ No

4. Please select a number between 0 and 4 to indicate the extent to which the posters that have been up at the XXX communicated the following messages to you?

**RESPONSE OPTIONS:**

0 = Not at all
1 = A little bit
2 = Half and half
3 = A fair amount
4 = A great deal

1. ______ Swim lessons help reduce drowning risk, but do not replace the need for adult supervision of children near water

2. ______ Children of any age can drown

3. ______ Children are good at knowing what they are capable of doing in the water

4. ______ It is important to be watchful and stay close when children are around water

5. ______ Children can drown silently

6. ______ Parents do not need to supervise children around water if lifeguards are present

7. ______ Children can drown quickly

8. ______ Remembering SAFER can help to prevent drowning (e.g., parents should supervise by Always being Focused on the children and able to Extend your arms and Reach them)

9. ______ Children often do unpredictable things around water and don’t recognize the danger

10. ______ Drowning is not a risk for children under the age of five
5. Since the posters have been up, how often have you thought about these (i.e., images and/or messages from any of these)? *(check one only)*

0 = Not at all  
1 = Occasionally  
2 = Some of the time  
3 = Fairly often  
4 = Very often

6. Have you told or talked to anyone about the posters you saw (e.g., the images and/or messages)?

______ Yes  ______ No

7. How effective were the posters in getting your attention and making you stop to read them? *(check one only)*

0 = Not at all effective  
1 = A little bit  
2 = Somewhat  
3 = Fairly  
4 = Very effective

8. Did you read the blue handout from the Parent Sessions? *(check one only)*

______ I read both of them  
______ I read the Session #1 handout (January)  
______ I read the Session #2 handout (March)  
______ I did not get a chance to read the handouts  
______ I was not able to attend either Session and did not receive the handouts

9. How helpful did you find the information in the handout(s)? *(check one only)*

0 = Not at all helpful  
1 = A little bit  
2 = Somewhat  
3 = Fairly  
4 = Very helpful
10. Did you visit any of the links from the handout(s)?

______ No
______ Yes

If yes, which ones? (check all that apply)

_____ Living With Water videos (Kids Alive)
_____ News story (what drowning people look like)
_____ Know Before You Go (child walking out to the pool)
_____ Lifesaving Society's Swim to Survive video (three basis skills needed to survive an unexpected fall into deep water)

10. Did you know about the Swim to Survive Standard (e.g., ROLL into deep water, TREAD water for one minute, SWIM 50 metres) before attending the Parent Sessions?

_____ Yes
_____ No
_____ I was not able to attend this session
Appendix D

Time 1 Demographics Survey

To help us learn more about who is taking part in our project, please answer the following questions. **NO PERSONAL INFORMATION WILL EVER BE RELEASED.** We only report group summaries.

a) Because this study has a few parts, we would like to contact you over the course of your child’s swim lessons to let you know about these various parts and what we will need your help with (e.g., when to complete another short questionnaire, or about project activities). **Please provide your email address so we can contact you when the time comes for this.** We will not be releasing your email address to anyone; it is just for us to be able to contact you for the next part of the study. Thank you!

   Email address: ________________________________

b) Would you like a copy of the study results sent to you when this project is completed?

   Yes ______
   No ______

   *This will be sent by email to the address above*

1) Today’s date: Day: _______ Month: _______ Year: _______

2) Date of birth of this child: Day: _______ Month: _______ Year: _______

3) Child is a: _____ Boy _____ Girl _____ Other

4) You are a:

   _____ Mother _____ Father _____ Guardian
   (female) _____ Guardian (male) _____ Guardian (other)

5) This child’s **FIRST** name: ____________________________
6) Your **FIRST** name: __________________________________________

7) Name of this child’s current swim class (*please check one)*:

   ____ Sea Lion
   ____ Sea Otter
   ____ Salamander
   ____ Sunfish
   ____ Crocodile
   ____ Whale

8) Day of the week of this child’s swim class:

   ____ Monday
   ____ Tuesday
   ____ Wednesday
   ____ Thursday
   ____ Friday
   ____ Saturday
   ____ Sunday

9) Time that your child’s class meets each week: __________________________

10) Name of this child’s swim instructor (*if known*): ______________________

11) Where do your child’s swim lessons take place? (*please check one*)

   ____ XXX
   ____ YYY
12) If this is your child’s first swim class of any kind then skip to question 13, otherwise please tell us:

a) How old was this child when s/he first started swim lessons:

   ____Years  ____Months

b) In general, would you say that since starting your child in swim lessons, s/he has been in lessons:

   ____ Pretty well continuously (i.e., throughout the fall, winter, spring, and summer each year)
   ____ Fairly continuously except for an occasional break time (i.e., summer off)
   ____ Intermittently (with breaks throughout the year, not just the summer)
   ____ I really don’t recall

13) Which of the following best describes your ethnicity:

   ____ Aboriginal/First Nations/Métis
   ____ White/European
   ____ Black/African/Caribbean
   ____ Southeast Asian (e.g., Chinese, Japanese, Korean, Vietnamese, Cambodian, Filipino, etc)
   ____ South Asian (East Indian, Sri Lankan, etc)
   ____ West Asian (Iranian, Afghani, etc)
   ____ Latin American (Costa Rican, Guatemalan, Brazilian, Columbian, etc)
   ____ Arab (Saudi Arabian, Palestinian, Iraqi, etc)
   ____ Other ________________________________

14) Please check YOUR highest level of education:

   ____ Some High School
   ____ High School Diploma
   ____ Some College/University
   ____ College/University Degree
   ____ Post-graduate Training

15) Please check your family’s annual TAKE HOME income level:

   ____ Below $20,000
   ____ $20,000 – $39,999
   ____ $40,000 – $59,999
   ____ $60,000 – $79,999
   ____ $80,000 – $99,999
   ____ $100,000 – $120,000
   ____ Above $120,000
16) Please indicate if **YOU** have taken any of the following courses (*check all that apply*):

- [ ] First-aid course
- [ ] CPR course
- [ ] Pre-natal course
- [ ] Parenting course

17) Please indicate which best describes your family’s current household:

- [ ] Single parent household
- [ ] Two-parent household (i.e., married or common-law)
- [ ] Co-parenting partners/friends
- [ ] Multi-generational household (e.g., children, parents, grandparents)
- [ ] Other ___________________________
Appendix E

Swim Instructor Checklist

Instructor’s name: _________________

Date checklist was completed: Day ________ Month ________ Year ________

Child’s name: _________________

Participant Number (this will be on the sheet that your supervisor gives you): ___________

Site of lessons (check one): XXX YYY

Name of this child’s swim class (check one):

Sea Lion    Sea Otter    Salamander    Sunfish    Crocodile    Whale

Day of the week of this child’s swim class:

____ Monday
____ Tuesday
____ Wednesday
____ Thursday
____ Friday
____ Saturday
____ Sunday

Time that this child’s class meets each week: _____________________________________
For each statement below, think about **THIS CHILD’S** behaviour in a pool like the one used for his/her swimming lessons.

Some of the items ask if the child can do something **WITHOUT** assistance – that means without anyone helping **AND** without needing any devices to help (lifejacket, floaties, noodle, etc). So, for questions that ask about doing the behaviour **WITHOUT** assistance, if the child could only do this **WITH ASSISTANCE**, then you would check **NO** because s/he cannot do it ‘without assistance’.

Please check the appropriate box to indicate this child’s ability to do the following. 
*Please check only **ONE**.

