MONASH University

DEVELOPING SAFETY RISK INTELLIGENCE

An analysis of effective safety education programs for children in early childhood settings

Sue-anne O'Neill

Diploma of Education, Diploma of Early Childhood Education

A thesis submitted in fulfilment of the requirements for the degree of

Doctor of Philosophy

Faculty of Education

Monash University

Melbourne, Australia

September 2015

Copyright notice

General declaration

In accordance with Monash University Doctorate Regulation 17.2 Doctor of Philosophy and Research Master's regulations, the following declarations are made:

I hereby declare that this thesis contains no material which has been accepted for the award of any other degree or diploma at any university or equivalent institution and that, to the best of my knowledge and belief, this thesis contains no material previously published or written by another person, except where due reference is made in the text of the thesis.

This thesis includes two original papers published in peer-reviewed journals, one accepted for publication and three unpublished papers. The core theme of the thesis is safety and risk conceptualisation in preschool children. The ideas, development and writing up of all the papers in the thesis were the principal responsibility of myself, the candidate, working within the Faculty of Education under the supervision of Professor Marilyn Fleer.

The inclusion of co-authors in chapters 4 and 9 reflects the fact that the work came from active collaboration between researchers and acknowledges input into team-based research.

In the case of chapters 4 and 9, my contribution to the work involved the following:

Thesis chapter	Publication title	Publication status*	Nature and extent of candidate's contribution
4	A cultural-historical construction of safety education programs for preschool children: Findings from SeeMore Safety, the pilot study	Published	80%
9	Better than bubble wrap: Do we "over regulate and over protect" children at the expense of them learning how to "take risks"?	Published	90%

I have renumbered sections of submitted or published papers in order to generate a consistent presentation within the thesis.

Signed: [redacted] 18 May 2015

Published journal papers

O'Neill, S., Fleer, M., Agbenyega, J., Ozanne-Smith, J., & Urlichs, M. (2013). Developing effective safety education programs for children: Findings from 'SeeMore Safety', the pilot study. Australasian Journal of Early Childhood, 38(2), 74–84.

O'Neill, S., & Fleer, M. (2015). Better than bubble wrap: Do we 'over regulate and over-protect' children at the expense of them learning to 'take risks'? *Asia-Pacific Journal of Research in Early Childhood Education, 9*(1), 111–127.

Journal manuscripts accepted for publication

O'Neill, S. (in press). Safety risk intelligence: Children's concept formation. *Australasian Journal of Early Childhood*.

Journal manuscripts submitted for publication

O'Neill, S. (2013). Safety Education Programs for Early Childhood Learners Matter: Findings from SeeMore Safety, the main study.

O'Neill, S. (2014). A child's voice on safety: Empowering children to influence positive safety behaviour in themselves and others.

O'Neill, S. (2015). Safety risk assessment model: Concept formation of safety and risk.

Peer-reviewed national and international conference papers

O'Neill, S. (2007). *Developing 'risk intelligence' in children through education at an early age to manage their own safety*. Paper presented at the 4th Asian Regional Conference on Safe Communities, Bangkok, Thailand, November.

Prosser, L., Chakaodza, R., Stevens, M., & O`Neill, S. (2007). *School safety clubs as an injury prevention strategy for primary schools*. Paper presented at the 4th Asian Regional Conference on Safe Communities, Bangkok, Thailand, November.

O'Neill, S. (2008). *Developing safety risk intelligence in children*. Paper presented at the 17th International Safe Communities Conference, Christchurch, New Zealand, 20–23October.

O'Neill, S. (2008). *Developing risk management skills in children through education*. Paper presented at the MERC Conference, Monash University, Melbourne, Vic, June.

O'Neill, S. (2009). *Developing safety risk intelligence as a continuum of learning*. Paper presented at the Safety Institute of Australia Conference, Exhibition Centre, Melbourne, Vic.

O'Neill, S. (2009). *Developing safety risk intelligence as a continuum of learning*. Paper presented at the Queensland Safety Conference, Exhibition Centre, Brisbane, Qld.

O'Neill, S. (2009). *Developing effective safety education programs for children: SeeMore Safety, the Pilot Study*. Paper presented at the 2009 Injury Prevention Conference, Melbourne, Vic.

O'Neill, S. (2009). *Developing safety risk intelligence as a continuum of learning*. Paper presented at the School Safety Conference, Nudgee, Qld.

Acknowledgements

Loving thanks to my family for being so patient and tolerant, especially my amazing husband, Brett, and our children, Matt, Emma, Ben and Kate, who allowed me the freedom to have lots of uninterrupted time with understanding.

I warmly acknowledge my principal supervisor, Professor Marilyn Fleer, and co-supervisors, Dr Joseph Agbenyega, Professor Joan Ozanne-Smith and Dr Janette Ryan, all from Monash University. It was a privilege and challenge to have a balance of education and scientific thinkers that provided strong support and guidance. Extra special thanks to Marilyn, who so patiently encouraged, inspired and kept me motivated through the frustrating times. Marilyn so often gave generously of her time, took a real interest in the research and co-authored several papers. Her support for my research has energised me and enabled me to grow over time with confidence.

My sincere gratitude to the teachers and families that gave up their very valuable time to participate in the research. The parents went beyond attending focus group sessions and completing questionnaires, becoming so receptive by incorporating the preschool program into their daily lives. A big thankyou to the beautiful children from the participating preschools for sharing in the "SeeMore" journey.

Thanks to my professional friends and the staff of KIDS Foundation, who have not only helped me realise the value of my work, but also continued the passion and furthered the commitment to reducing childhood injury and death. They share in the endeavours, ideas and desires to make a difference to the lives of young children.

Loving thanks to a group of dear friends that have taken an interest in the topic and have been a sounding board for my thoughts, especially Phil, who gave me so much encouragement, but sadly passed away before he had a chance to read my thesis.

Thank you to Brenton Thomas from Fresh Eyes Australia who provided editing assistance in accordance with the requirements of the *Guidelines for Editing of Research Theses* which form part of the Australian Standards for Editing Practices.

Finally, thank you to all the children who have come into our lives at the KIDS foundation. They are the most inspirational and courageous young people who have suffered trauma and injury that most of us could not imagine. They inspire us to continue our work to discover cost-effective measures for preventing childhood injuries.

Dedication

In March 2006 I began this nine-year PhD journey, the same month my first grandson was born. It is now time to be the devoted grandmother I always hoped I would be to my adorable grandchildren, Bailey, Chase and Nellie, to whom I dedicate this PhD thesis.

Table of Contents

List of Figures

List of Tables

Abstract

Injury is the leading cause of death and disability of Australian children, greater than any illness or disease, yet it is rarely at the forefront of child health programs. Part of the reason the childhood injury problem has not been brought to the public's attention is that it is hidden behind the global success in reducing deaths from illness and diseases. In some cases this has made the childhood injury problem more pronounced which in turn has stimulated the momentum in childhood injury prevention.

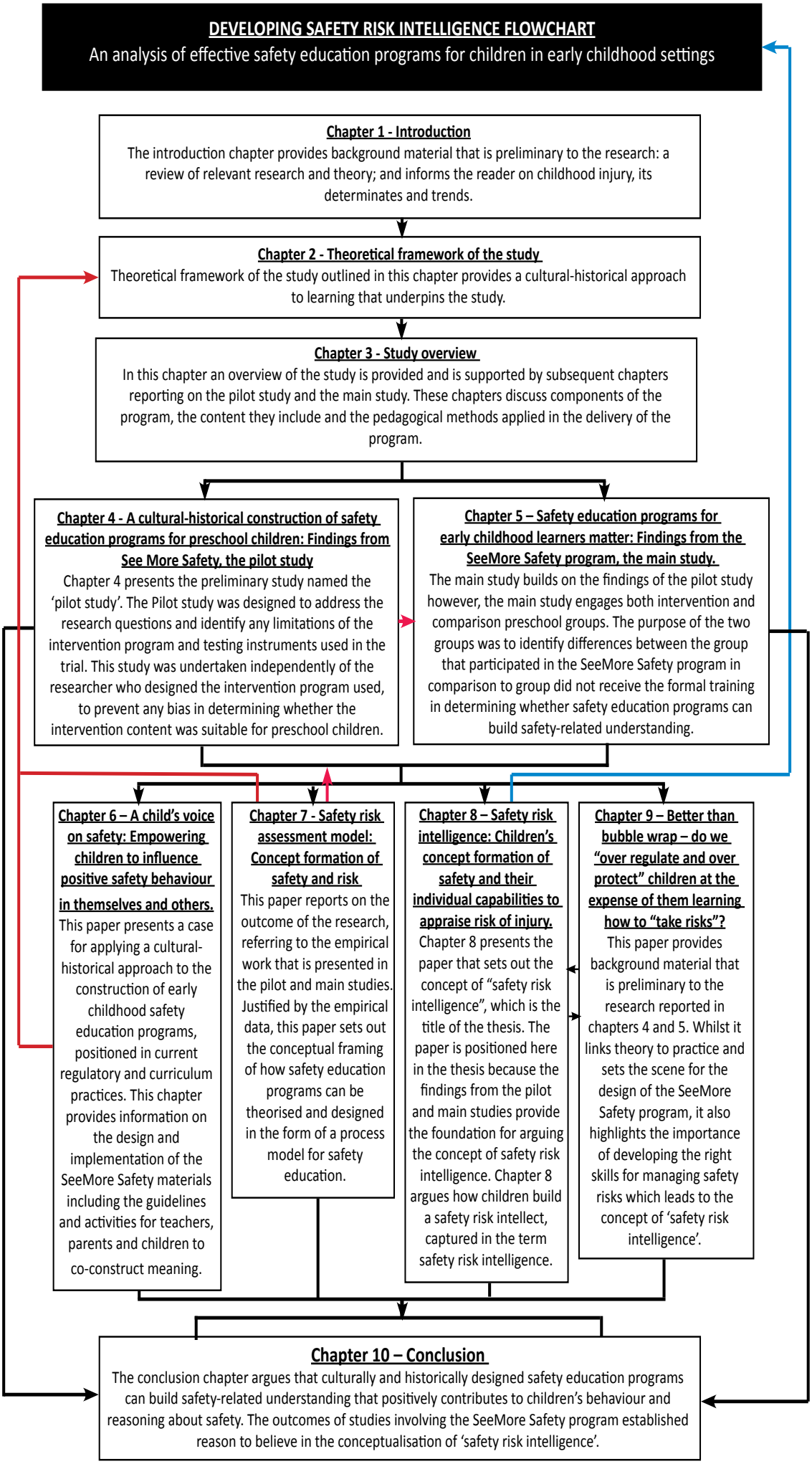
Strategies to reduce childhood injuries generally have focused programs and policies that target discrete specific risk factors and safety. Initiatives that involve making physical changes such as hot water tap temperature regulators, stair guards and fencing around swimming pools have been effective. However, approaches viewed by issue rather than holistically tend to be independent of strategies that provide children with a sense of agency in their safety learning. There appears to be an absence of studies examining a "collective risk intelligence" as a form of safety capacity building.

In drawing upon cultural-historical theory, this study sought to examine the effect on preschool children's behaviour and reasoning about safety as a result of participation in a program called "SeeMore Safety". This study addresses a notable gap in the literature on this important issue. Early childhood education has the potential to play an important role in shaping a child's sense of safety. However, injury prevention approaches at the preschool level have generally targeted parents in the education process where the child is a passive recipient. Findings from this study suggest that when children are given the right learning opportunities and experiences, they can build *safety risk intelligence* that equips them with capabilities they need to become competent risk-takers and manage their safety in everyday life and activities.

When considered together, the papers demonstrate the important role children play in their safety learning, where the term safety risk intelligence is introduced to capture children's agency, and through this concept make a significant contribution to the uncharted terrain within the field of child safety.

Key words: Childhood safety, injury risks, unintentional injury, early childhood education, preschool, cultural-historical.

Thesis Flowchart



Chapter 1

Introduction

Historical Synopsis

A personal, long-term interest in child safety education programs first arose from a visit to a local aged-care rehabilitation centre in the 1980s, where I witnessed young children staying in the facility. After meeting a 12-year-old boy who was sharing a ward with three men in their nineties, it became apparent that there was a gap in the current services provided within the community; a new, separate program was needed to care for young people requiring rehabilitation.

In Australia at the time, if a child were unable to be rehabilitated at home after a serious injury, then an aged-care centre was the only facility available for the child's rehabilitation. As a result of these experiences, the KIDS Foundation was established in 1993 as a health promotion charity dedicated to childhood injury prevention and injury recovery.

The organisation exists to deliver educational programs aimed at developing responsible safety risk management life skills in children, and provide support and care for children who have sustained a serious life-changing injury or burn. The first major project of the organisation was the opening of a child-friendly rehabilitation centre, which now supports more than 500 children each year through the provision of rehabilitation services and therapies.

Having a teaching background, I was curious about the number of children injured in Australia and Australia's approach to childhood injury prevention. The KIDS Foundation's injury prevention program was established with support and advice from the then Victorian Education Department, along with other government and safety organisations, and emergency services. The program initially operated to provide education delivery services and resources to primary school children. Independent research has found the program to be highly successful in teaching primary school children about personal safety and contributing to a reduced incident of childhood injury (Prince, 2011).What was of interest to me was how stage or maturational theory of children's development underpinned such programs that in turn framed the conceptualisation of safety and risk being used.

A cultural-historical approach to conceptualising children's development provides a philosophical challenge to the way safety programs in education environments are traditionally managed, as it

positions children to engage in the decision-making processes and for teachers to take an active role in children's development. Many injury prevention programs have tended to focus on modification of the environment or limiting experiences through negative reinforcement (i.e. the "don't" messages) from teachers and parents (Ryan, 2005). Conventional approaches have often failed to combine methods that recognise children's ability to draw on their acquired safety knowledge and skills to more effectively manage a potentially dangerous situation (Heck, Collins, & Peterson, 2001). A cultural-historical approach where safety learning is collaboratively constructed with teachers and parents may prove to be a strategy that is effective in addressing the childhood injury problem that is present in Australia. This doctoral study has been a nine-year process due to the fact that the resources and testing instruments that were developed by the researcher needed to be independently trialled and validated. For this reason, a pilot study was conducted by an independent body in consultation with the researcher for the purpose of informing the main study.

The decision to include published and submitted papers into the thesis content has also added time to the submission process. The time frames of the review process of some publishing companies have been quite lengthy due to the companies requiring more detail from the pilot and main studies' findings. This has created a situation where some parts of the thesis appear to be repetitive, leading to the perception that some concepts may be overemphasised.

Research Purpose

The initial outcomes of implementing a cultural-historical conceptualised program at an upper primary school level over several years have demonstrated that children can acquire knowledge and understanding to responsibly manage their own safety (Prosser, Chakaodza, Stevens, & O'Neill, 2007). The aim of this doctoral study is to systematically investigate whether such an approach is effective at a much earlier age. and, through using a more rigorous evaluation method, determine if it is significantly more effective than other conventional approaches. Shearn (2006) considers safety education for young people as important and believes that it should be introduced at the earliest possible age and stage of development. "Conceiving development as transformation of participation rather than as a product of transmission of knowledge from others" (Rogoff, 1994, p. 209) critically underscores the importance of introducing safety early in childhood. The study uses an intervention program developed by the author entitled "SeeMore Safety". It is a primary resource that examines whether a targeted evidence-based safety education program for preschool children can develop *safety risk intelligence* as a form of safety-related capacity building.

Review of Relevant Research and Theory

Childhood injury. Childhood safety is an international concern that has prompted health and educational professionals to explore strategies to reduce injury rates arising from unsafe practices. Despite the fact that there has been a reduction of some types of childhood injuries in many countries, after infancy, unintentional injury remains the leading cause of death and disability in children worldwide (WHO, 2008). These world trends are reflected in Australian statistics with injury in children aged one to fourteen the main reason children are admitted to hospital (National Public Health Partnership [NPHP], 2004). What is known about effective injury prevention and intervention strategies to reduce injury has been well documented in reports by the WHO (2008) and the Australian National Injury Prevention and Safety Plan (NPHP, 2004).