<table>
<thead>
<tr>
<th>AT THIS TIME, THE CHILD ...</th>
<th>YES</th>
<th>NO</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Is comfortable getting his/her face, head, and body wet <strong>with</strong> assistance</td>
<td>❑</td>
<td>❑</td>
</tr>
<tr>
<td>2. Can enter the pool <strong>with</strong> assistance</td>
<td>❑</td>
<td>❑</td>
</tr>
<tr>
<td>3. Can change directions in the water <strong>with</strong> assistance</td>
<td>❑</td>
<td>❑</td>
</tr>
<tr>
<td>4. Can float on his/her back <strong>with</strong> assistance</td>
<td>❑</td>
<td>❑</td>
</tr>
<tr>
<td>5. Can float on his/her front <strong>with</strong> assistance</td>
<td>❑</td>
<td>❑</td>
</tr>
<tr>
<td>6. Can jump into chest-deep water <strong>with</strong> assistance</td>
<td>❑</td>
<td>❑</td>
</tr>
<tr>
<td>7. Can glide on his/her back <strong>with</strong> assistance</td>
<td>❑</td>
<td>❑</td>
</tr>
<tr>
<td>8. Can glide on his/her front <strong>with</strong> assistance</td>
<td>❑</td>
<td>❑</td>
</tr>
<tr>
<td>9. Can move around in the water by kicking or splashing feet <strong>with</strong> assistance</td>
<td>❑</td>
<td>❑</td>
</tr>
<tr>
<td>10. Is comfortable having his/her face under water <strong>without</strong> assistance</td>
<td>❑</td>
<td>❑</td>
</tr>
<tr>
<td>11. Can tread water or doggie paddle to stay afloat for at least 10 seconds <strong>without</strong> assistance</td>
<td>❑</td>
<td>❑</td>
</tr>
<tr>
<td>12. Can swim <strong>without</strong> assistance and without touching the bottom</td>
<td>❑</td>
<td>❑</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>13. Can float <strong>without</strong> assistance on his/her back for <strong>5</strong> seconds</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>14. Can float <strong>without</strong> assistance on his/her stomach for <strong>5</strong> seconds with their face in the water</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>15. Can get to the top of the water <strong>without</strong> assistance if s/he falls under</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>16. Knows safety rules about being near water (e.g., no running or pushing)</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>17. Can swim <strong>without</strong> assistance on his/her stomach for:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5 metres (16.5 feet)</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>7 metres (23 feet)</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>10 metres (33 feet)</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>18. Can swim <strong>without</strong> assistance on his/her back for:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7 metres (23 feet)</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>10 metres (33 feet)</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>19. Can jump <strong>without</strong> assistance off the side of a pool into water over his/her head</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>20. Can swim 1.5 metres (5 feet) <strong>without</strong> assistance back to the wall if s/he jumped in</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>21. Can get to the side <strong>without</strong> assistance if s/he fell in water over his/her head</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>22. Can climb out along the side of an in-ground pool by him/herself and <strong>without</strong> assistance</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>23. Would feel comfortable to jump into a pool from the side <strong>without</strong> assistance even if the water were over his/her head</td>
<td>□</td>
<td>□</td>
</tr>
</tbody>
</table>
Appendix F

Seminar #1: Pre-knowledge Survey

Participant #: __________________________ (to be completed by the researchers)

Today’s date (dd/mm/yyyy): __________________________________________
Your first name: ____________________________________________________
Your child’s first name: _____________________________________________

1. What age group is at the highest risk for drowning worldwide? (please check one only)
   - Under 2 years of age
   - Under 5 years of age
   - Ages 5 – 9
   - Ages 10 – 15
   - Ages 16 – 19
   - Ages 20 – 35
   - Ages 36 – 50
   - Ages 50+

2. Which of the following best describes the actions of a young child who is drowning:
   (check one only)

   They...
   - Yell and call out for help
   - Wave their arms and make a lot of noise by splashing around in the water
   - Call out for help and make noise splashing around in the water
   - Do not call out for help and are motionless in the water
   - Do not call out for help and are moving their arms in the water

3. Child drownings can happen in as little as...

   - 2 seconds
   - 5 seconds
   - 10 seconds
   - 30 seconds
   - 60 seconds
4. Which of the following are reasons why young children aged 2 through 5 are at particular risk for drowning: (check any that apply)

☐ Capabilities are constantly changing
☐ Lifejackets don’t always fit little ones properly
☐ Can behave unpredictably
☐ Often do not see water as dangerous
☐ They like to try and hold their breath under water

5. What are the three key elements to successful supervision? (check off three boxes)

☐ Caution
☐ Continuity
☐ Attention
☐ Planning
☐ Anticipation
☐ Proximity

6. What is the most effective strategy for parents to prevent children aged 2 through 5 from drowning? (check one only)

☐ Close and lock pool fences/gates
☐ Teach children rules about how to stay safe around water
☐ Stay where you can always hear the child when they are in and around water
☐ Stay where you can always watch the child when they are in and around water
☐ Stay “within arms” reach of children when they are in and around water
☐ Have older siblings watch children when parents are busy

THANK YOU!
Appendix G

Seminar #2: Pre-knowledge Survey

Participant #: __________________________ (to be completed by the researchers)

Today’s date (dd/mm/yyyy): __________________________

Your first name: ____________________________________

Your child’s first name: ______________________________

1. Drownings in young children: (check any that apply)
   - ☐ Occur most often when children are in swimming situations
   - ☐ Often occur when children were not expected to be in the water
   - ☐ Happen only to children who cannot swim
   - ☐ Are not likely if children are swimming with buddies
   - ☐ Rarely happen close to the shore/water’s edge
   - ☐ Often occur when children are playing in the water
   - ☐ Rarely happen if older siblings are present

2. In Canada, on average, how many children die every week due to drowning? (check one only)
   - ☐ 1
   - ☐ 2
   - ☐ 3
   - ☐ 4

3. Which of the following are reasons why young children are at particular risk for drowning: (check any that apply)
   - ☐ They are not yet able to follow water safety rules consistently
   - ☐ They often imitate older children and their risk behaviours
   - ☐ They think they are skilled swimmers and like to test out their well-developed abilities
   - ☐ They like to play unsafe games in the water
   - ☐ If children can do okay in pools, they assume they would also be okay in open water (e.g., lakes)
   - ☐ They don’t check to see if they can touch the bottom as they swim around in pools
   - ☐ They cannot yet ‘swim’ well enough
   - ☐ Lifejackets are often too big on them and don’t reliably keep them above water
4. Which of the following best describes what children aged 2 through 5 are taught in their learn-to-swim classes? (check any that apply)

☐ How to avoid water hazards
☐ Rescue skills
☐ Distance swimming
☐ Water comfort and familiarity
☐ Different kinds of swimming strokes
☐ How to dive safely and properly
☐ Basic water safety skills
☐ How to breathe properly under water
☐ All of the above

5. What are the THREE Swim to Survive skills that a child needs to better prepare them to survive an unexpected fall into the water? (check off three boxes)

☐ Tread water for 1 minute
☐ Tread water for 2 minutes
☐ Hold breath for 30 seconds
☐ Float on their back for 30 seconds
☐ Swim 50 metres
☐ Swim 25 metres
☐ Dive into the water
☐ Roll into deep water
☐ Float at the surface, and call out for help

6. What factor is most important in deciding whether a young child is able to ‘swim’ and keep themselves safe in the water? (check one only)

☐ Whether the child can move 25 metres through the water
☐ Whether the child can dive into water, and then swim 25 metres
☐ When the child can be trusted to rescue themselves if they were to fall in the water
☐ Swim strokes the child can perform, and the distance they can swim
☐ Developmental stage of the child, and how their water skills relate to drowning prevention
☐ Length of time the child has been in swimming lessons
☐ Child’s ability to tread water
7. When young children are at a lifeguarded pool, parents: (check one only)

☐ Can relax knowing a lifeguard will be watching closely
☐ Should be at a distance of 10 metres or less from their child in the water
☐ Should keep an eye on their child at all times from wherever they are
☐ Should be within arms’ reach of children in the water, watching as much as the parent can
☐ Can put older siblings in charge if all children are wearing lifejackets
☐ Should be within arms’ reach of children in the water, and watching constantly

8. When young children are in a backyard pool, parents: (check one only)

☐ Can relax as long as they are sure the child knows the ‘pool rules’
☐ Should be at a distance of 10 metres of less from their child in the water
☐ Should keep an eye on their child at all times from wherever they are
☐ Should be within arms’ reach of children in the water, watching as much as the parent can
☐ Should put older siblings in charge when they cannot be there to supervise
☐ Should be within arms’ reach of children in the water, and watching constantly

THANK YOU!
Appendix H

Seminar #1: Post-knowledge Survey

Participant #: __________________________ (to be completed by the researchers)

Today’s date (dd/mm/yyyy): ______________________________

Your first name: __________________________________________

Your child’s first name: _____________________________________

1. What age group is at the highest risk for drowning worldwide? (please check one only)

☐ Under 2 years of age
☐ Under 5 years of age
☐ Ages 5 – 9
☐ Ages 10 – 15
☐ Ages 16 – 19
☐ Ages 20 – 35
☐ Ages 36 – 50
☐ Ages 50+

2. Which of the following best describes the actions of a young child who is drowning: (check one only)

They…

☐ Yell and call out for help
☐ Wave their arms and make a lot of noise by splashing around in the water
☐ Call out for help and make noise splashing around in the water
☐ Do not call out for help and are motionless in the water
☐ Do not call out for help and are moving their arms in the water

3. Child drownings can happen in as little as…

☐ 2 seconds
☐ 5 seconds
☐ 10 seconds
☐ 30 seconds
☐ 60 seconds
4. Which of the following are reasons why young children aged 2 through 5 are at particular risk for drowning? *(check any that apply)*

- [ ] Capabilities are constantly changing
- [ ] Lifejackets don’t always fit little ones properly
- [ ] Can behave unpredictably
- [ ] Often do not see water as dangerous
- [ ] They like to try and hold their breath under water

5. What are the three key elements to successful supervision? *(check off three boxes)*

- [ ] Caution
- [ ] Continuity
- [ ] Attention
- [ ] Planning
- [ ] Anticipation
- [ ] Proximity

6. What is the most effective strategy for parents to prevent children aged 2 through 5 from drowning? *(check one only)*

- [ ] Close and lock pool fences/gates
- [ ] Teach children rules about how to stay safe around water
- [ ] Stay where you can always *hear* the child when they are in and around water
- [ ] Stay where you can always *watch* the child when they are in and around water
- [ ] Stay “within arms’” reach of children when they are in and around water
- [ ] Have older siblings watch children when parents are busy

7. Which of the following is a good way to remember how to supervise children near water? *(check one only)*

- [ ] S.T.O.P.
- [ ] W.A.T.C.H.
- [ ] S.A.F.E.R.
- [ ] P.A.C.
- [ ] W.A.T.E.R.
8. How engaging did you find this Session (e.g., how well did it hold your interest and attention)?

☐ 1 = not at all engaging
☐ 2 = a little bit
☐ 3 = somewhat
☐ 4 = moderately (½ and ½)
☐ 5 = fairly
☐ 6 = very
☐ 7 = extremely engaging

9. How emotionally arousing did you find this Session (e.g., how much of an impact did this have on your emotions)?

☐ 1 = not at all emotionally arousing
☐ 2 = a little bit
☐ 3 = somewhat
☐ 4 = moderately (½ and ½)
☐ 5 = fairly
☐ 6 = very
☐ 7 = extremely emotionally arousing

10. How important was the material that we presented today?

☐ 1 = not at all important
☐ 2 = a little bit
☐ 3 = somewhat
☐ 4 = moderately (½ and ½)
☐ 5 = fairly
☐ 6 = very
☐ 7 = extremely important

THANK YOU!
Appendix I

Seminar #2: Post-knowledge Survey

Participant #: __________________________ (to be completed by the researchers)

Today’s date (dd/mm/yyyy): ________________________________

Your first name: ________________________________

Your child’s first name: ________________________________

1. Drownings in young children: (check any that apply)
   - ☐ Occur most often when children are in swimming situations
   - ☐ Often occur when children were not expected to be in the water
   - ☐ Happen only to children who cannot swim
   - ☐ Are not likely if children are swimming with buddies
   - ☐ Rarely happen close to the shore/water’s edge
   - ☐ Often occur when children are playing in the water
   - ☐ Rarely happen if older siblings are present

2. In Canada, on average, how many children die every week due to drowning? (check one only)
   - ☐ 1
   - ☐ 2
   - ☐ 3
   - ☐ 4

3. Which of the following are reasons why young children are at particular risk for drowning: (check any that apply)
   - ☐ They are not yet able to follow water safety rules consistently
   - ☐ They often imitate older children and their risk behaviours
   - ☐ They think they are skilled swimmers and like to test out their well-developed abilities
   - ☐ They like to play unsafe games in the water
   - ☐ If children can do okay in pools, they assume they would also be okay in open water (e.g., lakes)
   - ☐ They don’t check to see if they can touch the bottom as they swim around in pools
   - ☐ They cannot yet ‘swim’ well enough
   - ☐ Lifejackets are often too big on them and don’t reliably keep them above water
4. Which of the following best describes what children aged 2 through 5 are taught in their learn-to-swim classes? (check any that apply)

☐ How to avoid water hazards
☐ Rescue skills
☐ Distance swimming
☐ Water comfort and familiarity
☐ Different kinds of swimming strokes
☐ How to dive safely and properly
☐ Basic water safety skills
☐ How to breathe properly under water
☐ All of the above

5. What are the THREE Swim to Survive skills that a child needs to better prepare them to survive an unexpected fall into the water? (check off three boxes)

☐ Tread water for 1 minute
☐ Tread water for 2 minutes
☐ Hold breath for 30 seconds
☐ Float on their back for 30 seconds
☐ Swim 50 metres
☐ Swim 25 metres
☐ Dive into the water
☐ Roll into deep water
☐ Float at the surface, and call out for help

6. What factor is most important in deciding whether a young child is able to ‘swim’ and keep themselves safe in the water? (check one only)

☐ Whether the child can move 25 metres through the water
☐ Whether the child can dive into water, and then swim 25 metres
☐ When the child can be trusted to rescue themselves if they were to fall in the water
☐ Swim strokes the child can perform, and the distance they can swim
☐ Developmental stage of the child, and how their water skills relate to drowning prevention
☐ Length of time the child has been in swimming lessons
☐ Child’s ability to tread water
7. When young children are at a lifeguarded pool, parents: (check one only)

☐ Can relax knowing a lifeguard will be watching closely
☐ Should be at a distance of 10 metres or less from their child in the water
☐ Should keep an eye on their child at all times from wherever they are
☐ Should be within arms’ reach of children in the water, watching as much as
   the parent can
☐ Can put older siblings in charge if all children are wearing lifejackets
☐ Should be within arms’ reach of children in the water, and watching constantly

8. When young children are in a backyard pool, parents: (check one only)

☐ Can relax as long as they are sure the child knows the ‘pool rules’
☐ Should be at a distance of 10 metres or less from their child in the water
☐ Should keep an eye on their child at all times from wherever they are
☐ Should be within arms’ reach of children in the water, watching as much as
   the parent can
☐ Should put older siblings in charge when they cannot be there to supervise
☐ Should be within arms’ reach of children in the water, and watching constantly

THANK YOU!
Appendix J

Seminar #1: Informational Take-home Handout

CHILDREN CAN DROWN QUICKLY AND SILENTLY
KEEP THEM IN VIEW AND WITHIN REACH

- Children can drown in just a few centimeters of water, and in as little as 30 seconds
- What happens in movies is NOT reality: children do NOT call out and splash around when drowning
- Parents are often optimistic that their child will be safe and follow the rules, but:
  o Little ones are curious and like to explore
  o Water looks interesting and children do not recognize danger
- What kids are able to do changes day by day and they like to try out their new abilities:
  o Little ones will behave unpredictably, and this can be risky when in and around water
- Children often drown when they unexpectedly fall into the water and are wearing clothes:
  o Children can panic and forget what they are supposed to do
  o Wet clothes are heavy and make it difficult to move – little ones do not yet have the strength and motor abilities to manage this
- Young children CANNOT be expected to keep themselves safe on their own around water. Nothing replaces the need for close and constant adult supervision!