However, child safety and injury prevention strategies have been quite challenged between scientific and academic views (Wyver, Bundy, et al., 2010). The scientific approach to reducing injury rates is based on cause and effect theory whereby injury risk is eliminated by avoidance of the cause (NPHP, 2004). The focus tends to be on programs and policies that target the identification of risk factors and their causes. In line with this theory, attention is drawn to recommendations that suggest the best option is to remove these risks or reduce children's exposure to them (NPHP, 2004). The growing focus on preventative education, risk management and harm reduction built into many aspects of children's leisure activities, home safety, school safety and road safety is commendable and has paid significant dividends. However, there is the potential that these strategies can become counterproductive and have greater negative outcomes than the risk being targeted. For example, the removal of playground equipment that limits activities like climbing and discourages physical activity in children is likely to contribute to the increased risk of childhood obesity. According to Wyver, Bundy, et al. (2010), risks of obesity and chronic illness are increased by the sedentary lifestyles many children are now experiencing. The academic approach where a certain level of personal risk is required for a child's optimal development is supported by Ungar (2007), who argues healthy risk-taking is considered necessary to achieve certain benefits and is an essential component of identity formation.

Children are exposed to injury risks in their everyday lives and although the environments they live in may differ greatly, they are vulnerable to the similar types of injury. To better understand major factors contributing to the childhood injury problem and inform the study this section of the chapter reviews child injury types, causes and statistics where the age categories differ quite considerably.

In the context of this review into the available injury data, the term "childhood" relates to those individuals who are 17 years and under. Another commonly referenced term in relation to a period in childhood is the "preschool child". In this context it is used to refer to a child who attends a preschool or kindergarten, generally aged three to six years.

Injury determinates. Central to the thesis and the core of the topic is injury. The term injury can best be described as "physical harm to a person's body", occurring when humans come in contact with other humans, objects, substances, or other things that can cause the harm (NPHP, 2004). There are varying degrees of injuries, with injury fatalities being the most serious. Non-fatal injuries are often classified by severity: mild; moderate and the very serious, and result in life-changing injuries causing disfigurement and disabilities (Queensland Health, 2007). An injury can be classified as "unintentional" or "intentional"; however, most injuries are unintentional (NPHP, 2004). It is unintentional injury that is of most relevance to the thesis. There are many determinates that influence unintentional injury. This section provides an overview of injury determinates with appreciation of the breadth and complexity of the field.

Injuries are determined by the events and behaviours that precede them and are influenced by the physical environments in which we live, work, play and engage in recreational activities (NPHP, 2004). Whilst lifestyles and behaviour influence injury, it is the choices we make that affect safety, informed by many factors, including cultural background, environments, socio-economic circumstances, gender and age (NPHP, 2004).

Cultural, environmental and socio-economic factors

The cultural contexts of injury determinates are significant, and are defined as acquired knowledge, experience, beliefs, values, attitudes and behaviours that are passed on by generations and which contribute to injury vulnerability. The environments in which people live determine the level of injury risk and opportunities for injury prevention (NPHP, 2004). Worldwide research recognises the significant impact physical and socio-economic environments and cultural backgrounds have on safety (NPHP, 2004; WHO, 2008). Injury risks are unique to every situation and to each community, workplace, school, home and leisure activity because, as they are determined by circumstances specific to their own environments.

There has been an international movement towards injury prevention strategies that promote a collaborative approach such as establishing safe communities. Safe Communities is a World Health

Organization (WHO) initiative, established in Sweden in the 1970s and more formally in 1989. A safe community is defined as:

> one in which all sectors of the community work together in a coordinated and collaborative way, forming partnerships to promote safety, manage risk, increase the overall safety of all its members and reduce the fear of harm. The key feature is the creation of a local infrastructure (i.e. coalition of community business, government and non-government leaders) that combine their resources and interests to address local concerns about injuries, crashes, anti-social behaviour and crime in a coordinated and sustainable manner. A community may be defined as either a delineated geographical area, a group with common interests, professional associations, or the individuals who services to a specific locations (Australian Safe Communities Foundation, 2015).

However, as argued by Moller, geographical boundaries that often define communities do not always conform to the boundaries formed by the social functioning of groups formed within them (Ozanne-Smith & Williams, 1995). He considers the most important factor in defining a community as "the notion of an identification and sharing a feeling of commonality" (Ozanne-Smith & Williams, 1995, p. 212). Therefore the community-based approach identifies and addresses the injury prevention problem as a collective.

It is common that the same prevention strategies are implemented among all population groups. However, consideration must be given to the different societal contexts and norms. For example, with water safety messages, there are significant differences in aquatic environments that may be associated with where communities live. Backyard pools, for instance, are more likely to be found in middle to upper socio-economic groups, which are quite different to inland waterways and dams etc where lower socio-economic groups may be found (Linnan et al., 2012). Approaches to water safety may also be entirely less effective in low socio-economic areas compared to those in high socio-economic areas. For example, the water hazards posed by pools, spas and water features that are often found in high socio-economic communities are significantly reduced by covering and fencing the facilities. Whereas fencing a lake, pond or river accessible to lower socio-economic communities is impractical and may be counterproductive where the use is restricted, and therefore the opportunity to teach water safety skills is limited (Linnan et al., 2012).

The pattern and types of injuries and their long-term effects vary within communities and countries. Years of childhood injury research have identified the types of injury and factors that are specific to

environments and groups of children within communities who are most at risk (WHO, 2008). According to the WHO (2008), data obtained worldwide, has identified indigenous populations and other groups that experience greater poverty, such as refugees and the homeless, as having higher than average rates of injury. Similar trends are apparent in Australia, with injury death rates in Aboriginal and Torres Strait Islander people 2.8 times higher and hospital admissions twice as high than for other Australians in the period from 1997 to 2000 (Helps & Harrison, 2004; Lehoczky, Isaacs, Grayson, & Hargreaves, 2002; NPHP, 2004). The higher rates of injuries and death experienced by Aboriginal and Torres Strait Islander people are due to problems and lifestyles within the communities (NPHP, 2004). Similar factors relating to high injury rates apply to other culturally and linguistically diverse communities and lower socio-economic groups (NPHP, 2004).

There is a growing body of evidence to suggest socio-economic circumstances impact greatly on risk of injury to children. According to Clapperton and Cassell (2009), social factors such as residential location and socio-economic status are causes of premature death and illness. The groups living in chronic poverty were reported by the WHO (2008) to be the most vulnerable groups. Economic factors, including family income and structure, and social factors such as maternal education and a lack of supervision of children, were identified as major contributors to risk of injury (WHO, 2008). An Australian study conducted in New South Wales, found an association between low socio-economic groups and non-fatal injury risk among children, with transport-related injuries, burns and poisonings discovered to have the strongest connection (Reading, 2008).

Gender and age

According to the WHO (2008), boys have more frequent and severe injuries than girls, and in children under 15 years, boys on average have 24% more injury deaths than girls. Patterns of gender difference related to injury rates in Australia reflect those of global findings. Australian data reveals males have higher rates of injury than females between 0 to 24 years of age (NPHP, 2004). Between 1999 and 2003, 62% of childhood injury deaths in Australia were boys (Australian Bureau of Statistics [ABS], 2006). Injury hospitalisation for males in Australia increased with age, almost doubling from childhood to the age group 20 to 24 (NPHP, 2004). Clapperton, Cassell, and Wallace (2003) reported similar findings in Victorian schools, where males represented 56% of injury cases in primary schools and 70% of injuries at the secondary school level.

There have been various theories proposed and investigated to explain gender differences in risk-taking. Ideas such as boys engage in more risk-taking activities and behave more impulsively than

girls (Morrongiello & Rennie, 1998; Rosen & Peterson, 1990), and that boys socialise in different ways to girls (Eaton, 1989).

In a study conducted by Zuckerman (2000), Australian participant males were found to be more likely to engage in thrill and adventure type activities than females. This data was supported sometime earlier by the findings of Ball, Farnhill, and Wangerman (1984), who discovered males, overall, showed higher sensation-seeking scores than females. According to Zuckerman (2007), females tend to judge the level of risk higher than males do. Gender is also considered a factor in risky driving. Zuckerman (2007) found in nearly every gender-compared study that males are riskier drivers than females and have more accidents. Another interesting concept to consider when comparing gender in relation to injury rates is the factor of supervision of children. The WHO (2008) suggests that, in general, boys were found to have more freedom to explore and roam further than girls, and were less likely to be restrained by parents.

The types of injury common to gender are frequently reported in age groups. Like gender-associated injuries, other factors impact on age, such as physical and mental capabilities and exposure to risk (Pointer, Harrison, & Bradley, 2003). Data suggests injury frequency, causes and severity vary with age; however, the concept of developmental stages and individual differences acknowledges that age in relation to injury is more complex than previously thought (Pointer et al., 2003). Age reflects various stages of life, influenced by individuals' capabilities, experiences, knowledge, circumstances, activities and the opportunities presented to them (NPHP, 2004).

There is a common trend in research to report on findings using age as the prevailing classification, particularly in relation to injury (NPHP, 2004; Ozanne-Smith & Williams, 1995; Safe Kids USA, 2009; WHO, 2008). Although the data representation highlights children's risk of injury varying with age, it is difficult to compare injury rates across all age groups due to the complexities of risk exposure with developmental level. For example, a young child is less likely to ride a bike on a road than an older child, and is therefore exposed to different risks.

Within the field there appears to be variation, inconsistency and minimal control over injury data collection and interpretation methods, which raises questions regarding the reliability of injury data analysis. Harrison (1995) suggests that there are a number of technical aspects that need to be considered when setting the criteria around interpreting and analysing injury data. Inconsistency in data collection detail, as it relates to injury, appears to vary according to severity. Injury deaths seem to be more thoroughly reported than injury-related hospital admissions and are even less detailed for

hospital presentations and doctors' consultations. In most cases, references to injury only include the physical aspects of injuries and their severity; however, there are often emotional and psychological consequences related to injuries that are not reported (Queensland Health, 2007).

Childhood injury trends. This section provides an overview on childhood injury trends that are presented using age and issue as important criteria, based on the data and statistical information available, which in many cases is quite dated. Injury prevention literature tends to be largely data driven and reflects the peak age groupings at which certain types of injuries occur (e.g. arm fractures due to falls from playground equipment peak in the 5–9 years age group). The association between injury and age presents a different approach to the theoretical view of child development expressed in this thesis (i.e. cultural-historical rather than maturational). However, contemporary theories of child development and the biologically and environmentally determined vulnerabilities of young children do cross paths. Whilst there is common ground here with mainstream injury prevention theorists who promote safe systems, this is generally with strategies that have less opportunity for harm due to individual "error" rather than forms of safety capacity building through learning programs. The data that reflects the types of injuries that occur in peak age groupings also indicates the injury risks to preschool children and therefore is important in informing the study.

In 2002, more than 700,000 children under the age of 15 were killed by an injury, and for every injured child who died, several thousand children lived with varying degrees of disability as a result of injury (WHO, 2008). A substantial proportion of these injuries and deaths, including falls, burns and drowning, occur in either the home or in leisure environments (WHO, 2008). In all age groups between one and 14 years, injuries emerged as the leading cause of death, accounting for 41% of all childhood injury deaths (ABS, 2006). Transport accidents caused the greatest proportion of these deaths, where the child was either the occupant of a motor vehicle or a pedestrian (ABS, 2006; AIHW, 2005). Drowning was the second most common cause of death, accounting for 19.4% of all child injury deaths between 1999 and 2003 (ABS, 2006).

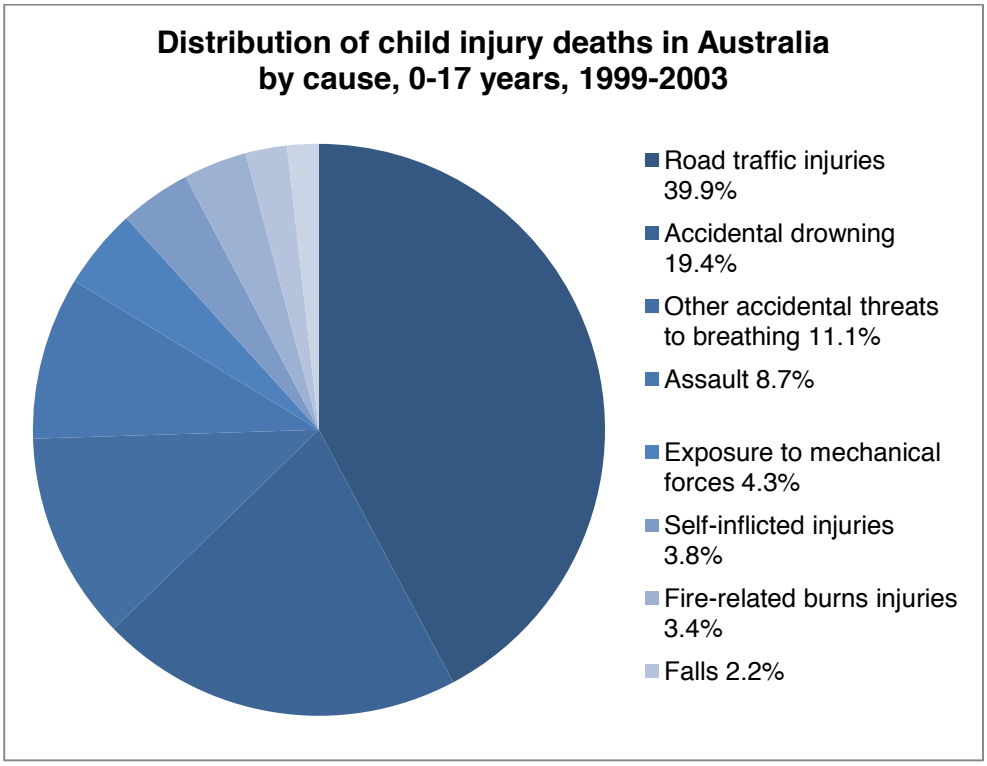


Figure 1.1. Distribution of child injury deaths in Australia, 0–17 years, by cause, 1999–2003. Source: ABS (2006), Year Book Australia, 2006

Figure 1.1 is a representation of the distribution of childhood injury deaths by cause in Australia during the period 1999 to 2003. There is a consistent pattern in the causes of both injury deaths and hospital admissions in Australia reflected in the statistics from 1999 to 2006 (ABS, 2006; AIHW, 2005). In Australia, during 2002 and 2003, there were 68,000 hospital admissions of children aged 0 to 14 years for injury (ABS, 2006). However, the types of injury varied with falls the leading cause of non-fatal injuries for children 0 to 14, accounting for 61% of all injuries. Collisions were the second most common cause, accounting for 17% of non-fatal childhood injuries (ABS, 2006).

In Victoria, causes of injury deaths, hospital admissions and presentations were also consistent with national trends as demonstrated in Table 1.1. Transport injuries were the leading cause of injury-related childhood deaths followed by drowning, whereas falls were the leading cause of childhood hospital admissions and presentations.

Table 1.1

Summary Rank Order of Major Causes of Child Injury (by Frequency), Victoria 2001.

Rank	Deaths (n=36)	%	Hospital admissions (n=13,401)	%	Hospital ED presentations (n=49,070)	%
1	Transport, mostly car occupant	47	Falls, predominantly playground equipment	45	Falls	40
2	Drowning	11	Transport, predominantly bicyclists (on and off road)	13	Struck by/collision with, predominantly objects	7
3	Hit/struck/crush	11	Hit/struck/crush, mostly struck by objects	12	Cutting/piercing	5
4	Choking/suffocation	8	Poisoning	6	Transport, predominantly bicyclists	3
5	Homicide	8	Cutting/piercing, predominantly foreign body or object entering through skin	5	Natural environmental, predominantly other animals and dogs	3

Note. From Clapperton, A., Ashby, K., & Cassell, E. 2003, *Hazard, 54*. p. 15.

The trend has continued in subsequent years. In Victoria, over a three-year period from 2003 to 2005, 103 children died, 38,553 children were admitted to hospital and 166,229 children were presented to hospital emergency departments for unintentional injury.