When your children are near water, keep them SAFER

Supervise by
Always being
Focused on the children and able to
Extend your arms and
Reach them

- Do all you can to avoid distractions and short lapses in supervision when little ones are in/around water!

THINK ABOUT WHAT YOU ARE ALREADY DOING THAT WORKS WELL FOR KEEPING YOUR CHILD IN VIEW AND WITHIN REACH WHEN NEAR WATER --
KEEP DOING THIS OR MAKE CHANGES SO YOU CAN DO THIS!

NOTE: THE INFORMATION PROVIDED ABOVE IS BASED ON ACTUAL RESEARCH FINDINGS ABOUT HOW CHILDREN DROWN AND WAYS PROVEN TO PREVENT THIS
Appendix K

Seminar #2: Informational Take-home Handout

YOUNG CHILDREN CANNOT BE EXPECTED TO KEEP THEMSELVES SAFE
KEEP THEM IN VIEW AND WITHIN REACH AROUND WATER

• No child is drown-proof! Children can drown anywhere there is water. Little ones often drown in bathtubs and pools, and when they are playing in the water. Many children even drown with siblings right nearby.

• Young children are particularly at risk for drowning because they:
  o Are “top heavy” and prone to tripping/falling
  o Do not always remember and follow water safety rules, even if they have been taught these
  o Often try things that they see older children doing. They do not realize that they cannot yet do these things safely.

• Parents often think that young children know enough about swimming that they can keep themselves safe near water, but:
  o Even if they are taking swim lessons, young children cannot stay safe on their own. They still need their parents to be watchful and stay close – remember, kids do unpredictable things and can’t always judge what is dangerous.
  o Unexpected events (e.g., falls) can happen, and most young children are not developmentally capable of rescuing themselves (e.g., they cannot yet Swim to Survive)

• The Swim to Survive standard will help you know when your child is better prepared to survive an unexpected fall into deep water. The three basic skills are done in sequence, and are:

  1. **ROLL** into deep water (Stay calm, re-orient yourself + get to the surface)
  2. **TREAD** water for one minute (Imagine the strength needed if they have clothes and shoes on!)
  3. **SWIM** 50 metres

At these young ages, remember SAFER when children are in and around water!

Supervise by
Always being
Focused on the children and able to
Extend your arms and
Reach them

Remember:

**IF THERE IS MORE THAN ONE ADULT PRESENT, DESIGNATE WHO IS THE SUPERVISOR.**
OLDER SIBLINGS ARE NOT EFFECTIVE SUPERVISORS.
**NOTHING** is as important as your child’s safety. Everything else can wait!

Note: The information provided above is based on actual research findings about how children drown and ways proven to prevent this
Appendix L

Seminar #1: Listing of Websites From Video #1

FROM THE VIDEO

“Living with Water” videos
http://www.kidsalive.com.au

“Know Before You Go – Swim Safety :30”
http://www.youtube.com/watch?v=G3VcChB4C0o

News story
https://www.youtube.com/watch?v=X1mVcSUttX4
FROM THE VIDEO

“Living with Water” videos
http://www.kidsalive.com.au

“Swim to Survive - 3 min. version - English”
http://www.youtube.com/watch?v=HBiS0os4m9Y
Appendix N

List of Eight Factors From Water Safety Beliefs Scale

- **Factor 1:** ‘Inaccurate judgment of swim skill and drown-risk behaviour’ (items: 4, 8, 11, 13, 16, 17; Cronbach’s Alpha = .76)

- **Factor 2:** ‘Swim lessons reduce supervision need’ (items: 6, 7, 10, 12; Cronbach’s Alpha = .69). This factor was also calculated with the inclusion of item 3R. While item 3R had the highest loading on Factor 6, it did not fit well conceptually with the other item (20). Therefore, 3R was considered in Factor 2, where its loading was the next highest. Cronbach’s Alpha for Factor 2 with Item 3R included was .64. In conclusion, however, Item 3R was not retained in the final solution for Factor 2 because Cronbach’s Alpha was greater (.69) after removing this item, and because 3R was not considered an appropriate fit with the other items that are about swim lessons.

- **Factor 3:** ‘External locus of control for prevention’ (items: 19, 21, 24; Cronbach’s Alpha = .54)

- **Factor 4:** ‘Belief in the value of swim lessons’ (items: 1, 2)

- **Factor 5:** ‘Swim lessons lead to overconfidence in parents and children’ (items: 9R, 14R, 23R; Cronbach’s Alpha = .49)

- **Factor 6:** ‘Inaccurate judgment about the circumstances surrounding drowning’ (item 20)

- **Factor 7:** ‘Drowning is not preventable’ (items: 5R, 15R)

- **Factor 8:** ‘Safety cannot be ensured’ (items: 18R, 22R)
Table 1
*Demographic Composition for the Intervention Condition*

<table>
<thead>
<tr>
<th></th>
<th>Public</th>
<th>Private</th>
<th>Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$N$ (%)</td>
<td>$N$ (%)</td>
<td>$N$ (%)</td>
</tr>
<tr>
<td>Sample Size</td>
<td>39 (42%)</td>
<td>53 (58%)</td>
<td>92 (100%)</td>
</tr>
<tr>
<td>Child Age</td>
<td>$M = 4.20$ years, $SD = .84$</td>
<td>$M = 3.97$ years, $SD = .80$</td>
<td>$M = 4.07$ years, $SD = .82$</td>
</tr>
<tr>
<td>Participating Parent</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Father</td>
<td>18 (46%)</td>
<td>8 (15%)</td>
<td>26 (28%)</td>
</tr>
<tr>
<td>Mother</td>
<td>21 (54%)</td>
<td>45 (85%)</td>
<td>66 (72%)</td>
</tr>
<tr>
<td>Child Gender</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Boy</td>
<td>22 (56%)</td>
<td>28 (53%)</td>
<td>50 (54%)</td>
</tr>
<tr>
<td>Girl</td>
<td>17 (44%)</td>
<td>25 (47%)</td>
<td>42 (46%)</td>
</tr>
<tr>
<td>Family Take-Home Income Level</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>1. Below $20,000</td>
<td>1 (3%)</td>
<td>0 (0%)</td>
<td>1 (1.1%)</td>
</tr>
<tr>
<td>2. $20,000 – $39,999</td>
<td>1 (3%)</td>
<td>0 (0%)</td>
<td>1 (1.1%)</td>
</tr>
<tr>
<td>3. $40,000 – $59,999</td>
<td>0 (0%)</td>
<td>1 (2%)</td>
<td>1 (1.1%)</td>
</tr>
<tr>
<td>4. $60,000 – $79,999</td>
<td>7 (19%)</td>
<td>7 (13.7%)</td>
<td>14 (15.9%)</td>
</tr>
<tr>
<td>5. $80,000 – $99,999</td>
<td>12 (32%)</td>
<td>5 (9.8%)</td>
<td>17 (19.3%)</td>
</tr>
<tr>
<td>6. $100,000 – $120,000</td>
<td>9 (24%)</td>
<td>14 (27.5%)</td>
<td>23 (26.1%)</td>
</tr>
<tr>
<td>7. Above $120,000</td>
<td>7 (19%)</td>
<td>24 (47.1%)</td>
<td>31 (35.2%)</td>
</tr>
<tr>
<td>Mean (range: 1 to 7)</td>
<td>$M = 5.24$, $SD = 1.36$</td>
<td>$M = 6.04$, $SD = 1.15$</td>
<td>$M = 5.70$, $SD = 1.30$</td>
</tr>
</tbody>
</table>
Table 1 cont.