Although this injury data is now quite outdated, it remains relevant because it informed the study content at the time of its conception. In the years since 2001, the trend has continued, with transport, drowning and falls remaining the most common forms of injury (AIHW, 2014). Of all the causes of injury during the period of 2011 and 2012, unintentional injuries accounted for 38%, the most common of hospitalised injury among children and young people. This more recent data is detailed in Table 1.2 (AIHW, 2014).

Table 1.2

Major External Cause Groups for Hospitalised Injury Cases in Children and Young People, 2011–12.

	Males		Females		Persons		
External cause	Number	%	Number	%	Number	%	M:F ratio
Unintentional injuries							
Transport	13,303	15.2	5,836	13.0	19,139	14.5	2.3
Drowning and submersion	193	0.2	100	0.2	293	0.2	1.9
Poisoning, pharmaceuticals	1,143	1.3	1,142	2.6	2,285	1.7	1.0
Poisoning, other substances	489	0.6	321	0.7	810	0.6	1.5
Falls	24,684	28.2	13,463	30.1	38,147	28.9	1.8
Thermal causes	1,806	2.1	1,037	2.3	2,843	2.2	1.7
Other unintentional causes	36,863	42.2	13,693	30.6	50,556	38.2	2.7
Intentional injuries							
Intentional self-harm	2,450	2.8	6,426	14.4	8,878	6.7	0.4
Assault	5,485	6.3	1,825	4.1	7,310	5.5	3.0
Undetermined intent	906	1.0	864	1.9	1,770	1.3	1.0
Total[(a)]	87,426	100	44,770	100	132,198	100	2.0

(a) Includes other external causes of injury and not reported (167 cases)

Note. From AIHW: Pointer S 2014. Hospitalised injury in children and young people 2011–12. Injury research and statistics series no. 91. Cat. no. INJCAT 167, p. 12.

Falls were reported as a dominant cause of unintentional injury for both males and females, with transport injury following other unintentional causes (AIHW, 2014). Falls prevailed across all age groups; however, the types of falls differed according to developmental stage. This is the case with all causes of injury, varying immensely by developmental age. Generally, higher rates of drowning are found in younger children while unintentional transport injury is found in older children and young people as detailed in Table 1.3 (AIHW, 2014).

Table 1.3

Proportion of High Threat to Life[(a)] Cases by Major External Cause Groups, by Age Group, 2011–12 (Per Cent)

	<12 months	1–4	5–9	10–14	15–17	18–24	Total
Unintentional injuries							
Transport	22.5	13.3	12.0	11.7	20.5	22.2	18.7
Drowning and submersion	100.0	98.7	96.4	60.7	63.6	71.1	89.4
Poisoning, pharmaceuticals	0.0	0.2	1.6	0.0	0.5	0.9	0.5
Poisoning, other substances	0.0	3.4	2.3	5.2	6.9	3.6	3.7
Falls	18.8	3.1	2.4	4.2	6.7	7.8	4.8
Thermal causes	6.1	8.6	9.5	7.4	17.6	14.3	10.7
Other unintentional causes	22.5	2.9	2.1	2.1	2.4	2.1	2.6
Intentional injuries							
Intentional self-harm[(b)]	n.p	n.p	n.p	5.2	3.4	4.5	4.2
Assault	31.0	21.1	6.9	9.6	12.7	16.0	15.4

(a) High threat to life cases defined as ICISS <0.941 (Stephen et al. 2003).

(b) High threat to life cases for children under 10 years of age not reported.

Note. From AIHW: Pointer S 2014. Hospitalised injury in children and young people 2011–12. Injury research and statistics series no. 91. Cat. no. INJCAT 167, p. 17.

Road and transport

Whilst most of the transport related injuries where fatalities recorded were vehicle related, bicycles became a significant factor in non-fatal injuries to children. In Victoria alone, in each year averaged over the three-year period 2003 to 2005, cycling injuries accounted for one childhood death, 753 childhood injury admissions and 2407 childhood injury emergency department presentations (Cassell & Clapperton, 2007). The majority of children were injured when falling off a bike and hitting the ground (Cassell & Clapperton, 2007). Helmet use has been significant in providing an estimated 63% to 88% reduction in injuries to the head and brain for all ages of cyclists (Cassell & Clapperton, 2007; Thompson, Rivara, & Thompson, 1999). Other contributing factors to bicycle injury risk identified by Cassell and Clapperton (2007) included children's behaviour in traffic, driver behaviour, and the design and operation of the road environment together with vehicle design.

Drowning

As reported above, drowning is another common cause of injury-related deaths in Australian children aged under 14 years (NPHP, 2004). As demonstrated in Figure 1.1, for the period between 1999 and 2003, accidental drowning was the second most common cause of childhood injury deaths in Australia, accounting for 19% of all child injury deaths (ABS, 2006). Swimming pools were the most common location for drownings of one- to 14-year-olds, followed by a body of natural water – either a lake, river, stream or the sea (ABS, 2006).

Falls

Falls were the most common cause of childhood injury, accounting for 43% of all injuries to children in Australia (NPHP, 2004). According to the ABS (2006) in 2001, 11% of all Australian children aged between 0 and 14 years were injured in a fall. Ninety-three per cent of children injured in falls fell from a height of one metre or less, and 7% from more than one metre. Of these fall injuries, 75% occurred when children were engaged in sporting or leisure activities (ABS, 2006). The top five factors contributing to childhood falls, accounting for approximately one in five hospital admissions and presentations, included bikes, monkey bars and in-line/roller skates (Ashby & Corbo, 2000). Steps and stairs were a common factor in all age groups (Ashby & Corbo, 2000).

Based on injury locations that have been recorded and statistics provided by the ABS (2006), the most common locations where children aged five to 14 years in Australia received injuries were 48% around the home (32% outside and 16% inside), 30% at school and 20% at a sports facility (ABS, 2006). Among the 498,000 children in this age group who reported being injured, most had been undertaking leisure activities, which included playing both organised and non-organised sport or games at the time of injury (ABS, 2006).

What is relevant in this section is that children continue to suffer serious life-changing injury and death at significant rates. The overview of childhood injury determinates that has been briefly covered provides an understanding of the nature of injury risk to Australian children. However, a thorough discussion of injury determinates is beyond the scope of this thesis due to the wide range of material available and inconsistencies with injury data collection and analysis. Whilst the data presented reflects the types of injuries that occur in peak age groupings, what is relevant to this study is the preschool child's relationship to the material and social worlds and the associated risks.

The following section of this chapter presents a theoretical discussion on child development, paying respect to how safety has been conceptualised by a range of theoretical traditions. A brief critique of three dominant theories of child development that underpin early childhood education in Western communities is presented, followed by consideration of these theories within the landscape of child risk and safety conceptualisation. There is a focus on cultural-historical theory because it will be argued it is supportive of the ways in which children acquire knowledge and understanding in relation to managing safety-related risks through shared-learning programs.

Theoretical perspectives on children learning. Education and child injury fields have predominantly used age as one of the important criteria for classifying childhood development and childhood injuries. However in contrast to age which positions development from a maturational and biological viewpoint, a perspective grounded in a cultural-historical theory is considered where it is the child's relationship to the social and material worlds that is central to the learning process. Developmental and post-developmental theories of child development are explored in this section in order to guide our thinking on how they can inform contemporary research into safety.

As argued by Agbenyega (2009), who draws upon Damon (1998), the past century has been dominated by three prominent ways of thinking about child development and refers to these as the "three grand systems" based on the biological perspective of Gesell; the maturational, biological and psychoanalytical learning theory of Piaget; and Vygotsky's cultural-historical theory. A summary of these theories is presented in the Figure 1.2.

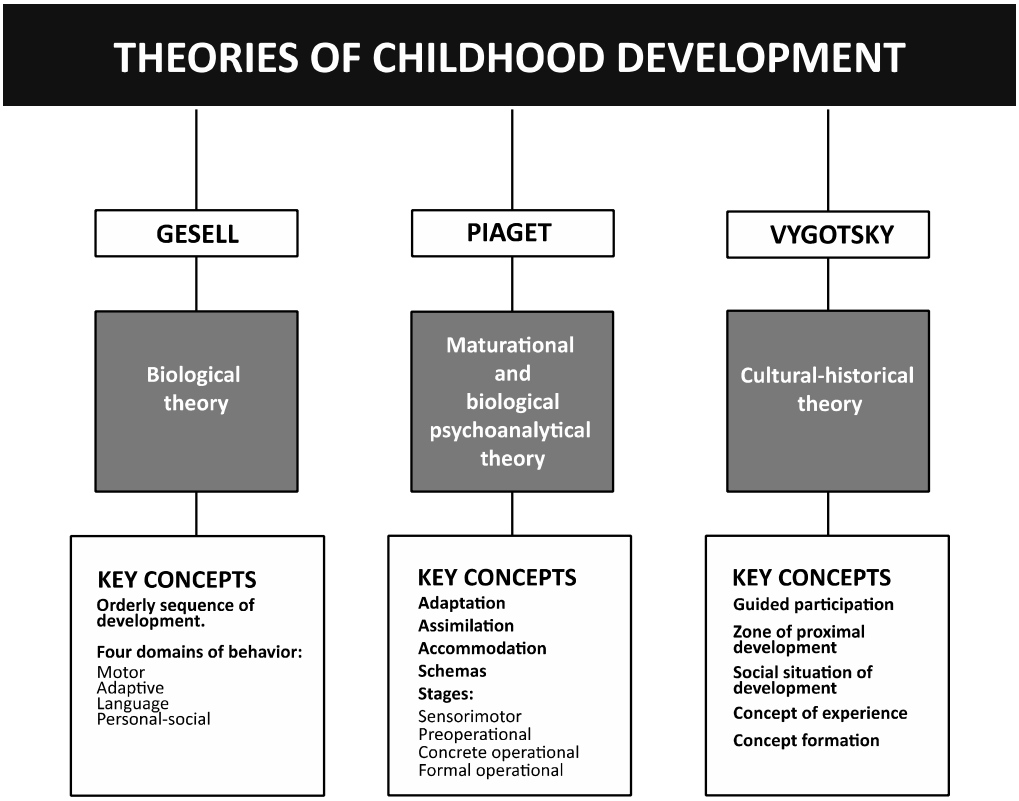


Figure 1.2. A summary of three grand theories

These three grand theories have played an important role in shaping educational practices and views of child development and measurement of readiness for learning. The theories of Gesell and Piaget are introduced briefly as background because much of the literature in childhood safety draws upon their work for conceptualising child development.

Maturational and biological theories of Gesell. Arnold Gesell (1880–1961), an academic researcher well known in the field, devised theories of child development based on genetic influences. He emphasised the importance of maturation in development and argued that biological factors were the main determinants of development (Gesell, 1933). Gesell (1933) believed maturation followed in a preordained sequence, that a child's growth and behaviour patterns were predictable with few individual differences, arguing children follow the same progression of development (Gesell, 1933). According to Fleer (2009), Gesell sought to construct periods of childhood development based on "the rhythm and tempo of the child at particular ages" (Fleer, 2009, p. 161). Gesell (1946) argued that the total developmental process works within an orderly

sequence described within four domains of behaviour: motor, adaptive, language, and personal-social.

Whilst Gesell recognised the influence of external factors, he did not consider the environment as an important factor in progressing development (Gesell, 1933). He states: "Environmental factors support, inflect and modify, but do not generate the progressions of development" (Gesell, 1933, p. 295). This implies that what a child can physically and mentally do is predetermined by this orderly sequence without consideration of the child's cultural background. Fleer (2009) suggests that Gesell's theory on a naturally evolving process did not recognise qualitative changes in development, but rather followed a regular pace representative of age change. Whilst educational theorists have challenged Gesell's theory of child development, according to Dalton (2005), many psychologists have also been critical of Gesell's concept of childhood stage development. However, Dalton (2005) believes Gesell's work continues to "stand the test of time".

Maturational, biological and psychoanalytical theories of Piaget. Renowned for his work on childhood cognitive development, Jean Piaget (1970) put forward a theory of maturation and biological perspective on how children learn. Like Gesell, Piaget perceived cognitive development as predominantly biological (Agbenyega, 2009; Kincheloe, 2008). He argued that maturation determined cognitive development (Piaget, 1929).

One of Piaget's key concepts was the function of thought-facilitating adaptation (O'Donnell et al., 2012). O'Donnell et al. (2012) explain adaptation "as adjusting to the demand of the environment" (p. 100). Piaget (1929) argued that individuals construct their own knowledge through interaction within their environment. According to Piaget (1929), adaptation occurs through the cognitive process of assimilation and accommodation. Piaget (1929) suggested that the learner needs "twin processes of assimilation and accommodation to generate knowledge" (Anning, Cullen, & Fleer, 2004, p. 45). "Assimilation", according to Piaget (1929), is a situation where children use their existing level of knowledge to experience and comprehend the world. Whereas "accommodation" is used to explain the transformation or modification to the way children think in response to new experiences (Agbenyega, 2009; Berk, 2006). In accommodation, the modification of schemas (the basic structure for organising this information) occurs when low-level schemas transform into high-level schemas (O'Donnell et al., 2012). For example, a child may have schemas for a drink associated with a baby's bottle, but when given a cup, the child would either modify or create a new schema.

Piaget identified three types of schemas: behavioural schemas, which are mental representations of physical actions such as grasping and kicking; symbolic schemas that are language-based representations of objects and events; and operational schemas, which are mental actions to solve problems or to reason logically (O'Donnell et al., 2012). According to Piaget (1971), if existing schemas are not confirmed by experience, a state of cognitive conflict occurs; this he refers to as "disequilibrium".

Piaget (1929) argued that children develop in a structured sequence of stages, each very different from the other: sensorimotor, preoperational, concrete operational, and formal operational (Ginsburg & Opper, 1988). According to Ginsburg and Opper (1988), all of the four age-related stages considered the individual's interaction between maturation and environment and ability to adapt. The developmental stages theorised by Piaget (1970) conceptualised all children as passing through them, and each stage was associated with an increase in acquired knowledge and understanding. He argued that children could not undertake certain tasks unless they were psychologically mature enough to do so (Piaget, 1929).

Piaget's contributions to learning theory have influenced many educational programs in schools; however, a number of Piaget's key theories have been questioned by many theorists (Cole & Wertsch, 1996; Crewe & Zola, 1983; Renshaw, 1992). New ideas about cognitive development and educational practice have identified several limitations of Piaget's theories: the underestimation of intellectual capabilities, where children have shown greater problem-solving skills; cognitive development being qualitatively different for children of different ages; discovery-based learning is not as effective as guided discovery; and the absence of culture and social influences on cognitive development (O'Donnell et al., 2012).

Although much research has attempted to determine age-related skill development, it has been challenged, even by Piaget and Gesell themselves, who noted that development does vary and does not always progress smoothly (Gesell 1933; Piaget, 1970). Classifying children into age-related stages of cognitive development, suggests children of the same age have the same capabilities despite their individual differences. Therefore this staged approach to theorising child development implies that children could not undertake tasks unless they were of a certain age. This is in contrast to the view put forward on safety conceptualisation argued in this thesis. My study aims to determine if improved safety knowledge is due to more than a maturation developmental process,

hypothesising that through participation in appropriate intervention programs safety learning can be advanced.

Another limitation to Piaget's theory of child development has been the approach to learning known as discovery-based learning theory, which is contrary to the shared-learning approach employed in the early learning injury prevention program used in this study. Cultural-historical theory captures the key methods that underpin the conceptualisation of safety intervention program. In this program, children are introduced to concepts that support them with developing conscious understanding about safety so that they have agency.

A further limitation of Piaget's theory concerns not recognising the diversity of individuals in their social and cultural contexts. Piaget did not give consideration to cultural difference in childhood development (Agbenyega, 2009; Piaget 1929; White, Hayes, & Livesey, 2005). The role of social guidance in situations where children develop skills to read, cook, plan and build something, which are socially mediated, were not acknowledged in Piaget's work (O'Donnell et al., 2012). Agbenyega (2009), who draws upon White, Hayes, and Livesey (2005), argued that Piaget's theory portrayed "child development as occurring linearly and universally in stages across all cultures" (p. 32).

Both Piaget and Gesell's theories limit the possibility of safety learning because the child's social and material worlds are critical to developing safety knowledge. These are not considered in a maturational- and biological-based view of development. According to Rogoff (2003), the appropriateness of different approaches to tasks depends on how maturity and intelligence are considered in different communities. For example, in New Guinea, infants handle knives by the time they are able to walk, whereas in the USA, they are not trusted with knives below the age of five (Rogoff, 2003).

A cultural-historical approach offers a different perspective to the limitations that Piaget and Gesell's theories pose in learning, recognising that different communities have different expectations of children, and these, in turn, mean children grow up with different experiences and understandings. These understandings are important for a study focused on childhood safety.

Cultural-historical theories of Vygotsky. Vygotsky (1962, 1987), who was the originator of cultural-historical theory from early in the twentieth century, thought differently to Piaget. Although Vygotsky recognised that there were maturational prerequisites for particular cognitive achievements, he believed that maturation did not totally determine development (Bodrova &

Leong, 2007). Piaget's maturational theory has been criticised for neglecting the social background of the learner, whereas Vygotsky's (1962) theory signified the importance of the social context. Unlike Gesell and Piaget, Vygotsky (1962) considered a learner's interaction with the environment as important for their development.

Vygotsky has contributed a wealth of respected knowledge to the field of philosophy and psychology. His theories were influenced by Marx and Engels and inspired by Hegel, Spinoza and Feuerbach (Daniels, Cole, & Wertsch, 2007). Vygotsky's theories have been useful in connecting individuals' thinking with cultural traditions, for instance in schooling and literacy (Rogoff, 2003). Vygotsky's work includes a wholeness approach to understanding the child's development through the complexities of the child's social situation (Fleer, 2010). In this context, "the whole – the individual and the collective – has to be conceptualised together" (Fleer, 2010, p. xi). This implies that the child's social, material and cultural worlds should be included in understanding childhood development. Vygotsky argues that an individual's development must be understood in the context of the kinds of activities and the kinds of institutional practices in which the learner engages (Rogoff, 2003).

Vygotsky's theory of child development incorporates many key concepts. According to Karpov (2005), these concepts need to be considered in a holistic context, not as a set of separate ideas. Concepts of "guided participation", "zone of proximal development", "social situation of development", "concept of experience" and "concept formation" interrelate as basic components of Vygotsky's holistic theory (Fleer, 2010; Vygotsky, 1987). However, like many of Vygotsky's ideas, the concept of social situation of development was never fully developed or researched due to his untimely death (Bodrova & Leong, 2007; Fleer, 2010).

The works of Vygotsky (1929, 1987, 1978) and those that followed – Leontiev (1964, 1978), Elkonin (1972), Kozulin (1990) and Zaporozhets (1997) – continue to offer understandings of the elements of students' learning that are complementary to the work of more recent cultural-historical and socio-cultural theorists such as Rogoff, Wertch, Daniels, Cole, Anning, Cullen and Fleer. These theories give prominence to the importance of the social and cultural contexts of learning that underpin this study, and these concepts are discussed more thoroughly in the following chapter.

The theoretical and conceptual framework outlined in the next chapter provides a cultural-historical approach to learning that underpins both the study and the intervention program. It is thought that

cultural-historical theory is instrumental in shaping a child's sense of safety, and extends their ability to manage injury-related risks.

Injury prevention programs. The introduction of safety education programs at the preschool level has been adopted internationally by the non-government organisation Safe Kids (www.safekids.org). However, scientific evaluations of such programs are rare. Shearn (2006) claims that although styles of safety education programs may vary, they all have three basic objectives: to raise safety awareness; to develop risk management skills; and to modify behaviour. When brought together, these three fundamental objectives presented by Shearn (2006) provide an educational strategy for developing safety understanding and addressing childhood injury.

Conventional approaches to safety education in Australian preschools and primary schools have tended to focus on teacher supervision and modification of the physical environment, where little recognition is given to the role children play in the conceptualisation of their own safety (Ryan, 2005). Heck, Collins, and Peterson (2001) suggest that the injury prevention field has neglected to combine environmental and behavioural interventions. It is by actively engaging in activities that may have a degree of inherent risk that children are given experiences they need to make informed decisions about the environment and their capabilities in risk situations (Malone, 2007). Play, the leading activity for preschool children (Karpov, 2003), is an important stimulus for gaining the experiences children need to learn to manage challenges vital for developing important healthy lifestyles (Mitchell, Cavanagh, & Eager, 2006) that include risk situations. As suggested by Heck et al. (2001), the nature of playground behaviour may be in itself inherently risky. In their study involving 379 children from a public school in the Columbia district, Heck et al. (2001) observed kindergarten to third grade children's behaviour on climbers and slides during a 25-minute lunchtime recess. Two observers independently recorded data without interaction, pre-intervention and follow-up in the same manner. According to Heck et al. (2001), the risk of injury increased when children used equipment incorrectly and risky behaviour decreased following an episode of safety training. This suggests safety education programs can contribute to positive safety-related behaviour change.

There are very few studies that have been able to correlate the effectiveness of safety education programs for children with injury reduction; however, a large cohort study conducted in Bangladesh returned some remarkable results. The Bangladesh Health and Injury Survey 2005 reported that injury was the single largest reason Bangladeshi children aged one to 17 years died (SwimSafe,

2015), accounting for around 30,000 childhood deaths a year, with 17,000 of those deaths from drowning. Every 31 minutes a Bangladeshi child dies from a drowning incident (SwimSafe, 2015). To address these alarming statistics, a program called "SwimSafe" was developed in association with UNICEF, The Alliance for Safe Children (TASC), Royal Life Saving Society – Australia (RLSSA) and the Bangladesh Swimming Federation (BSF). The SwimSafe program was further developed into a broader child injury prevention project called PRECISE (Prevention of Child Injury through Social-Intervention and Education).

PRECISE conducted a rigorous, controlled research project engaging a population of over 800,000 of which 350,000 were children from villages located in three separate, sub-district intervention areas in rural Bangladesh. This large cohort of children allowed for a statistically significant randomised, controlled trial to be conducted on the effectiveness and safety of the SwimSafe program. Children aged four years and older in the intervention group were taught water safety, safe rescue and survival swimming skills. The program was carried out in village ponds, which had been sectioned off by bamboo structures and converted into safe training sites.

Figure 1.3. Children taking swimming lessons in the village pond (photo provided by Royal Life Saving Society, Australia).

Children in the control group did not participate in survival swimming training. Statistically significant reductions in fatal drowning rates were found in children who had participated in the SwimSafe intervention – 93 per cent lower than children in the control group (SwimSafe, 2015).

To demonstrate the critical effect affordable resources can have on reducing childhood deaths, a comparison between measles and injury is discussed.

In the years 1978–84, data collected from the Matlab DSS showed the number of childhood deaths from drowning and measles was equal in the Matlab region in Bangladesh (Linnan et al., 2012). However, with measles being recognised as a leading killer, much time and money was invested in the development of vaccines and the resources to administer them to fight this disease. This resulted in elimination of measles as a significant cause of childhood deaths by the 1980s (Linnan et al., 2012). Over three years between 2006 and 2009, 28,000 children were taught to swim in the SwimSafe program, with no deaths or serious injuries recorded during that period (Swimsafe, 2015).

Given that drowning is now the number one cause of childhood death in Bangladesh, this suggests that if water safety initiatives with proven cost-effective measures for preventing drowning were implemented with the same time and financial resources as measles received, similar outcomes of reduced childhood death could be achieved.

Shearn (2006) considers safety education for young people important for at least two reasons: first, children are most at risk from dangers due to their relative inexperience; and second, potentially health-damaging habits are formed during the early years of growing up and are considered to influence adult behaviour. The timing and method of introducing injury prevention initiatives can impact on the effectiveness of the program. Research tells us that by the end of kindergarten, children should have developed self-regulation capabilities (Bodrova & Leong, 2007). This includes being able to act in a deliberate and informed manner to adjust to their cognitive, physical and emotional behaviours (Bodrova & Leong, 2007). Preschools and kindergartens offer an ideal learning environment and structure to deliver injury prevention programs, where teachers, parents and children can collaboratively work together to construct new safety learning. The opportunities and benefits gained by preschools actively engaging in shared-learning safety education programs is discussed in greater detail in chapters 4 to 9.

There is a limited number of studies on safety education programs that have been implemented in educative settings with preschool children. However, collectively, these studies suggest that intervention programs that are educative have the potential to make a serious difference to childhood injury. As such, the following hypotheses are introduced to determine whether a cultural-historical, shared-learning intervention program supported by parents and teachers is considerably more

effective than conventional ongoing educational programs for developing safety understanding in children, and if the intervention program can enhance children's ability to manage their own safety.

Research Hypotheses

1. Safety education programs designed for preschool children can provide a foundation for children to develop an integrated understanding of safety and how to recognise, analyse and respond to potential injury risk situations.

2. Safety is a skill that through everyday life experiences linked to curriculum resources and programs can be developed to enhance children's ability to manage decisions about their own safety and others.

Research questions. To test the study's assumptions, the following research questions were designed:

a) How do preschool children perceive safety, safe and unsafe situations?

b) Do children gain greater safety awareness, knowledge and skills from the SeeMore Safety program compared with general preschool safety education programs, if any?

c) Is the SeeMore Safety program effective in changing children's safety perceptions and behaviours?

The intervention program called SeeMore Safety is introduced in this study as the primary resource to test the hypotheses and investigate whether safety education programs for preschool children have the potential to develop safety risk intelligence as a form of safety-related capacity building.

The next chapter builds on the review of relevant research and theory introduced in this first chapter in order to think about how children conceptualise safety and risk. Cultural-historical theory is more extensively reviewed because it acts as the guiding principle for the injury prevention intervention where new learning is extended through collaborative processes. This theory also offers an alternative conception of child development to a maturational model by using a different "lens" through which to conceptualise the approach to the study design.

Chapter 2

Theoretical Framework of the Study

Cultural-Historical Theory

Theoretical perspectives that promote learning constructed through interaction with others is thought to be fundamental to gaining understandings of safety. Comprehension of personalised safety risk management skills requires a higher level of internalised conscious thought that cannot be gained by maturation alone. Understanding the way children learn and interact in the environment to manage safety-related risks is explored through a cultural-historical theory that values a focus on the child's social situation of development and an interactive model of learning.

In this chapter it will be argued that a cultural-historical approach to learning is instrumental in shaping a child's sense of safety, extending their ability to manage injury-related risks.

Vygotsky's theories are founded on the belief that human learning transpires as an internalisation of social relationships (Vygotsky, 1987). This means that learning develops predominantly through interactions with family members, teachers, peers and other knowledgeable people (O'Donnell et al., 2012). For Vygotsky, guided participation where the child is being supported by a more knowledgeable person is embedded in the learning process (O'Donnell et al., 2012). Vygotsky (1962) believes that the learner can be extended to reach new levels of understanding through this shared-learning process; he terms this the "zone of proximal development".

Zone of proximal development (ZPD). Within the theoretical concepts offered by Vygotsky (1987), the zone of proximal development is considered important in cognitive development. It provides a way of conceptualising the association between learning and development. Vygotsky (1987) defines the ZPD as the "difference between the child's actual level of development and the level of performance that he achieves in collaboration with the adult" (p. 209). He argues this is the distance between the actual level of development and problem-solving ability achieved independently by the learner and the level of potential development and problem-solving ability achieved by the learner with guidance from, or in collaboration with, a more knowledgeable person (Vygotsky, 1987). A schematic representation of the ZPD process is shown in Figure 2.1.

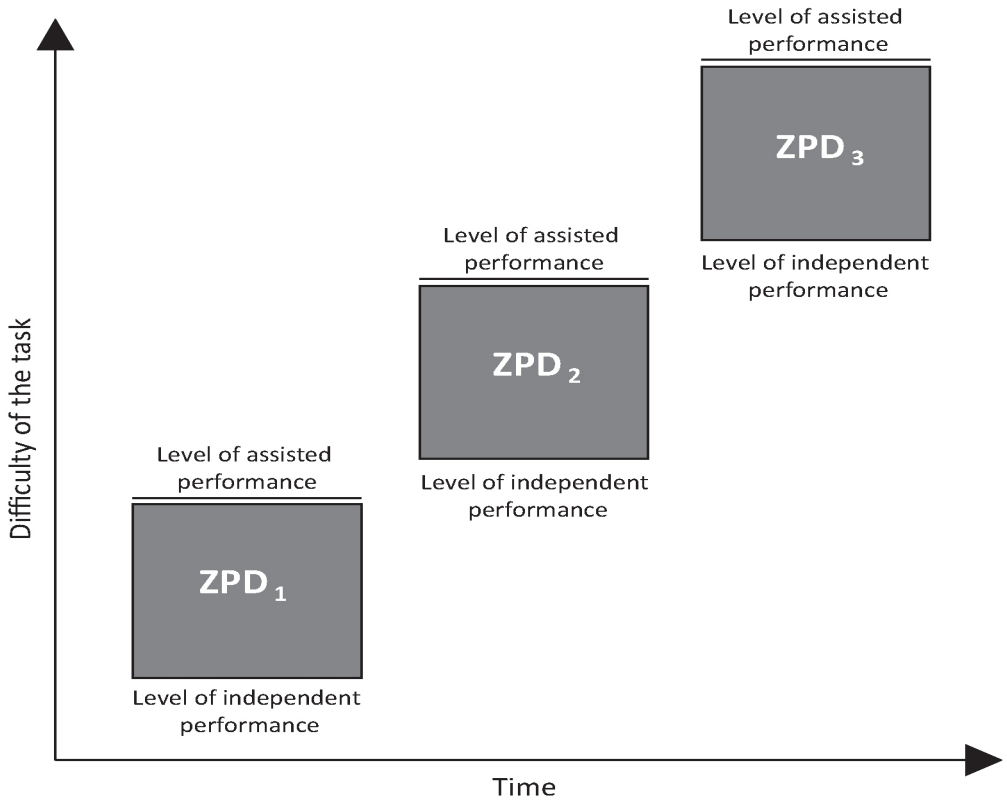


Figure 2.1. The dynamic nature of the ZPD Source: Bodrova & Leong 2007, p. 42.

The ZPD is forever evolving as the learner reaches a higher level of thinking and knowledge and is capable of learning more complex concepts and skills (Bodrova & Leong, 2007). This cycle is repeated as the learner tackles a more difficult task, which may require a new level of assistance. This shows the significance of the interactive and dialectical process of development in new learning. The concepts of "scaffolding" and "co-construction" associated with the socio-cultural model promote learning supported by a more knowledgeable person (Anning et al., 2004, p. 32). The term scaffolding is where the more knowledgeable person provides assistance within the ZPD to enable the child to reach a higher level of performance (Bodrova & Leong, 2007; Wood, Bruner, & Ross, 1976). The task is not changed with scaffolding; however, the level of assistance gradually decreases as the learner takes on greater responsibility (Bodrova & Leong, 2007). In the co-construction process, the learner is engaged collaboratively in culturally meaningful problem-solving activities (Berk & Winsler, 2005). Therefore the child is promoted as a powerful player in the child's own learning, (Anning et al., 2004).

Vygotsky's theories on mediation were extended through the work of his students to include two types. The first is mediation through social interaction with another human being, and the second is symbolic mediation through an organised activity (Kozulin, Gindis, Ageyev, & Miller, 2003). Approaches central to the human mediator would study "what kind of involvement by the adult is effective in enhancing the child's performance" (Kozulin et al., 2003, p. 19). Whereas the symbolic

aspect focuses on "what changes in the child's performance can be brought about by the introduction of symbolic tools-mediators" (Kozulin et al., 2003, p. 19). According to Rogoff (1994), guided participation involves culturally organised activities where the child's learning is supported and enhanced.