Demographic Composition for the Intervention Condition

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<td>N (%)</td>
<td>N (%)</td>
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<tr>
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<td></td>
<td></td>
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</tr>
<tr>
<td>Aboriginal/First Nations/Métis</td>
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<td>0 (0%)</td>
<td>0 (0%)</td>
</tr>
<tr>
<td>White/European</td>
<td>35 (89.7%)</td>
<td>45 (86.5%)</td>
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<tr>
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<td>1 (2.6%)</td>
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<td>2 (2.2%)</td>
</tr>
<tr>
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<td>0 (0%)</td>
<td>3 (5.8%)</td>
<td>3 (3.3%)</td>
</tr>
<tr>
<td>South Asian</td>
<td>1 (2.6%)</td>
<td>2 (3.8%)</td>
<td>3 (3.3%)</td>
</tr>
<tr>
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<td>0 (0%)</td>
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<td>Latin American</td>
<td>1 (2.6%)</td>
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<td>2 (2.2%)</td>
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<td>Arab</td>
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</tr>
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<td>0 (0%)</td>
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<td>Non-swimmer</td>
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<td>1 (1%)</td>
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<tr>
<td>Weak Swimmer</td>
<td>2 (5%)</td>
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<td>10 (11%)</td>
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<td>Fair Swimmer</td>
<td>15 (39%)</td>
<td>13 (25%)</td>
<td>28 (30.8%)</td>
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Table 2
Demographic Composition for the Control Condition

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<td></td>
<td>N (%)</td>
<td>N (%)</td>
<td>N (%)</td>
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<td>Sample Size</td>
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<tr>
<td>N = 89 (59%)</td>
<td>N = 61 (41%)</td>
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<tr>
<td>Child Age</td>
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<td>M = 4.35 years, SD = .86</td>
<td>M = 3.78 years, SD = .96</td>
<td>M = 4.12 years, SD = .94</td>
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<td>Participating Parent</td>
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<td>Father</td>
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<td>Mother</td>
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<td>56 (92%)</td>
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<td>Boy</td>
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<td>24 (40%)</td>
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<td>Girl</td>
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<td>36 (60%)</td>
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<td>2. $20,000 – $39,999</td>
<td>6 (6.9%)</td>
<td>1 (2%)</td>
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<td>3. $40,000 – $59,999</td>
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<td>0 (0%)</td>
<td>12 (8.6%)</td>
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<tr>
<td>4. $60,000 – $79,999</td>
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<td>6 (11%)</td>
<td>22 (15.7%)</td>
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<tr>
<td>5. $80,000 – $99,999</td>
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<td>10 (19%)</td>
<td>23 (16.4%)</td>
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<tr>
<td>6. $100,000 – $120,000</td>
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<td>11 (21%)</td>
<td>35 (25.0%)</td>
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<tr>
<td>7. Above $120,000</td>
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<td>25 (47%)</td>
<td>40 (28.6%)</td>
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<tr>
<td>Mean (range: 1 to 7)</td>
<td>$M = 4.91, SD = 1.59$</td>
<td>$M = 5.98, SD = 1.20$</td>
<td>$M = 5.31, SD = 1.54$</td>
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Table 2 cont.
Demographic Composition for the Control Condition

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<th>Public N (%)</th>
<th>Private N (%)</th>
<th>Overall N (%)</th>
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<td>Aboriginal/First Nations/Métis</td>
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<td>0 (0%)</td>
<td>0 (0%)</td>
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<tr>
<td>White/European</td>
<td>77 (86.5%)</td>
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<td>5 (8%)</td>
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<tr>
<td>Southeast Asian</td>
<td>5 (5.6%)</td>
<td>4 (7%)</td>
<td>9 (6%)</td>
</tr>
<tr>
<td>South Asian</td>
<td>3 (3.4%)</td>
<td>5 (8%)</td>
<td>8 (5%)</td>
</tr>
<tr>
<td>West Asian</td>
<td>0 (0%)</td>
<td>0 (0%)</td>
<td>0 (0%)</td>
</tr>
<tr>
<td>Latin American</td>
<td>0 (0%)</td>
<td>0 (0%)</td>
<td>0 (0%)</td>
</tr>
<tr>
<td>Arab</td>
<td>1 (1.1%)</td>
<td>0 (0%)</td>
<td>1 (1%)</td>
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<td>Other</td>
<td>3 (3.4%)</td>
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<tr>
<td>Highest Level of Parent Education</td>
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<tr>
<td>Some High School</td>
<td>0 (0%)</td>
<td>0 (0%)</td>
<td>0 (0%)</td>
</tr>
<tr>
<td>High School Diploma</td>
<td>4 (5%)</td>
<td>3 (4.9%)</td>
<td>7 (5%)</td>
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<tr>
<td>Some College/University</td>
<td>7 (8%)</td>
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<td>43 (70.5%)</td>
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<td>Post-graduate Training</td>
<td>26 (29%)</td>
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<td>35 (23%)</td>
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<tr>
<td>Parent’s Swimming Competency</td>
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<td></td>
</tr>
<tr>
<td>Non-swimmer</td>
<td>1 (1%)</td>
<td>4 (7%)</td>
<td>5 (3.4%)</td>
</tr>
<tr>
<td>Weak Swimmer</td>
<td>10 (12%)</td>
<td>10 (16%)</td>
<td>20 (13.5%)</td>
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<tr>
<td>Fair Swimmer</td>
<td>25 (29%)</td>
<td>22 (36%)</td>
<td>47 (31.8)</td>
</tr>
<tr>
<td>Good Swimmer</td>
<td>36 (41%)</td>
<td>24 (39%)</td>
<td>60 (40.5%)</td>
</tr>
<tr>
<td>Strong Swimmer</td>
<td>15 (17%)</td>
<td>1 (2%)</td>
<td>16 (10.8%)</td>
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Table 3
*Pearson Correlations Among Time 1 Variables of Interest*

** sig < .001, * sig < .01

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<th>Water Context Pool</th>
<th>Water Context Lake</th>
<th>Water Context Beach</th>
</tr>
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<td>.786**</td>
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<td>.611**</td>
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<td>Factor 1: Inaccurate Judgment</td>
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<td>.175**</td>
<td>.278**</td>
</tr>
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<td>.322**</td>
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<td>-.245**</td>
<td>-.297**</td>
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Table 3 cont.

*Pearson Correlations Among Time 1 Variables of Interest*

** sig < .001, * sig < .01

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<td>Adults</td>
<td>Siblings</td>
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Table 3 cont.

*Pearson Correlations Among Time 1 Variables of Interest*

** sig < .001, * sig < .01

<table>
<thead>
<tr>
<th>Measure</th>
<th>Time 1 Variable</th>
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<th>Protectiveness</th>
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<th>Factor 2: Supervision Not Needed</th>
<th>WSB Overall</th>
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Table 4
Intraclass Correlation (ICC) and Design Effect (DEFF) Values Associated With Public Versus Private for the Intervention Condition
* denotes DEFF greater than 2

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<td></td>
<td>s = 46 (avg cluster size)</td>
<td>1+(s-1)ICC</td>
<td>s = 46 (avg cluster size)</td>
<td>1+(s-1)ICC</td>
</tr>
<tr>
<td>POAWS</td>
<td>Water Context</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Pool</td>
<td>0.035</td>
<td>*2.575</td>
<td>0.027</td>
<td>*2.215</td>
</tr>
<tr>
<td></td>
<td>Lake</td>
<td>0.015</td>
<td>1.675</td>
<td>0.011</td>
<td>1.495</td>
</tr>
<tr>
<td></td>
<td>Beach</td>
<td>0.014</td>
<td>1.63</td>
<td>0.001</td>
<td>1.045</td>
</tr>
<tr>
<td></td>
<td>Social Context</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Alone</td>
<td>0.027</td>
<td>*2.215</td>
<td>0.030</td>
<td>*2.350</td>
</tr>
<tr>
<td></td>
<td>Friends</td>
<td>0.033</td>
<td>*2.485</td>
<td>0.050</td>
<td>*3.250</td>
</tr>
<tr>
<td></td>
<td>Adults</td>
<td>0.027</td>
<td>*2.215</td>
<td>0.005</td>
<td>1.225</td>
</tr>
<tr>
<td></td>
<td>Siblings</td>
<td>0.031</td>
<td>*2.395</td>
<td>0.021</td>
<td>1.945</td>
</tr>
<tr>
<td></td>
<td>All Contexts</td>
<td>0.031</td>
<td>*2.395</td>
<td>low var</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td>Swim Skills (% Yes)</td>
<td></td>
<td>1.855</td>
<td>low var</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td>Factor 1: Inaccurate Judgment</td>
<td></td>
<td>1.900</td>
<td>0.008</td>
<td>1.360</td>
</tr>
<tr>
<td></td>
<td>Factor 2: Supervision Not Needed</td>
<td>low var</td>
<td>---</td>
<td>low var</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td>WSB Overall</td>
<td>0.040</td>
<td>*2.800</td>
<td>low var</td>
<td>---</td>
</tr>
<tr>
<td>PSAPQ-BEACH</td>
<td>Protectiveness</td>
<td>0.042</td>
<td>*2.890</td>
<td>0.009</td>
<td>1.405</td>
</tr>
<tr>
<td></td>
<td>Supervision</td>
<td>0.037</td>
<td>*2.665</td>
<td>0.012</td>
<td>1.540</td>
</tr>
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</table>
Table 5
Intraclass Correlation (ICC) and Design Effect Factor (DEFF) Values Associated With Public Versus Private for the Control Condition
* denotes DEFF greater than 2

<table>
<thead>
<tr>
<th>Measure</th>
<th>Variable</th>
<th>ICC</th>
<th>DEFF</th>
<th>ICC</th>
<th>DEFF</th>
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<tbody>
<tr>
<td><strong>POAWS</strong></td>
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<td></td>
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<tr>
<td>Water Context</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pool</td>
<td>.003</td>
<td>1.135</td>
<td>.001</td>
<td>1.045</td>
<td></td>
</tr>
<tr>
<td>Lake</td>
<td>low var</td>
<td>---</td>
<td>.007</td>
<td>1.315</td>
<td></td>
</tr>
<tr>
<td>Beach</td>
<td>low var</td>
<td>---</td>
<td>.042</td>
<td>*2.890</td>
<td></td>
</tr>
<tr>
<td>Social Context</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alone</td>
<td>low var</td>
<td>---</td>
<td>.009</td>
<td>1.405</td>
<td></td>
</tr>
<tr>
<td>Friends</td>
<td>.004</td>
<td>1.180</td>
<td>.015</td>
<td>1.675</td>
<td></td>
</tr>
<tr>
<td>Adults</td>
<td>low var</td>
<td>---</td>
<td>.004</td>
<td>1.18</td>
<td></td>
</tr>
<tr>
<td>Siblings</td>
<td>low var</td>
<td>---</td>
<td>.007</td>
<td>1.315</td>
<td></td>
</tr>
<tr>
<td>All Contexts</td>
<td>.004</td>
<td>1.180</td>
<td>low var</td>
<td>---</td>
<td></td>
</tr>
<tr>
<td>Swim Skills (%)</td>
<td>.002</td>
<td>1.090</td>
<td>.047</td>
<td>*3.115</td>
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</tr>
<tr>
<td>Factor 1: Inaccurate</td>
<td>.014</td>
<td>1.630</td>
<td>.016</td>
<td>1.720</td>
<td></td>
</tr>
<tr>
<td>Judgment</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Factor 2: Supervision</td>
<td>.003</td>
<td>1.135</td>
<td>.011</td>
<td>1.495</td>
<td></td>
</tr>
<tr>
<td>Not Needed</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>WSB Overall</td>
<td>.008</td>
<td>1.360</td>
<td>.016</td>
<td>1.720</td>
<td></td>
</tr>
<tr>
<td>PSAPQ-BEACH</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Protectiveness</td>
<td>.009</td>
<td>1.405</td>
<td>.001</td>
<td>1.045</td>
<td></td>
</tr>
<tr>
<td>Supervision</td>
<td>.009</td>
<td>1.405</td>
<td>.004</td>
<td>1.180</td>
<td></td>
</tr>
</tbody>
</table>
Table 6  
*Group x Type Organization ANOVA Results For Each Time 1 Variable of Interest, and Associated Descriptive Data*

<table>
<thead>
<tr>
<th>Measure</th>
<th>Time 1 Variable</th>
<th>Condition x Type Organization</th>
<th>Intervention</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Public M (SD)</td>
<td>Private M (SD)</td>
</tr>
<tr>
<td>POAWS</td>
<td>Water Context</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Pool</td>
<td>$F(1, 222) = .92, ns$</td>
<td>2.33 (1.04)</td>
<td>2.00 (.75)</td>
</tr>
<tr>
<td></td>
<td>Lake</td>
<td>$F(1, 222) = .97, ns$</td>
<td>1.40 (.78)</td>
<td>1.25 (.52)</td>
</tr>
<tr>
<td></td>
<td>Beach</td>
<td>$F(1, 222) = .06, ns$</td>
<td>2.13 (1.21)</td>
<td>1.90 (.87)</td>
</tr>
<tr>
<td>Social Context</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Alone</td>
<td>$F(1, 222) = .89, ns$</td>
<td>1.80 (.76)</td>
<td>1.60 (.54)</td>
</tr>
<tr>
<td></td>
<td>Friends</td>
<td>$F(1, 222) = 1.07, ns$</td>
<td>1.82 (.76)</td>
<td>1.59 (.54)</td>
</tr>
<tr>
<td></td>
<td>Adults</td>
<td>$F(1, 222) = .22, ns$</td>
<td>2.29 (1.13)</td>
<td>2.00 (.76)</td>
</tr>
<tr>
<td></td>
<td>Siblings</td>
<td>$F(1, 222) = 1.55, ns$</td>
<td>2.31 (1.22)</td>
<td>1.98 (.83)</td>
</tr>
<tr>
<td></td>
<td>All Contexts</td>
<td>$F(1, 222) = .74, ns$</td>
<td>2.10 (.97)</td>
<td>1.83 (.63)</td>
</tr>
<tr>
<td>Swim Skills (% Yes)</td>
<td></td>
<td>$F(1, 222) = 1.08, ns$</td>
<td>53.22 (13.40)</td>
<td>49.29 (15.87)</td>
</tr>
<tr>
<td>Factor 1: Inaccurate Judgment</td>
<td></td>
<td>$F(1, 222) = .04, ns$</td>
<td>2.40 (.79)</td>
<td>2.21 (.83)</td>
</tr>
<tr>
<td>Factor 2: Supervision Not Needed</td>
<td></td>
<td>$F(1, 222) = 1.20, ns$</td>
<td>1.77 (.83)</td>
<td>1.70 (.90)</td>
</tr>
<tr>
<td>WSB Overall</td>
<td></td>
<td>$F(1, 222) = .36, ns$</td>
<td>2.52 (.47)</td>
<td>2.36 (.48)</td>
</tr>
<tr>
<td>PSAPQ-</td>
<td>Protectiveness</td>
<td>$F(1, 222) = 1.15, ns$</td>
<td>3.87 (.65)</td>
<td>4.11 (.47)</td>
</tr>
<tr>
<td>BEACH</td>
<td>Supervision</td>
<td>$F(1, 222) = .37, ns$</td>
<td>3.77 (.76)</td>
<td>4.02 (.56)</td>
</tr>
</tbody>
</table>
Table 7
Regression Results Demonstrating the Effect of Condition on Time 2 Score, After Controlling for Child Age, Family Income, and Time 1 Score