Whilst theorists in the socio-cultural train of thought place teachers and learners in their social context as the compelling influence in the learning process and outcomes, there is differing emphasis placed on the learner versus the social context (Bandura, 1997; Lave & Wenger, 1991, 1999). However, within guided participation, it is believed that the child and more knowledgeable person play mutual and complementary roles in the social interaction process (Lave, 1991; Rogoff, 1995). This, according to Chaiklin (2003), is explained in Vygotsky's introduction to the zone of proximal development where "it is not the competence of the more knowledgeable person that is important; rather, it is to understand the meaning of that assistance in relation to a child's learning and development" (p. 43).

Through engaging with others, children learn to use the tools of thinking provided by culture, transforming the cultural tools of thought independently for their own purpose to make meaning and develop conceptual thinking (Rogoff, 2003).

In safety-related learning, the learning usually involves internalising multiple concepts to accomplish the holistic nature of the task. For instance, in introducing a bike to a child there are the mental processes, the physical development and the safety-related learning factors. Because of the risk of injury element within the safety landscape, the learning may require a high level of involvement by the more capable person initially to be effective in enhancing the child's performance. However, as the child becomes more competent, the adult's involvement reduces. As discussed previously, this cycle is repeated over and over again as the learner embarks upon a more advanced task. Using a bike scenario as an example, the child is given a bike and fitted with a helmet; at first, the child is shown how to wear the helmet and has the safety reasons for wearing it explained. With experience, the child is able to put the helmet on independently with the knowledge of protection from injury. The bike may have training wheels and the child is assisted to ride it by the more capable person, who initially may help with the pedalling action. Pedalling is the focus of the learning. Once the child has become competent at pedalling and can ride the bike independently, the child then progresses to the next task of riding without training wheels. In this scenario, the parent may balance the bike until the child becomes more competent to ride unassisted, and so on.

The child's performance is brought about by the introduction of the bike and helmet as the mediating tools. This demonstrates how the learner is extended into what Vygotsky (1962) terms as the zone of proximal development. Through the shared-learning process, the more capable person extends the learner to reach new levels of development with factors of both cycling capabilities and safety understanding going hand in hand to enable the child to become an independent safe cyclist. This learning demonstrates a cultural-historical view of development where it is the child's social competence rather than their biological maturation that is foregrounded in the theory (Fleer, 2010).

The social situation of development. According to Vygotsky (1987), a child's learning is embedded in life-periods determined by relationships between children and their social environment. Vygotsky (1987) calls this relationship "the social situation of development" (p. 32). Vygotsky (1998) argues:

> the social situation of development represents the initial movement for all dynamic stages that occur in development during the given period. It determines wholly and completely the forms and the path along which the child will acquire ever-newer personality characteristics, drawing them from the societal reality as from the basic source of development, the path in which the social becomes the individual. Thus, the first question we must answer in studying the dynamics of any age is to explain the social situation of development (p. 198).

Bozhovich (2009) suggests the social situation of development is one of Vygotsky's most important concepts because it signifies the role of the environment in the child's mental development. Vygotsky uses the term to define:

> the special combination of internal developmental processes and external conditions that are typical of each developmental stage and that condition both the dynamic of mental development for the duration of the corresponding developmental period and the qualitatively distinct psychological formations that emerge toward its end (Bozhovich, 2009, p. 66).

According to Bodrova and Leong (2007), the social situation is the means by which the learner's development moves forward with the provision of new and more advanced mental tools. Bodrova and Leong (2007) argue that as the child's abilities continue to grow, the social context adapts to accommodate the new skills and shape the child's growing competencies. Therefore the child's social situation, whilst dependent on the societal and cultural context of the world in which the child

lives, is forever evolving to provide for the new learning, or the next opportunity to put into practice the new knowledge. According to Fleer (2010), the social situation of development will not only be determined by the community and cultural context, it will also be family specific.

Emotional experience. Through Vygotsky's (1998) studies of the social situation of development, he discovered the significance of the child's emotional experience in relation to the environment, and how it affects the direction of the child's development. According to Vygotsky (1934), it is the emotional experience arising from aspects of the child's environment that determines what influence this situation or this environment has on the child. Therefore the same environmental situation or events can influence a child's development in diverse ways, depending on the child's perception and prior experiences. Vygotsky (1934) advises us to:

> find the relationship which exists between the child and its environment, the child's emotional experience [perezhivanie], in other words how a child becomes aware of, interprets, [and] emotionally relates to a certain event. This is such a prism which determines the role and influence of the environment on the development of, say, the child's character, his psychological development, etc (pp. 338–354).

This implies that to understand fully what effect the environment has on a child's development, the nature of the child's experience must be appreciated. In determining safety risks, the personal characteristics of the child, which influence the child's attitude to the given situation, have been taken into account in the child's emotional experience. Therefore the emotional experience the child has also determines the characteristics which will play a role in influencing the attitude to the given a situation in context of the child's safety.

Vygotsky (1934) argues that the emotional experience is the unity of environmental and personal features that affect psychological development of children. This means the significant role the environment plays in the child's development is influenced by the relationships that exist between the child and the environment. Vygotsky (1934) describes an emotional experience as*:*

> a unit where, on the one hand, in an indivisible state, the environment is represented, i.e. that which is being experienced – an emotional experience (perezhivanie) is always related to something which is found outside the person – and on the other hand, what is represented is how I, myself, am experiencing this, i.e., all the personal characteristics and all the environmental characteristics are represented in an emotional experience (perezhivanie);

> everything selected from the environment and all the factors which are related to our personality and are selected from the personality, all the features of its character, its constitutional elements, which are related to the event in question. So, in an emotional experience (perezhivanie) we are always dealing with an indivisible unity of personal characteristics and situational characteristics, which are represented in the emotional experience (perezhivanie) (pp. 338–354).

This suggests that each situation or event in a child's environment will have a different effect depending on how the child understands their sense and meaning. For example, a child who has experienced crawling down the stairs backwards to reach the bottom will react differently to a child who has fallen down the stairs. The first child perceives the experience as rewarding, the second child views the experience as painful. The same event has a completely different meaning for each child and is reflected in their consciousness in an entirely different manner. This means that a child at different stages of their development imagines and interprets the environment in a different way. As the child understands more, the child begins to make sense of things that they did not understand earlier. What is also important in the developmental process is "point of time". Vygotsky (1987) refers to a "sensitive period" to define a period of development where:

> he found that the organism is particularly sensitive to particular types of influences. At a critical point, the influence may elicit profound changes that have impact on the whole of development. At another point in the developmental process, these same conditions may have no influence on the development or they may even have an effect that is the opposite of what they would have had during the sensitive period (Vygotsky, 1987, p. 212).

Therefore the sensitive period is influenced by what the child brings to a situation at that point of time and the child's relationship to the environment. According to Vygotsky (1934), to understand the influence of the environment in development, attention needs to be given to the context in which the growth patterns of a child's sensory and motor functions, and psychological functions such as personality, consciousness and relationship with reality takes place. To bring this to the fore, Vygotsky (1934) uses the concept of speech to explain the role of environment in child development:

> Child development is achieved under particular conditions of interaction with the environment, where this ideal and final is not only already there in the environment and from

> the very start in contact with the child, but actually interacts and exerts a real influence on the primary form, on the first steps of the child's development (pp. 338–354).

At the beginning, a child is only able to pronounce individual words. However, these individual words then form the child's dialogue with a person who has mastered the ideal form, which the child ought to achieve by the end of his development. This, Vygotsky (1934) argues, signifies the fact that the environment is the source of development and not its setting. A child will develop the concept of managing risk situations safely in these circumstances compared to other children who are given no guidance in an environment where no developed form of safety thinking exists, and whose development therefore will remain extremely limited and very narrow in scope. This suggests that if the child's interaction with the environment is independent of social interaction, and the environment becomes disrupted, the child's only source of development is based in the child's hereditary instincts which limit the capacity of the development of higher human characteristics (Vygotsky, 1934). This foregrounds Vygotsky's (1934) argument that man is a "social creature" and that "without social interaction he can never develop in himself any of the attributes and characteristics which have developed as a result of the historical evolution of all humankind" (pp. 338–354).

It is this principle that illustrates the fact that the child's higher psychological functions and attributes originally appear as forms of the child's collective behaviour, through cooperation and interaction with other people, and afterwards become internalised individual functions of the child, "a child's internal asset, his property and a function of his personality" (Vygotsky, 1934, pp. 338–354).

Age as a Central Criterion for Conceptualising Theories of Development and Learning in Childhood Education and Childhood Injury

Age as a criterion used to classify childhood development reflects society views and emerging institutional practices (Fleer, 2009). As discussed in the first chapter, the prominence of age-related classification of childhood development has dominated Western education. However, Rogoff (2003) believes it has been relatively unquestioned and not representative of all parts of the world. In some parts of the world such as Oceania, New Guinea, Central and West Africa, childhood development is socially determined (Fleer, 2009; Rogoff, 2003). For example, children as young as three are among the Kwara'ae of Oceania's skilled workers in gardens and households (Rogoff, 2003). According to Fleer (2009), who draws upon Nsamenang and Lamb (1998), "Children are

progressively assigned different roles at different life's stages depending on their perceived level of social competence rather than on their biological maturation" (p. 252).

Therefore social competence reflects expectations that can only be understood in circumstances of communities and their traditions because they can be so vastly different. For example, in addition to Oceania children working alongside parents in gardens, they are provided with their own plots. Whilst initially this may have a play-based focus, by the age of three or four, many children are taking produce they have been responsible for growing to sell at markets (Rogoff, 2003). Much of this section draws upon the work of Rogoff (2003) who demonstrates the significance of understanding how culture matters in human development. Rogoff (2003) believes that scholars are now aware of the importance of understanding cultural aspects of human development in educational practices.

Age as a criterion for childhood education. At the time when countries introduced compulsory schooling, starting ages were introduced, which allowed schools to progress children through in age-based groupings (Chudacoff, 1989). In Australia, age-determined practice is common in most care and learning institutions, where children are separated into age-classified rooms in day care centres and classrooms in preschools and schools. The dynamics of the child's personality and the child's development do not form criteria for classroom classification. Rogoff (2003) argues that although schools and curriculum are classified by age where class structure provides for children of the same age, this does not relate to children's development. Blunden's (2008) transcription of Vygotsky's problem of age theory indicates that:

> the age levels represent the integral, dynamic formation, the structure, which denies the role and relative significance of each partial line of development. At each given age period, development occurs in such a way that separate aspects of the child's personality change and as a result of this, there is a reconstruction of the personality as a whole – in development there is just exactly a reverse dependence: the child's personality changes as a whole in its internal structure and the movement of each of its parts is determined by the laws of change of this whole (Vygotsky, 1998, pp. 187–205).

Therefore using the age alone to classify periods of childhood does not allow for the complexities that are associated with childhood development. Vygotsky (1998) believes that dividing childhood into periods means systematic classification of age levels needs to move on "to classification based on the eternal essence of the process of being studied" (p. 198). Whilst age-related classification for

childhood development has dominated education, more recently researchers have been interested in studying how cultural-historical aspects of human development apply in the education fields (Bodrova & Leong, 2007).

Age classification for determining childhood injury. Like the dominance of age-related classification for childhood development in Western education, the field of childhood injury has predominantly drawn upon age as one of the main decisive factors for determining associated risks (Australian Bureau of Statistics (ABS), 2006; Clapperton, Cassell, & Wallace, 2003; NPHP, 2004; Ozanne-Smith & Williams, 1995; WHO, 2008). However, the WHO (2008) suggests that using age ranges in years to analyse injury data can be far too broad to detect the rapid change in development and risk of injury. Vygotsky's (1998) argument for age not being a reliable criterion for establishing a child's developmental level may also apply to the field of childhood injury. The concept of developmental stages and individual differences acknowledges that age in relation to injury is more complex than previously thought (Pointer et al., 2003). According to Pointer, Harrison, and Bradley (2003), age-associated injuries vary because of other factors that impact on age such as physical and mental capabilities and exposure to risk.

It is widely understood that the types of injury common to age groups are reflective of lifestyles, influenced by individuals' experiences, knowledge, circumstances, activities and the opportunities presented to them (NPHP, 2004). However, there are also the multi-faceted external factors such as the physical and socio-economic environments and cultural backgrounds of the individual that significantly impact on safety (NPHP 2004; WHO, 2008;).

Injury risks are unique to every situation. As a child develops, settings other than the home extend wider to encompass environments such as preschools and neighbourhoods (NPHP, 2004). Each setting and experience presents a child with different kinds of hazards and exposure to injury risks particular to that situation. Unless given the right experiences, a child's capacity to understand or to respond to danger is not always matched by their abilities to avoid hazards (WHO, 2008). Each community, workplace, school, home and leisure facility has injury risks determined by circumstances specific to their own environments. An individual's injury risk and perceptions are influenced by their lifestyle and the experiences that come with it.

This is particularly relevant in the realm of safety, as what is considered to be safe to some, others perceive as unsafe. For example, in families from middle-class USA, children are considered incapable of caring for themselves and another child until around the age of 10; in the UK, it is

considered an offence to leave a child unsupervised under 14 years of age. In many other communities around the world, however, children as young as five or seven take responsibility for tending other children (Rogoff, 2003). This is also apparent in children where life circumstances provide different opportunities for skill development. For example, a child who has never ridden a bike before may consider riding a bike a dangerous activity, whereas to a child who is a competent bike rider, the activity is considered quite safe.

Embracing a cultural-historical approach in guiding the safety-learning process accommodates the diversity of individual children and the complexities of their lifestyles. Whilst this chapter draws on a cultural-historical theory, the term "socio-cultural" is referenced. However, this is only in context when the specific writers use the term. The following sections of this chapter will examine the conception of childhood development in the context of children's participation in educational institutions and practices. It will consider and analyse safety-related learning, where age as a central criterion will be shown to have little relevance. It will discuss how age as a criterion has become a "taken for granted classification" in injury prevention literature.

Culture, Learning and Institutional Practices

Managing safety is an ability that requires children to use an informed and advanced form of thinking, attending and remembering process. The nature of safety and injury risk and associated learning means these advanced mental competencies cannot be shaped by the child alone and require the guidance of a more knowledgeable person. Whilst the more capable person is active in guiding the safety-related learning, the child plays an equally important role in that process, with the aim of the child becoming competent and independent in managing their own safety behaviour. This section of the chapter draws upon issues of culture and learning in shaping institutional practices and to better understand the learning progression that underpins safety-related behaviours. Specifically, this section introduces more advanced forms of thinking and concepts relevant to safety learning and conceptualisation, such as psychological tools, and everyday and scientific concepts, whilst respecting culture in learning and considering the child's and the institutional perspectives.

Psychological tools and higher mental functions. Traditionally, predominant learning models have been focused around the acquisition of knowledge and skills; however, over time, it has become understood that this model is lacking theoretically and empirically (Kozulin et al., 2003). Central to the new orientation of the learning theory are psychological tools that, when internalised, extend mental abilities and help children master their own behaviour (Bodrova & Leong, 2007). An

explanation of mental abilities is provided by Bodrova and Leong (2007), describing lower mental functions as being "cognitive processes common to both higher animals and human beings that depend primarily on maturation to develop. Examples are sensations, reactive attention, spontaneous memory, and sensorimotor intelligence" (p. 210). And higher mental functions as "cognitive processes unique to humans and acquired through learning and teaching. They are deliberate, mediated and internalised behaviours built upon lower mental functions. Examples are mediated perception, focused attention, deliberate memory, self-regulation, and other metacognitive processes" (p. 210).

Vygotsky (1934) argued that higher mental functions develop in a particular way: they are built upon lower mental functions; determined by the cultural context; developed from a shared activity between two or more people that becomes internalised later on to an individual function; and involve the internalisation of mental tools. He believed children acquire advanced mental abilities through "tools of the mind" that help them to problem-solve and remember (Vygotsky, 1934). These psychological tools are described as symbolic artefacts such as language, signs, symbols and mediators, with literacy being one of the most powerful of these tools (Bodrova & Leong, 2007; Kozulin et al., 2003). Theorists in the Vygotskian train of thought propose these tools are learned from adults to enhance the child's development and provide the path to independence (Bodrova & Leong, 2007). Psychological tools contribute to the higher mental functions of the child and depend on the presence of mediation in the context of the child's interaction with the environment (Kozulin et al., 2003). Bodrova and Leong (2007) argue that when children have mental tools, their learning becomes a self-directed activity.

Everyday and scientific concepts. Theories of cultural-historical grounding tell us that a child's developmental opportunities are determined by the relationship between the child and their social and material environments, mediated by families and institutional practices. As discussed earlier in the chapter, circumstances of a child's life and activity, and features of their personality need to be included to fully understand the role of experience and its function within cognitive development (Bozhovich, 2009). The insights Vygotsky (1987) offers in relation to experience leads to a significant aspect of childhood development; that of concept formation. For Vygotsky, "a real concept is an image of an objective thing in its complexity" (Egan & Gajdamaschko, 2003, p. 90; Vygotsky, 1997, p. 53). This implies that concept formation is not just superficial images of things such as objects, people and ideas, but making meaning of their purpose. Therefore concepts provide an efficient way for children to organise experience and help them to make meaning of their world.

According to Vygotsky (1987), there are two levels of concept formation: everyday and scientific. "Scientific" in this context does not mean scientific content, but rather it refers to "abstract" or "academic" concepts learned through some form of instruction, schooling or mediation by others. In contrast, everyday concepts are learned from daily life experiences as a result of interaction with the world in which the child lives, but are usually context specific only (Vygotsky, 1987). Whilst everyday concepts and scientific concepts are connected, Vygotsky (1987) suggests that everyday concepts lay the foundations for scientific concepts, and scientific concepts support and strengthen the spontaneity of everyday concepts that, in turn, transform everyday practice. An example of this could be where a child rides a bike at home for fun and physical exercise (everyday concept of bike riding), then at school they are introduced to safety reasoning related to riding a bike (scientific concept of acting safely when riding a bike). For instance, the child may be taught the concept of injury risk posed by the bike in relation to the child's body size. In this scenario, the body–object relationship is introduced into the child's conceptualisation of bike riding and used in a variety of bike riding-related contexts, not just in relation to riding home from school.

Vygotsky (1987) argues that whilst the child has greater experience and knowledge of everyday concepts, scientific concepts engage higher levels of thinking. When children form the concept of injury risk, they are able to avoid it. Conceptual development helps children acquire knowledge they would utilise in furthering their learning and living with minimal injury risk. Vygotsky's (1987) work on concept formation is important to educators in curriculum development and planning, and is therefore central to discovering new pathways to engage children in safety education.

In the sections that follow, the focus changes from Vygotskian concepts for thinking about child development to a cultural-historical conception of curriculum and preschool education. Within this paradigm, a focus on children's learning of concepts is featured in the context of play being the leading activity of preschool-aged children.

Culture and the preschool curriculum. Throughout the thesis, attention has been drawn to the influences contributing to conceptual learning in children where the circumstances of a child's life experiences stimulate development. Every child is born into a situation that has differences shaped by culture, where knowledge, beliefs and practices have been developed within communities overtime. Through communities, knowledge and skills are passed on from one generation to the next. Therefore, when children enter preschool they come with different understandings, experiences and abilities formed by their different cultural backgrounds.

> The issues of culture and learning have been inseparable for centuries for the simple reason that one of the main goals of learning is the transmission of culture from generation to generation. Nevertheless, the majority of educators were oblivious to this cultural element until confronted with it in the reality of the multicultural classroom (Kozulin et al., 2003, p. 15).

In more recent times, the multicultural context of the classroom has led to classrooms becoming responsive to cultural diversity. Kozulin, Gindis, Ageyev, and Miller (2003) believe that it is Vygotsky's ideas that have been instrumental in shaping new understandings of the learning process, and we see this in some classrooms in countries such as Russia (Kravtsov & Kravtsova, 2009), the USA (Bodrova & Leong, 2007), New Zealand (e.g. Te Whariki) and The Netherlands (Davydov, 2008; van Oers, 2009).

The adoption of a cultural-historical framing for curriculum or learning programs in these countries suggests a change in curriculum trends and development for some countries (Fleer, 2011b). This could provide the answer to the challenges of Western education systems in catering for culturally diverse learning institutions. Fleer (2011b) believes it is timely to reflect on the curriculum underpinnings to emulate how children and children's experiences are conceptualised in contemporary everyday life.

Vygotsky's work has provided a strong foundation for developing teaching and learning environments that value the whole child and respect different cultures, lifestyles and elements that come with them, such as languages, prior experiences and learning styles (Mahn, 2003). A cultural-historical view underpinning a framework for early childhood curriculum pays heed to the child's social and physical worlds and values the culturally determined nature of learning that the child brings to these settings. Fleer (2005) argues that:

> the term "cultural-historical development of children" more closely captures the dynamic and complex nature of the interlacing (Vygotsky, 1987) of institutional structures, cultural belief systems and the dynamic processes of children engaged in daily activity with other people (p. 6).

Preschool education is representative of community knowledge and values and therefore should be reflected in curriculum content and learning outcomes based on expectations of the communities, and as societies demand change, the change should be reflected in the preschool education and

curriculum design. According to Fleer (2010), governments and education systems are placing greater demands on academic outcomes for children in preschools, challenging past theoretical underpinnings of childhood development. Old theories of childhood development are no longer relevant to early childhood education in present times (Fleer, 2010). Fleer (2010) suggests that models grounded in cultural-historical theories respond to the challenges early childhood educators face in designing preschool curriculums. Why this is important to this study is because if maturational theories are no longer supported in preschools, the available safety literature, which is heavily based on maturational grounding, is out of step with education.

The relationship between the child's perspective and the institutional perspective. In this section of the chapter, we turn to a discussion of the specific context of preschools and the institutional practices that they afford, but with the view to considering the child's perspective, as is featured in Hedegaard's model. It is argued that preschools with their focus on learning and development provide a suitable context in which safety risk programs can be effectively implemented.

Hedegaard's model of children's learning and development outlines three main perspectives that are useful for conceptualising the place of a safety curriculum for learning:

- The "societal perspectives" that provide conditions for institutional practice through politics and traditions of values
- The "institutional perspectives" with practices found in the home and school
- The "person's perspectives" which reflect the personal motives and values of a person.

Representation of Hedegaard's model of children's learning and development is presented in Figure 2.2.

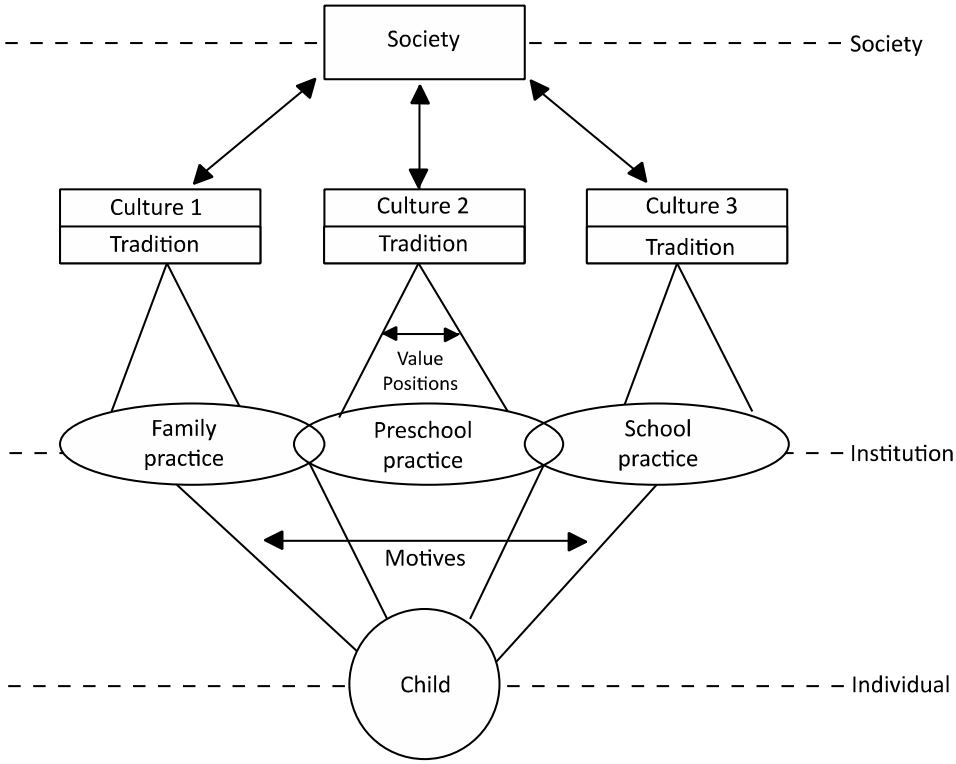


Figure 2.2. Hedegaard's model of children's learning and development.
Source: Fleer, 2010, p. 191.

Specific procedures and values that are considered appropriate in families, institutions and from an individual's perspective are interrelated in Hedegaard's (2005) model to provide a whole-of-life approach to childhood development. Fleer (2010) argues: "a cultural-historical perspective on development that foregrounds the social situation of development within a dialectical framework of the child's perspective, the families perspective and the childcare-schools perspective offers a genuine step forward for early childhood educators" (p. 197).

This means that the child's ability to grow is governed by a collective of influences that provide optimal conditions for development and have the flexibility to change with societal expectations. These expectations are also culturally determined and change to accommodate what is socially accepted at the time. This is important in designing safety education programs so that the curriculum reflects the community's expectations for different life-periods of a child. Expectations of what a child is capable of at a specific period today is different to what was expected for a child of the same age decades or centuries before (Bodrova & Leong, 2007). For example, up to the beginning of the

20th century in the United States, young children formed part of the labour workforce (Rogoff, 2003). Children as young as four years old worked up to 16-hour shifts, performing tasks such as rolling cigars or sorting beads, and five-year-olds worked night shift in cotton mills (Rogoff, 2003). Whereas today, four- and five-year-old children attend preschool or formal schooling, and child labour in the USA is considered unethical, a form of exploitation in manufacturing workplaces considered unsafe.

Bodrova and Leong (2007) argue that it is important that societal expectations match the actual and potential capabilities of the child to allow for optimal development. This matters in safety as overestimation puts a child's safety at risk, whereas underestimation hampers optimal conditions for children to develop competencies they need to become responsible safety risk-takers. Recent trends in childhood injury prevention have seen emerging risk-averse societies, influenced by concerned parents, teachers and regulating bodies for children's safety, which has encouraged an overregulated and overprotective societal change (Gill, 2007; Herrington & Studtmann, 1998; Moore & Wong 1997; Pyle, 2002). Activities and tasks children have engaged in, in the past, are now often regarded as dangerous. As argued earlier, a common response has been to remove children from the activities perceived as dangerous, rather than take an approach that enhances normal development of children's safety capabilities.

As suggested by Wyver, Bundy, et al. (2010), overprotective responses have consequently led to longer-term safety-related risks to children because minor injuries, such as cuts and bruises, are widely recognised as normal for childhood development in injury risk management (Christensen & Mikkelsen, 2008). According to Christensen and Mikkelsen (2008), children who learn from experience of injury are often better at judging their risk of injury than is obvious to adults involved in their care. This does not necessarily mean that children need to incur minor injuries to understand their capabilities, more so that experiences that they are provided with (that may have a low level of injury risk) match the actual and potential of the children.

If children are able to build these competencies during the period aligned with their potential learning abilities, the foundation for achieving more complex safety-related accomplishments that require higher mental functions are not hindered in later developmental periods. According to Bodrova and Leong (2007), whilst higher mental functions do not become apparent until primary school years, preschool children are capable of practising deliberate memory. Safety activities introduced at this level provided a foundation for the next period of a child's development when the

child engages in more autonomous activities, and safety can become more complex. For example, walking to school unsupervised.

Preschool and safety learning. The preschool period is important to safety learning because the developmental accomplishments during this time form the foundation for the child's future development. Preschool for Vygotsky (1896–1934) noted several major accomplishments in development. In brief: first, in the use of language to transform perceptions, attention, memory, imagination and thinking; second, mastery of the child's own behaviour; third, the integration of emotions and cognitions; and finally, the child's social situation of development. It is these concepts that will inform the child's development and understanding of safety. In this context, the development of safety competencies is conceptualised as a whole-of-life process. This important factor in safety-related learning mirrors Vygotsky's approach, where the focus is on the child "to be" (Bodrova & Leong, 2007, p. 42).

The preschool is the first semi-formal education establishment that fosters childhood development, where parents and teachers are able to form partnerships to enhance the children's learning. The nature of the preschool system, which is social in its context, usually has procedures that engage the parents, more so at this level than any in other level of further education. For example, parents or caregivers are required to sign the children in and out of the preschool centres, which provides an opportunity for teachers to be in direct contact with parents and share knowledge with them. In turn, this can further extend the learning, where teachers work together with children as they co-construct meaning and then reinforce messages through family participation. The teacher, supported by the parents, can extend the learner's development to reach new levels of comprehension.

A cultural-historical approach in framing a safety education model means that the curriculum content needs to be culturally responsive to the child's needs and appropriate to the context, where the child's most influential educators – parents and other family members – are included in the model structure. A curriculum where safety-related learning is developed in consultation with families, who actively participate and contribute their knowledge and ideas, is ideal. Therefore the framework for a safety education model should reflect a shared vision based on genuine values, relationships and partnerships that preschools and teachers build with families so that the safety learning and outcomes for their children are relevant in context to their lifestyles.

Fleer (2010) suggests that early childhood education should adopt a practice whereby teachers use a range of cultural tools to collaborate with children and their families to strengthen the social and

cultural influences they already bring to their learning. Hedegaard (1990) argues that although each child is unique, children share common traits such as tradition, neighbourhoods and classrooms where skills and knowledge are developed. It is through these common features that Hedegaard (1990) believes instruction should be developed and therefore reflected in the curriculum content. In this study, it is important to consider the forms of safety thinking that the child brings to preschool, influenced by these common traits such as tradition and neighbourhoods to understand how instruction fits within the safety-learning process.

Vygotsky (1987) argues that "this system of instruction does not lead the child's development forward but rides its tail" (p. 212). According to Vygotsky (1987), instruction and development do not coincide, as they are two different processes that have complex interrelationships. Vygotsky (1987) states: "Instruction is only useful when it moves ahead of development. When it does, it impels or wakens a whole series of functions that are in a stage of maturation lying in the zone of proximal development" (p. 212).

Therefore instruction plays a major role in the development of the child, particularly when directed towards full development of specialised skills such as riding a bike. However, Vygotsky (1987) argues that the instruction will only be productive when it occurs in the zone of proximal development at a certain point.

Conceptualising safety. Fundamental to instruction and teaching is the characteristics of concept formation discussed earlier in the chapter. According to Fleer (2010), research into early childhood teacher knowledge of everyday concepts and scientific concepts in specific subject areas has been limited. However, Fleer (2010) suggests that when teachers in preschools interact with children during play and make them more conscious of the relevant concepts, the children's intellectual lives within the centre can be increased. Figure 2.3 presents a schematic representation of the transformation of everyday practice and the relationship between scientific concepts and everyday concepts in a curriculum model.

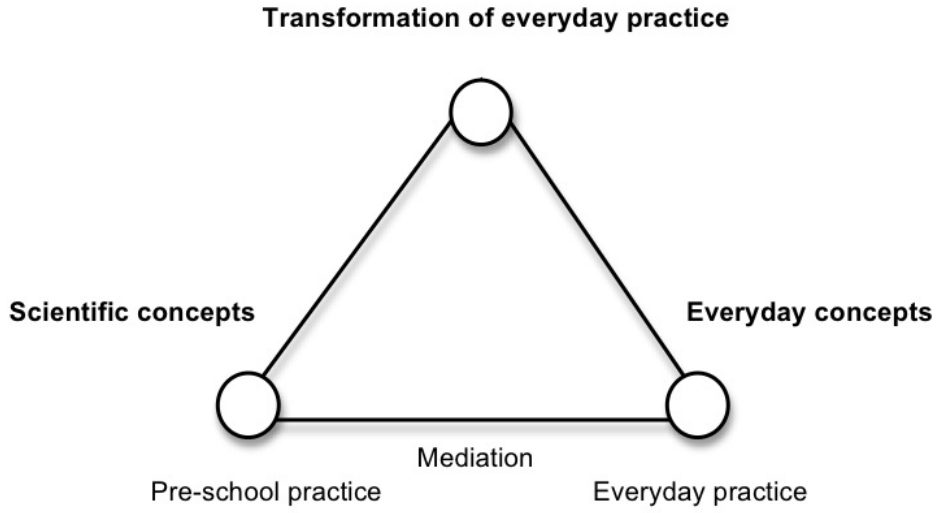


Figure 2.3. A curriculum model to show the relationship between everyday concepts and scientific concepts. Source: Fleer & Raban, 2007; McLachlan, Fleer, & Edwards, 2010.