<table>
<thead>
<tr>
<th>Measure</th>
<th>Time 2 Variable</th>
<th>$R^2$</th>
<th>$R^2$ Change</th>
<th>$F$ Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>POAWS</td>
<td>Water Context</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Pool</td>
<td>.51</td>
<td>.15</td>
<td>$F(1, 204) = 62.38, p &lt; .001$</td>
</tr>
<tr>
<td></td>
<td>Lake</td>
<td>.26</td>
<td>.03</td>
<td>$F(1, 204) = 7.87, p &lt; .01$</td>
</tr>
<tr>
<td></td>
<td>Beach</td>
<td>.45</td>
<td>.10</td>
<td>$F(1, 206) = 37.70, p &lt; .001$</td>
</tr>
<tr>
<td>Social Context</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Alone</td>
<td>.39</td>
<td>.11</td>
<td>$F(1, 204) = 35.10, p &lt; .001$</td>
</tr>
<tr>
<td></td>
<td>Friends</td>
<td>.42</td>
<td>.11</td>
<td>$F(1, 204) = 37.79, p &lt; .001$</td>
</tr>
<tr>
<td></td>
<td>Adults</td>
<td>.55</td>
<td>.12</td>
<td>$F(1, 203) = 54.48, p &lt; .001$</td>
</tr>
<tr>
<td></td>
<td>Siblings</td>
<td>.47</td>
<td>.15</td>
<td>$F(1, 203) = 55.81, p &lt; .001$</td>
</tr>
<tr>
<td></td>
<td>All Contexts</td>
<td>.54</td>
<td>.14</td>
<td>$F(1, 204) = 63.09, p &lt; .001$</td>
</tr>
<tr>
<td>Swim Skills (% Yes)</td>
<td></td>
<td>.68</td>
<td>.003</td>
<td>$F(1, 216) = 1.96, ns$</td>
</tr>
<tr>
<td>Factor 1: Inaccurate Judgment</td>
<td></td>
<td>.60</td>
<td>.11</td>
<td>$F(1, 219) = 59.67, p &lt; .001$</td>
</tr>
<tr>
<td>Factor 2: Supervision Not Needed</td>
<td></td>
<td>.33</td>
<td>.07</td>
<td>$F(1, 218) = 21.42, p &lt; .001$</td>
</tr>
<tr>
<td>WSB Overall</td>
<td></td>
<td>.64</td>
<td>.17</td>
<td>$F(1, 219) = 106.44, p &lt; .001$</td>
</tr>
<tr>
<td>PSAPQ-BEACH</td>
<td>Protectiveness</td>
<td>.41</td>
<td>.01</td>
<td>$F(1, 213) = 1.81, ns$</td>
</tr>
<tr>
<td></td>
<td>Supervision</td>
<td>.43</td>
<td>.05</td>
<td>$F(1, 213) = 17.35, p &lt; .001$</td>
</tr>
</tbody>
</table>
Table 8
Additional Regression Results Demonstrating The Effect of Condition On Time 2 Score, After Controlling for Child Age, Family Income, and Time 1 Score

<table>
<thead>
<tr>
<th>Measure</th>
<th>Variable</th>
<th>Unstandardized B for Condition [95% CIs]</th>
<th>t Value for B for Condition</th>
<th>Part Correlation (sr^2) for Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>POAWS</td>
<td>Water Context</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Pool</td>
<td>.68 [.51 – .85]</td>
<td>(t = 7.90, p &lt; .001)</td>
<td>.39</td>
</tr>
<tr>
<td></td>
<td>Lake</td>
<td>.19 [.06 – .32]</td>
<td>(t = 2.81, p &lt; .01)</td>
<td>.17</td>
</tr>
<tr>
<td></td>
<td>Beach</td>
<td>.62 [.42 – .82]</td>
<td>(t = 6.01, p &lt; .001)</td>
<td>.31</td>
</tr>
<tr>
<td></td>
<td>Social Context</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Alone</td>
<td>.46 [.31 – .61]</td>
<td>(t = 5.92, p &lt; .001)</td>
<td>.33</td>
</tr>
<tr>
<td></td>
<td>Friends</td>
<td>.44 [.30 – .59]</td>
<td>(t = 6.15, p &lt; .001)</td>
<td>.33</td>
</tr>
<tr>
<td></td>
<td>Adults</td>
<td>.61 [.45 – .77]</td>
<td>(t = 7.38, p &lt; .001)</td>
<td>.35</td>
</tr>
<tr>
<td></td>
<td>Siblings</td>
<td>.72 [.53 – .91]</td>
<td>(t = 7.47, p &lt; .001)</td>
<td>.38</td>
</tr>
<tr>
<td></td>
<td>All Contexts</td>
<td>.58 [.44 – .72]</td>
<td>(t = 7.94, p &lt; .001)</td>
<td>.38</td>
</tr>
<tr>
<td></td>
<td>Swim Skills (% Yes)</td>
<td>1.86 [-.76 – 4.48]</td>
<td>(t = 1.40, ns)</td>
<td>.05</td>
</tr>
<tr>
<td></td>
<td>Factor 1: Inaccurate Judgment</td>
<td>.67 [.50 – .85]</td>
<td>(t = 7.72, p &lt; .001)</td>
<td>.33</td>
</tr>
<tr>
<td></td>
<td>Factor 2: Supervision Not Needed</td>
<td>.49 [.28 – .70]</td>
<td>(t = 4.63, p &lt; .001)</td>
<td>.26</td>
</tr>
<tr>
<td></td>
<td>WSB Overall</td>
<td>.56 [.46 – .67]</td>
<td>(t = 10.32, p &lt; .001)</td>
<td>.42</td>
</tr>
<tr>
<td>PSAPQ-BEACH</td>
<td>Protectiveness</td>
<td>-.07 [-.17 – .03]</td>
<td>(t = -1.35, ns)</td>
<td>-.07</td>
</tr>
<tr>
<td></td>
<td>Supervision</td>
<td>-.28 [-.41 – -.15]</td>
<td>(t = -4.17, p &lt; .001)</td>
<td>-.22</td>
</tr>
</tbody>
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Table 9
Means and Standard Deviations For Each Time 2 Variable Upon Which Regression Analyses Were Performed
* denotes when a lower score indicates less endorsed risk

<table>
<thead>
<tr>
<th>Measure</th>
<th>Time 2 Variable</th>
<th>Intervention Condition</th>
<th>Control Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>M</td>
<td>SD</td>
</tr>
<tr>
<td>POAWS</td>
<td>*Water Context</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>*Pool</td>
<td>1.46</td>
<td>.51</td>
</tr>
<tr>
<td></td>
<td>*Lake</td>
<td>1.10</td>
<td>.31</td>
</tr>
<tr>
<td></td>
<td>*Beach</td>
<td>1.47</td>
<td>.61</td>
</tr>
<tr>
<td></td>
<td>*Social Context</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>*Alone</td>
<td>1.29</td>
<td>.36</td>
</tr>
<tr>
<td></td>
<td>*Friends</td>
<td>1.30</td>
<td>.36</td>
</tr>
<tr>
<td></td>
<td>*Adults</td>
<td>1.48</td>
<td>.55</td>
</tr>
<tr>
<td></td>
<td>*Siblings</td>
<td>1.40</td>
<td>.52</td>
</tr>
<tr>
<td></td>
<td>*All Contexts</td>
<td>1.39</td>
<td>.43</td>
</tr>
<tr>
<td>Swim Skills (% Yes)</td>
<td>53.62</td>
<td>16.31</td>
<td>53.48</td>
</tr>
<tr>
<td></td>
<td>*Factor 1: Inaccurate Judgment</td>
<td>1.78</td>
<td>.62</td>
</tr>
<tr>
<td></td>
<td>*Factor 2: Supervision Not Needed</td>
<td>1.32</td>
<td>.47</td>
</tr>
<tr>
<td></td>
<td>*WSB Overall</td>
<td>1.86</td>
<td>.41</td>
</tr>
<tr>
<td>PSAPQ-BEACH</td>
<td>Protectiveness</td>
<td>4.11</td>
<td>.49</td>
</tr>
<tr>
<td></td>
<td>Supervision</td>
<td>4.17</td>
<td>.56</td>
</tr>
</tbody>
</table>
Table 10
Parents’ Mean Ratings (Range: 0 – 4) of How Effective The Parent Seminars Were in Communicating Each Message (n = 85)
* denotes negatively framed messages that were not communicated in the intervention/the opposite was communicated, lower scores = less effective