Mediation of everyday concept and scientific concept formation by educators and parents in the framework of safety could be applied to such a model. Within the context of safety-related learning, the nature of the relationship between everyday concepts and scientific concepts and how they interconnect is significant in the transformation of a child's safety thinking and practice.

In a safety-related curriculum model, a child's safety learning in everyday practice is transformed into safety everyday concepts and scientific concepts. The child acquires knowledge to further develop their safety learning which forms their concept of injury risk. This knowledge is then utilised in everyday practice in order to avoid risk. This model can be used to support children in many safety-related learning practices, transforming them into meaningful everyday activities.

To show how safety is conceptualised in this way, the more specialised activity of bike riding is used as an example. In this instance, a scenario is presented where two children are selecting a bike to ride following a bike safety activity. The first child selects an appropriate-sized bike, whereas the second child selects a bike that is far too big. The first child is able to conceptualise the height of the bike being appropriate to ride and its potential safety implications. There are fundamentally two forms of thinking of the more advanced child: the everyday concept in this particular situation was riding a bike because of the children's prior experiences in bike riding, which in nature were spontaneous and conscious; and the scientific concept that is conceptualised is the help of the

teacher on a previous occasion where the children were exposed to a series of activities based on safe cycling. The first child made independent use of the knowledge gained on the correct height of a bike from earlier collaboration with the teacher. This demonstrates the interrelationship between the everyday concept of riding a bike and the scientific concept of estimation. Vygotsky (1987) explains that in such an instance two different operations are demanded of the child:

> In a problem involving everyday concepts he must do with volition something that he does with ease spontaneously. In a problem involving scientific concepts he must be able to collaborate with the teacher something he has never done spontaneously (p. 216).

One child appears to have a full conceptual understanding of the scientific concept whereas the other child does not consciously consider the scientific but only the everyday concept. The difference in the performance levels of the children's concept formation has occurred because of the collaboration with the teacher. To understand more fully how concept formation of injury risks relates to children's everyday practices, further research is needed if the potential towards the realisation of its purpose in early childhood education is to be achieved.

Leading activity of preschool children. Important in Hedegaard's model is how play as an institutionally supported practice in preschools is linked with the concept of play being a leading activity for preschool children's development. It is noted by many post-Vygotskian researchers (Elkonin, 1972; Kozulin, 1990; Leontiev, 1964, 1978) that leading activity relates to the activity for a given period that guides the child's development. The leading activity is characterised by the child's mediation within this activity that produces developmental competencies, which provide the basis for the child's transition to the next period (Bodrova & Leong, 2003). Therefore the leading activity is progressive, characterised by the child's life-period and the child's development within that period. Like Vygotsky's (1998) activities within the social situation of development, Leontiev (1964, 1978) and Elkonin (1972) believed the leading activity as being culturally constructed, determined by societal expectations for children in certain life-periods.

Vygotsky's (1976, 1998) concept of leading activity was supported by Leontiev (1964, 1978) and Elkonin (1972) who claimed that make-believe play is the leading activity of preschool children. However, whilst play is predominantly the main component of a preschool child's everyday life, Venger (1986) argues there is a place for instruction. He demonstrated that preschool children provided with proper instruction could master skills like music and art, which he states were traditionally reserved for "gifted" children (Venger, 1986). How instruction works alongside make-

believe play challenges our thinking in the way preschool children learn. This has potential implications for preschool structure and how safety education can be received in preschool years.

Vygotsky (1976) and his followers – Leontiev (1964, 1978), Elkonin (1972) and Zaporozhets (1997) – suggest that by preschool, children develop a sense of the adult world and are attracted to become part of it. This, they believe, is achieved by imitating and exploring social relationships through socio-dramatic play (Karpov, 2003). According to Elkonin (1972), the purpose of socio-dramatic play is "to act like an adult" (p. 150). Post Vygotskian's (Elkonin 1972; Leontiev, 1964, 1978; Zaporozhets, 1997) claim that adults should mediate children's play, enabling them to present and explain to the children the different social roles. This is especially important because play being the leading activity during this preschool period is therefore critical to the children's development (Karpov, 2003). However, it is as equally important that the adult's role in this situation is not overemphasised, as such an emphasis can be counterproductive by serving to underestimate the child's competencies.

Adult interaction during play provides the opportunity to present relevant safety concepts and rules that sometimes govern them. Karpov (2003) argues that socio-dramatic play is not free, as it is governed by play rules that participating children create in accordance with their role within the play. These principles align with safety, where rules can form guidance for safe practices similar to those incorporated by children in their imaginative play activities. The relationship between imagination and reality in children's play is discussed in the works of Fleer (2011a) where she argues that conceptual play provides a foundation for a theoretical framework that can support preschool teachers in uniting imagination and cognition in their programs. According to Fleer (2011a): "Through the unity of imagination and cognition, the bridge between play as the leading activity is extended to learning as the leading activity for the child" (p. 234).

Fleer (2010) considers the concept of imagination as an important component in connecting play and cognition. She argues that it is through imagination that children are able to consider their actions and form concepts, where self-development is possible.

Karpov (2003) suggests that post-Vygotskian followers believe by the end of preschool there are multiple outcomes resulting from the children's involvement in socio-dramatic play experienced in the preschool as the leading activity. They include: that learning motivation develops as the leading motivation; that children have developed the ability to self-regulate their behaviour; that children have overcome their egocentrism and consider the position of another child in the course of play,

which in turn changes their position towards the external world; and that children have developed the ability to substitute an object for another object leading to the development of symbolic thought (Karpov, 2003). It is argued that these characteristics and capabilities form the foundation for the child's development in the next period and success in school (Elkonin, 1978; Leontiev, 1964). According to Fleer (2010), educational programs need to develop imaginative thinking as reflected in the unity of play and cognitive development. When preschool learning is theorised in this way, it can be argued that play-based programs may provide a way forward for injury prevention education.

A Cultural-Historical Conception of Safety Learning at the Onset of Early Childhood Education

Safety is a social responsibility and one of the basic necessities for human survival. The early childhood period is the best moment to begin learning about the subject as it provides settings that are ideal for making conscious concepts of safety. "Learning to live and living to learn" go hand in hand. With injury the largest single cause of childhood death and disability worldwide (WHO, 2008), it is timely to explore the critical time in human development that shapes interdependent, responsible, safe risk-taking. This section argues why safety needs to be introduced at the onset of early childhood education. Vygotsky (1987) believes optimal periods for instruction are associated with the social processes that are apparent in the child's development of higher mental functions. Whilst this section often refers to *The Collected Works of Vygotsky*, volumes one (1987) and five (1998), the significance of cultural-historical theory in this study is grounded in the argument for introduction at the preschool level.

Children are experiencing risk situations in the everyday reality of their world. It is how adults mediate these situations that collectively leads to safety consciousness in the context of everyday learning. Particular periods in the trajectory of a child's life, where the leading activities of the child are foregrounded (e.g. play), sensitise them to particular types of influences (as noted by Vygotsky, 1987, Volume 1) that should be known to teachers. Teachers can use this knowledge of child development to inform pedagogy – for example, using play to learn about safety. Vygotsky (1987) identifies school years being an optimal period for instruction. He adds that instruction does not begin at school, but occurs at all levels of a child's development. Vygotsky (1987) argues that instruction significantly influences the course of development in the school years because higher mental functions have not yet developed at the beginning of the formal education period, and because instruction regulates a child's further development. In Vygotsky's (1998) discussions on the optimum times in the child's development for teaching, he argues that:

> teaching is based not so much on already mature functions and properties of the child as on maturating functions. The period of maturation corresponding to the functions is the most favorable or optimum period for the corresponding type of teaching. It is also understandable, if we take this circumstance into account, that the child develops through the very process of learning and does not conclude the cycle of development. First the teacher teaches the pupil not what the child can already do independently, but what he still cannot do alone, but can do with the help of teaching and guidance. The process of teaching itself is always done in the form of the child's cooperation with adults and represents a partial case of the interaction of the ideal and the present form, of which we spoke above, as one of the most general laws of social development of the child (p. 204).

Therefore Vygotsky is suggesting that the optimum period for instruction is actually during the process of learning. This is occurs at a time when the child cannot do alone what they can do in collaboration with an adult. The following chapter considers learning attributes for preschool children, with a strong emphasis on play-based learning as a stimulus for safety learning and development.

The concept of safety embraced within curriculum content in early childhood education has been explored in this chapter. Understanding what content should be included in early childhood curriculum is widely contested; however, there is an argument for the inclusion of safety-related learning within the health and wellbeing landscape of early childhood education.

Safety intervention inclusion within the preschool curriculum should be encouraged for multiple and significant reasons: the first is that early childhood education contributes to lifelong learning (Victorian Curriculum and Assessment Authority, 2008), and safety conceptualisation is a whole-of-life process; the second is that in the first five years of life children acquire more capacities than in the remaining years of existence (Zuckerman, 2003); the third is that the preschool is the foundation institution and vehicle for childhood development; and the final reason is that the system of early childhood education encourages parents and teachers to form partnerships to enhance children's learning, a method that is considered most effective (Victorian Curriculum and Assessment Authority, 2008).

Conclusion

The review of relevant research and theory discussed in this and the previous chapter has brought to the fore a new way of thinking about how children develop safety and risk understanding. A cultural-historical understanding of how children acquire knowledge and understanding is more thoroughly explored to provide an alternative to child development concepts underpinned by maturational theory. The limitations of maturational- and biological- based views of development have been shown not to consider the child's social and material worlds, which are important elements of safety conceptualisation.

A cultural-historical construction of child development provides a richer conceptualisation for facilitating a broader and more holistic understanding of safety and risk. The significance of the social and cultural contexts in which children are learning and living their lives is of great importance in this study given that it investigates variables such as prevailing attitudes to risk and safety, and local issues such as environments and their influences. These are clearly locally, socially and culturally determined activities and attitudes. Cultural-historical guiding principles in early childhood education complement strategies for injury prevention delivery where new learning is extended through collaborative processes.

Preschool settings are supportive environments for building these collaborative processes and social connections with families. A safety risk intellect model incorporated into the existing curriculum provides a strategy to foster the development of safety-related habits during the early years of growing up. These habits are considered to influence adult behaviour in later life.

Play-based learning is a stimulus for safety learning and development and is the leading learning activity for preschool years, as well as for literacy, numeracy and physical activity that foreground curriculums. These pre-academic activities are not the main focus of safety learning; however, they are important elements of safety conceptualisation together with communication and language, and social and emotional development.

Cultural-historical program orientation caters for the complexities frequently associated with children's lives and the injury risks associated with them. Application of cultural-historical principles to the construction of curriculums designed to foster safety-related learning and development in preschool children is further explored in the following chapters. Applying a broader philosophical framework beyond a maturational and biological perspective could potentially

produce a comprehensive appreciation of how children acquire knowledge and understanding in relation to managing safety-related risks. This study draws on cultural-historical theories of childhood development in forming a conceptual framework for developing *safety risk intelligence* in children, where the intervention program, SeeMore Safety, is used as a resource for safety-related capacity building.

Chapter 3

Study Overview

Introduction

In this chapter an overview of the study is provided. Subsequent papers (published and under review) give further details of the specific methods used in the context of a methodological discussion. The study consisted of two components: a preliminary study – named the pilot study – and the main study. The purpose of both studies was to test the two hypotheses stated in Chapter 1, which were:

1. Safety education programs designed for preschool children can provide a foundation for children to develop an integrated understanding of safety and how to recognise, analyse and respond to potential injury risk situations.
2. Safety is a skill that through everyday life experiences linked to curriculum resources and programs can be developed to enhance children's ability to manage decisions about their own safety and others.

To test these assumptions, the following research questions were designed:

a. How do preschool children perceive safety, safe and unsafe situations?

b. Do children gain greater safety awareness, knowledge and skills from the "SeeMore Safety" program compared with general preschool safety education programs, if any?

c. Is the SeeMore Safety program effective in changing children's safety perceptions and behaviours?

Unlike the main study, the pilot study did not address the third research question because the there was not a comparison group involved in the preliminary trials. The pilot study also had additional aims which were to identify any limitations of the intervention program used in the trials, and to determine whether the intervention program content was suitable for preschool children (face validity). This was necessary due to the fact that the author developed the intervention program. The purpose of using the intervention program was not to promote it as such, but to test the effectiveness

of a broad, subject-based safety education program designed for a preschool curriculum which could not be found from other sources.

The intervention program. SeeMore Safety is a shared-learning intervention program designed for preschools, kindergartens and day care centres. The aim of the program is to provide a foundation for the child's conceptualisation of injury risks and safety, whereby the child interacts with teachers and parents to co-construct new safety learning and understanding. The program is culturally and historically grounded and builds on the child's social and material worlds to inform the child's development in ways where the child is recognised as an active participant having agency in the learning process. The SeeMore Safety content is informed by relevant Australian child safety issues discussed in Chapter 1. The design and content of the cards reflect key safety risks associated with young children, and are centred around roads, water and playgrounds in a style that is appropriate for children in the target age group.

The program features a series of themed picture books that are personalised for each child by having their photograph placed in the book to enable them to become a main character in the stories. Children interact with the SeeMore Safety mascot doll to learn about safe practices and injury risks through literature, interactive activities and games, and then use these learnings when they experience real-life scenarios under the guidance and support of adults. The program reinforces the importance of a shared-learning approach, where teachers and parents play complementary roles in the new learning process. The program, which is initially delivered in the preschool, is then taken into the home and shared with parents and other family members. SeeMore Safety includes books, activities, games and ideas for promoting safety. The types of messages conveyed in the resources include safe places to play, being aware of cars reversing in driveways, putting seatbelts on in cars, wearing helmets on bikes, sun protection and ideas on how to be a good friend, etc.

Figure 3.1. Child with the SeeMore mascot doll.

The intervention program is further referenced in chapters 4 to 6. The degree of detail included on the intervention in each paper was centred around requirements from the journal reviewers and limited due to word count.

Resources include:

- 1 x hard copy of the teachers' guide – includes lesson plans and activity pages for each book.
- 4 x spot-the-hazard posters relating to the storybooks
- 1 x SeeMore Safety mascot doll
- 1 x set of testing cards
- 4 x A4 class storybooks
- 100 x A5 student story booklets
- Take-home activities for each child
- 4 x teacher–parent bulletins covering seasonal safety topics
- A safety sign to display in the preschool

Figure 3.2. Examples of the spot-the-hazard posters and class storybooks.

Figure 3.3. Samples of bulletin pages, activity sheets and information posters. (The bulletins are sent out each term.)

The Pilot Study

To limit any potential bias, the pilot study was undertaken by the City of Greater Geelong through its "SafeStart" program in consultation with, but independently of the researcher. The pilot study was also expected to verify the reliability of testing instruments developed and to inform the sample size for the main study. As no suitable existing validated instruments could be found for the purpose of this program, one obtainable instrument was adapted and an additional new instrument was developed.

The preliminary study design employed in the pilot informed the controlled trial with minimal changes to the testing instruments. Three of the cards used for the testing procedure confused the majority of children resulting in an incorrect answer although their justification for their answer made sense and was correct. For example, one of the cards depicting a beach scene had SeeMore, the mascot doll, supplying sunscreen to the hand of a child. The children in one group believed this was an unsafe picture because they were concerned that the drip of sunscreen exuding from the bottle could spill, causing someone to slip. Although the main focus of the card was overshadowed by another potential hazard, the children provided a good explanation for their logic. Given this response from the children, the drip was removed from the picture to increase the probability of reliability. For a similar reason, minor changes were made to another two cards. An image depicting a child crossing the road assisted by a crossing attendant included a stop sign angled in a way that some children understood it to mean that pedestrians were required to stop. The angle of the sign was altered and, subsequently, the probability of reliability of the children selecting the card as safe was increased. The third card that was changed depicted a child swimming between the flags wearing a sun protection top. Some children considered this card as unsafe because they understood the child in the picture to be wearing clothes that would become heavy whilst swimming, which would then make the child sink. The image was altered to redesign the sun protection garment, which resulted in a more reliable response.