<table>
<thead>
<tr>
<th>Message</th>
<th>Parents’ Mean Effectiveness Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Message</td>
<td>M</td>
</tr>
<tr>
<td>1. It is important for adults to be watchful and stay close when children are in and around water is constant.</td>
<td>4.00</td>
</tr>
<tr>
<td>2. Young children can drown quickly and in as little as 30 seconds</td>
<td>3.79</td>
</tr>
<tr>
<td>3. Young children can drown silently and do not call out for help</td>
<td>3.87</td>
</tr>
<tr>
<td><strong>4. Siblings can be good supervisors</strong></td>
<td>.33</td>
</tr>
<tr>
<td>5. Young children can drown anywhere there is water</td>
<td>3.91</td>
</tr>
<tr>
<td>6. Young children often do unpredictable things</td>
<td>3.78</td>
</tr>
<tr>
<td><strong>7. Young children do not need to be supervised as closely if they know how to swim</strong></td>
<td>.54</td>
</tr>
<tr>
<td><strong>8. Young children have acquired the skills necessary to save themselves from drowning</strong></td>
<td>.40</td>
</tr>
<tr>
<td>9. Young children cannot always judge what is dangerous</td>
<td>3.64</td>
</tr>
<tr>
<td>10. Young children can drown as a result of falling into the water with clothes on</td>
<td>3.80</td>
</tr>
<tr>
<td><strong>11. Young children are good at following rules consistently</strong></td>
<td>.36</td>
</tr>
<tr>
<td>12. Young children often drown when adults are present but not attending</td>
<td>3.55</td>
</tr>
<tr>
<td>13. Children are not &quot;drown-proof&quot; even if they are taking swim lessons</td>
<td>3.92</td>
</tr>
</tbody>
</table>
Table 11
Parents’ Mean Ratings (Range: 0 – 4) of How Effective The Posters Were in Communicating Each Message (n = 85)
* denotes negatively framed messages that were not communicated by the poster, lower scores = less effective

<table>
<thead>
<tr>
<th>Message</th>
<th>Parents’ Mean Effectiveness Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
</tr>
<tr>
<td>1. Swim lessons help reduce drowning risk, but do not replace the need</td>
<td>2.96</td>
</tr>
<tr>
<td>for adult supervision of children near water</td>
<td></td>
</tr>
<tr>
<td>2. Children of any age can drown</td>
<td>2.87</td>
</tr>
<tr>
<td>*3. Children are good at knowing what they are capable of doing in the</td>
<td>.69</td>
</tr>
<tr>
<td>water</td>
<td></td>
</tr>
<tr>
<td>4. It is important to be watchful and stay close when children are</td>
<td>3.41</td>
</tr>
<tr>
<td>around water</td>
<td></td>
</tr>
<tr>
<td>5. Children can drown silently</td>
<td>2.88</td>
</tr>
<tr>
<td>*6. Parents do not need to supervise children around water if lifeguards</td>
<td>.49</td>
</tr>
<tr>
<td>are present</td>
<td></td>
</tr>
<tr>
<td>7. Children can drown quickly</td>
<td>3.27</td>
</tr>
<tr>
<td>8. Remembering SAFER can help to prevent drowning (e.g., parents should</td>
<td>3.33</td>
</tr>
<tr>
<td>Supervise by Always, being Focused on the children and able to Extend</td>
<td></td>
</tr>
<tr>
<td>your arms and Reach them)</td>
<td></td>
</tr>
<tr>
<td>9. Children often do unpredictable things around water and don't</td>
<td>3.06</td>
</tr>
<tr>
<td>recognize the danger</td>
<td></td>
</tr>
<tr>
<td>*10. Drowning is not a risk for children under the age of five</td>
<td>.51</td>
</tr>
<tr>
<td>Item</td>
<td>Pre Survey ( (N = 89) )</td>
</tr>
<tr>
<td>--------</td>
<td>-----------------------------</td>
</tr>
<tr>
<td></td>
<td>Total ( N ) (% of total)</td>
</tr>
<tr>
<td>Item 1</td>
<td>72 (81%)</td>
</tr>
<tr>
<td>Item 2</td>
<td>82 (92%)</td>
</tr>
<tr>
<td>Item 3</td>
<td>34 (38%)</td>
</tr>
<tr>
<td>Item 4</td>
<td></td>
</tr>
<tr>
<td>33% Correct</td>
<td>41 (46%)</td>
</tr>
<tr>
<td>67% Correct</td>
<td>21 (24%)</td>
</tr>
<tr>
<td>100% Correct</td>
<td>27 (30%)</td>
</tr>
<tr>
<td>Item 5</td>
<td></td>
</tr>
<tr>
<td>33% Correct</td>
<td>8 (9%)</td>
</tr>
<tr>
<td>67% Correct</td>
<td>62 (70%)</td>
</tr>
<tr>
<td>100% Correct</td>
<td>19 (21%)</td>
</tr>
<tr>
<td>Item 6</td>
<td>60 (67%)</td>
</tr>
<tr>
<td>Item 7</td>
<td>--</td>
</tr>
<tr>
<td>Item</td>
<td>Pre Survey (N = 92)</td>
</tr>
<tr>
<td>------</td>
<td>---------------------</td>
</tr>
<tr>
<td></td>
<td>Total N (% of total)</td>
</tr>
<tr>
<td>Item 1</td>
<td>50% Correct</td>
</tr>
<tr>
<td></td>
<td>100% Correct</td>
</tr>
<tr>
<td>Item 2</td>
<td></td>
</tr>
<tr>
<td>Item 3</td>
<td>25% Correct</td>
</tr>
<tr>
<td></td>
<td>50% Correct</td>
</tr>
<tr>
<td></td>
<td>75% Correct</td>
</tr>
<tr>
<td></td>
<td>100% Correct</td>
</tr>
<tr>
<td>Item 4</td>
<td>50% Correct</td>
</tr>
<tr>
<td></td>
<td>100% Correct</td>
</tr>
<tr>
<td>Item 5</td>
<td>33% Correct</td>
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<td></td>
<td>67% Correct</td>
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<tr>
<td></td>
<td>100% Correct</td>
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<tr>
<td>Item 6</td>
<td></td>
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<td>Item 7</td>
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<td>Item 8</td>
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</tr>
</tbody>
</table>
Figure 1. Inputs and activities for program logic model

**Inputs**

**Time and skills of study personnel**
- Swim school staff: Instructors
- Site staff
- University of Guelph researchers and research assistants

**Money**
- Remuneration for participants/staff
- Study materials (i.e., photocopies/printing)
- Travel
- Staffing

**Space**
- Within the swim schools to conduct seminars

**Activities**

In collaboration with swim school staff, University of Guelph researchers implemented a water safety intervention program ('S.A.F.E.R. Near Water') to parents of children aged 2 through 5 enrolled in swimming lessons.

Parents received a water safety intervention program consisting of educational information presented to them at their child’s swim school over the course of their child’s swim lesson period:
- Parent seminars
- Posters
- Handouts

Intervention materials that parents receive contain messaging that focuses on:
- Developmental factors that leave children vulnerable to drowning (vulnerability)
- Scope and burden of child fatal and non-fatal drownings (severity, vulnerability)
- Factors associated with child drownings (vulnerability)
- Relation between caregiver supervision and child drownings (response efficacy, benefits, behavioural control)
- Inaccurate judgments that could increase drowning risk (vulnerability)
- Swimming lessons and swimming competence, and the value of supervision (vulnerability, optimism bias, response efficacy, cues to action)
- Common barriers to close supervision, and how to overcome these (self-efficacy, behavioural control, subjective norms)
Figure 2. Outcomes for program logic model

Program activities

Knowledge

Drowning risk
Swim to Survive benchmarks
Developmental vulnerabilities
Conceptualization of swim competence

Optimism bias
Supervision beliefs
Accuracy of swim competence/risk judgments
Perceptions of drowning risk