Due to the considerable size of the Australian continent, and the number of preschool-aged children across the country, the study demographic was confined to an area in the state of Victoria with a radius of approximately 150 kilometres. Geelong was chosen because it had a similar demographic to the area of Ballarat selected for the main study and fell within the 150-kilometre radius.

The pilot study was conducted over a 20-week period in seven preschools located within the Geelong municipality in Victoria. The preschools represented a geographically diverse group and a

cross-section of socio-economic communities from the Geelong region. The pilot study involved 198 children, 147 parents and seven teachers from the mixture of local government and independent preschools. The children participating were aged between four and six years and the number of children in each preschool group ranged between nine and 58. Children were engaged in pre- and post-testing procedures and took part in focus group discussions to generate data about changes in their safety understanding as a result of participating in the safety education program. Parents completed pre- and post-intervention questionnaires and participated in focus groups discussions to provide more detailed information on the safety knowledge and risk-taking behaviours of their children outside the preschool setting. Teacher interviews generated information about observed changes in children's safety conceptualisation and their views on the effectiveness of the intervention materials and testing instruments.

The findings from the pilot study, which was conducted independently from the researcher, concluded that the program content and design was appropriate and effective for preschool children. The pilot study confirmed the reliability of both the child SRI testing instrument and parent SKSB checklist. However, this study had its limitations because without a comparison group, the underpinnings of the learning could not be determined. The pilot study was unable to determine whether increased safety understanding was due to a maturation developmental process or as argued from a more cultural-historical perspective. It was therefore decided to engage a comparison group to determine the foregrounding of the safety-related learning.

A detailed account of the pilot study can be found in Chapter 4.

The Main Study

Informed by the pilot study, the main study engaged children, parents and teachers from eight preschools from within the Ballarat region. The Ballarat region represents a similar geographically and economically diverse group as that from the Geelong municipality. The preschools were selected via a stratified-random cluster sampling process within a 100-kilometre radius of the city of Ballarat. The sample included 302 children aged between three and six years who were involved in both the pre- and post-intervention tests, as well as 91 parents and eight teachers. The purpose of engaging three sources was to strengthen the validity and reliability of the study findings. The group size in each preschool varied between 23 and 52. The eight preschools included four intervention preschools that trialled the SeeMore Safety program and four comparison preschools that did not receive the intervention program and delivered their usual curriculum. However, the comparison

preschools may have included conventional child safety education programs in their curriculums. Paper two (Chapter 5) presents the findings and full account of the main study.

Study design. The study adopted a cluster sampling quasi-experimental design and combined quantitative and qualitative approaches (Gay, Mills, & Airasian, 2009) involving pre- and post-intervention methods. Qualitative and quantitative data were collected from three sources: children, parents and teachers.

Based on a cycle of data, research, intervention, evaluation and review of the childhood injury problem, a mixed method approach, where educational theory and other disciplinary approaches intersect, was employed. For many research studies, quantitative results are not sufficient without being supported by qualitative data. Therefore by combining quantitative and qualitative approaches, safety can be understood more fully than is possible by using one paradigm alone (Gay, Mills, & Airasian, 2009). The positivist approach provided the opportunity to test the reliability of the measuring instruments used in collecting the data that was needed for the study. Conducting a study based on using this paradigm also enabled the coverage of a large number of participants. Including a qualitative approach provided the opportunity to better understand the underlying reasons, opinions, motivations and insights into a child's conceptualisation of safety.

The sample.

Children

Children were engaged in pre- and post-intervention tests, focus group discussions and interviews. Information was generated through these methods about how children perceived safe and unsafe situations, and to gauge any changes in their knowledge and attitude towards safety and related behaviour as a result of either participating or not participating in the safety education program.

Parents

Through pre- and post-intervention questionnaires and focus group discussions, parents provided information on their child's safety knowledge and behaviours outside the preschool setting and within their home.

Teachers

Teachers participated in interviews either in person or via phone and provided information about changes they observed in children's safety knowledge, attitudes and behaviours at the preschools.

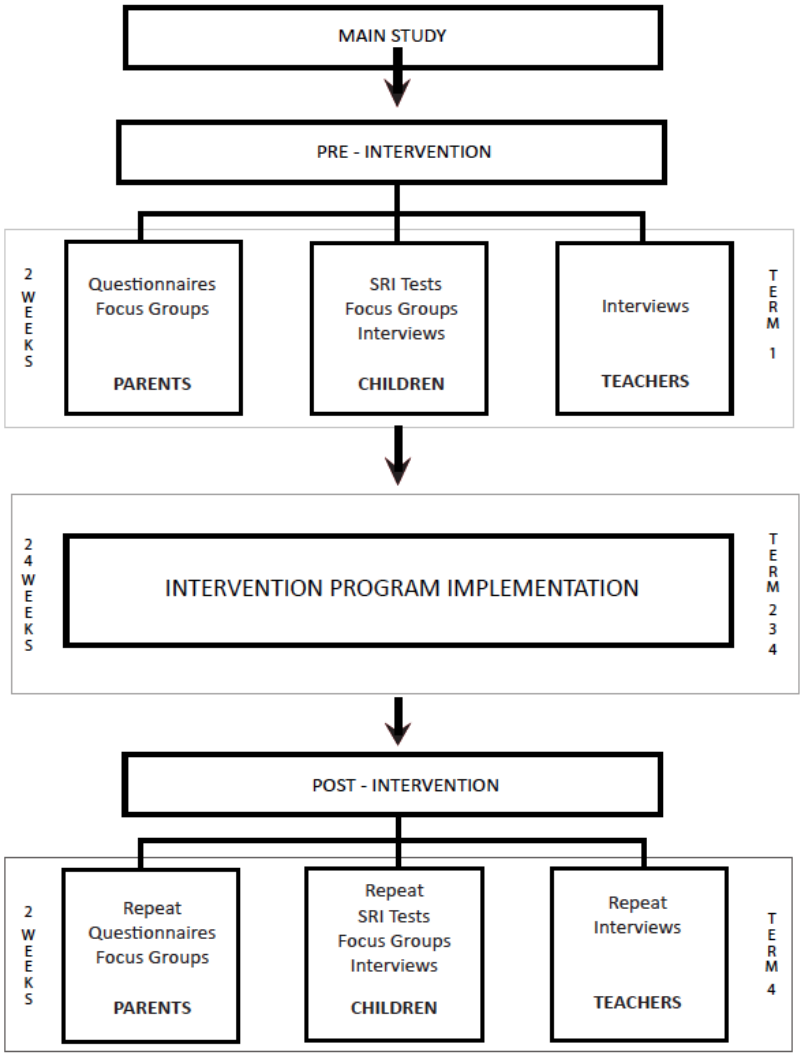


Figure 3.4. Progression of research stages and participants.

Ethics. The ethical principles incorporated into the design of the study received approval from the Monash University Human Research Ethics Committee (MUHREC). The ethical application process that was applied in this study was designed to ensure that children's rights were supported and the study was sensitive to their individual needs. Participation in the research study was voluntary. A child or parent was not disadvantaged in any way if they did not participate. Consent to participate was sought for all children before the the study commenced. Children whose parents chose not to

sign informed consent forms participated in the safety education program as a general class activity, but were not involved in the research component.

To protect child, parent and teacher privacy and confidentiality, pseudonyms were used together with a coding system for preschools. To assist the researcher in recording transcripts, an independent scriber was engaged to record the data.

Testing instruments.

Safety Risk Intelligence Test

A new instrument named the Safety Risk Intelligence (SRI) Test was developed for the purpose of this study (refer Appendix 10.6). The SRI Test is designed to gauge a child's ability to recognise safe and unsafe situations. It includes 20 picture cards depicting 10 safe and 10 unsafe images. Each child is given their own set of test cards. The first action is for the researcher to place two cards on the table in front of the child; one is a card with a happy SeeMore (the mascot) face and the word "safe" underneath, the other is a card with an unhappy SeeMore face and the word "unsafe" underneath.

The researcher then hands the child an additional 20 cards face down. The child is then asked to turn the cards over and directed to place each card on one of the two piles – one with the unsafe images, the other with the safe images – according to whether they think it is a safe or unsafe picture. The cards are given to the child in a random order to avoid bias due to attention span. A mark out of 20 is given for the correct placement of cards and out of five for the response time taken to complete the task. In both applications, Cronbach's alpha test of internal reliability was carried out through repeated measures, which produced similar results confirming their reliability. The response time is based on a five-point scale, ranging from one point for six minutes and over, and five points for two minutes or less (refer Appendix 10.6).

The children are unaware they are being timed, although the response time is considered significant when reacting to a potential injury-risk situation. To enable the researcher to record accurately the children's responses and times, the process was aided by an assistant. The testing process was carried out in groups of four children, with each child in the group randomly selected by the teacher. The purpose of having children divided into small groups was to enable the testing process of all children to be managed within normal preschool time frames and to more easily engage children in the guided focus group discussions that followed the testing.

Following consultation with a statistician and based on the pilot study results, it was determined that with a sample size of 300 children, the SRI Test would provide an 80% chance of picking up a difference of 2 out of 20 (scoring one point for each correct placement of cards) when testing for statistical significance at the 0.05 level. The sample sizes in both the main and pilot studies were found to correspond with reliability and validity factors prepared initially in consultation with the statistician.

Safety Knowledge, Skills and Behaviour Checklist

Drawing on the work of Polgar and Thomas (2008) and Greig, Taylor, and MacKay (2007), a questionnaire was designed to enable parents to provide both factual data and opinions on their child's safety understanding. This second instrument, named the Safety Knowledge, Skills and Behaviour (SKSB) Checklist (refer Appendix 10.5), has been adapted from a current instrument known as the Injury Behaviour Checklist (IBC). The IBC is considered a useful research tool and is used in numerous research studies as a screening procedure for identifying children at risk of injury (Speltz, Gonzales, Sulzbacher, & Quan, 1990). Although 13 questions in the SKSB checklist are similar in nature to questions in the IBC, they have been reworded to correspond with the content of the SeeMore Safety program. For example, question 1 on the IBC states "runs onto the street", question 1 on the SKSB checklist states "runs or steps onto the road without looking".

The SKSB is a checklist of 24 items, which relates to the safety knowledge, skills and behaviour patterns of preschool children, commonly aged between four and six years, and is designed for parents. The questions relate to subject matter explored in the SeeMore Safety program that have been developed from relevant Australian child safety issues. In this study, the parents of the intervention group children were required to record their child's level of engagement in each of the 24 behaviours pre- and post-intervention on a five-point scale. Correspondingly, the parents of the comparison group children were required to record their child's level of engagement in each of the 24 behaviours during the same time frame as the intervention group and on the same five-point scale. The scale points ranged from "0 = never", to "5 = almost always", with a space for parents to add additional comments. A Cronbach's alpha test was applied to the testing instrument through repeated measures, which produced the total reliability of the scale at 0.84, confirming it to be highly reliable.

Statistical analysis. Data collected through quantitative methods was entered into Excel spreadsheets, arranged by preschool. Using the SPSS 17 software (SPSS, 2008), a mixed-model

factorial ANOVA analysis was conducted on the results of the child SRI Test and the parent SKSB Checklist pre- and post-intervention.

Methods.

Focus groups

The work of Krueger and Casey (2000) and Polgar and Thomas (2008) was used to develop the structure and design of the process for conducting the focus group discussions with parents and children in this study. Data collected from the focus groups assisted in uncovering factors that may have influenced safety-related behaviour and explained the quantitative data that was collected from the SKSB Checklists and SRI Tests. During the pre- and post-intervention information sessions, parents from both the intervention and comparison groups were invited to participate in focus group discussions that were to be held later. The reason invitations were issued at the information sessions was to gain a higher level of participation and therefore feedback from the parents in the focus group discussions. The discussions and responses from these focus groups were initially taped with notes also taken by the research assistant. Transcripts of all the focus group discussions were subsequently produced.

The focus groups held with the children were designed to obtain information regarding children's understanding about safety and risk with changes noted, if any, between pre- and post-intervention testing and discussions. The discussions were recorded via video camera and written notes taken to record accurate contributions from the participants.

Interviews

Interviews were also used as another method by which to obtain children's perspectives on safety and risk and the changes in their knowledge and attitudes towards safety. This study draws on strategies for conducting effective interviews as well as the interview models discussed by Polgar and Thomas (2008). A total of 32 children participated in the interview process, representing approximately 10% of the sample size. The interviews were conducted pre- and post-intervention.

All teachers participating in the study were involved in pre- and post-intervention interviews so as the study could gain an understanding of children's safety perceptions, knowledge, attitudes and behaviours, and changes, if any, that the teachers observed at the preschools. The comparison group teachers were involved in the same process and time frame as the teachers from the intervention

group. Open-ended questions (Krueger, 2007a; Polgar & Thomas, 2008) were asked in the teacher interviews and written notes were taken of the responses and information provided.

As the tests, questionnaires, interviews and focus group discussions for the pre-intervention period were carried out in the eight preschools during first term in 2009 and the post-intervention work was undertaken during fourth term in 2009, the seven-month intervention period occurred between the second and fourth terms in 2009.

Whilst the Seemore Safety program is designed as a year-long course, it has the flexibility to cater for individual preschool needs and can be condensed into shorter time frames, as was the case in this study. The approach and results of pre- and post-quantitative data are further discussed in chapters 4 to 6.

Procedure. All local government and independent preschools within a 100-kilometre radius of the city of Ballarat were numbered. Corresponding numbers were placed into a container and drawn randomly. The first four selected were chosen to receive the intervention and the remaining four selected for the comparison group. The directors from the eight preschools were then contacted via telephone to ascertain their interest in their preschool participating in the trial. Seven of the eight accepted and one intervention preschool declined due to the director taking maternity leave during the trial period. The stratified-random process was then repeated to select the fourth intervention preschool. Once acceptance was received from the eight preschools, all of them were sent a formal letter of invitation (refer Appendix 10.2) and a meeting was arranged with each preschool director.

The purpose of the meetings was to inform the director and teachers about the study, intervention content and procedure for conducting the trial. Whilst the comparison group preschools did not participate in the intervention process, they were offered the resources on completion of the trial providing the intervention materials were found to be effective. The teachers from both intervention and comparison preschools then arranged parent information sessions and distributed parent letters (refer Appendix 10.3), explanatory statements (refer Appendix 10.1) and consent forms (refer Appendix 10.4). The forms were returned via the teachers to protect the privacy of the participants.

At the information sessions parents were introduced to the SeeMore Safety program, received an explanation of the study's rationale and completed the SKSB Checklist. On completion of the checklist, both intervention and comparison group parents engaged in focus group discussions on safety understanding within their families. A training session followed for intervention parents on

reinforcing the program at home. The parents that were unable to attend the information sessions were offered personal meeting times.

In the following weeks prior to the commencement of the intervention program, the researcher and an assistant visited each of the eight preschools and conducted the pre-testing procedure. The children were randomly selected into groups of four by the teacher. Each child was provided with their own set of SRI testing cards. Administered by the researcher and assistant, the children completed the SRI Test and engaged in focus group discussions. Four children from each preschool were selected by the teacher to take home a disposable camera to record situations and items they perceived to be safe and unsafe in and around their home. At subsequent preschool visits, one-on-one interviews were conducted with the children given cameras and the photographs taken by the children were used in focus group discussions post-intervention. The intervention materials were then distributed to the intervention group preschools free of charge.

The four intervention preschools commenced the SeeMore Safety program at the beginning of term two and finished it in term four (refer Figure 3.4). The four comparison preschools continued with their usual program.

At the completion of the SeeMore Safety program in term four, parents were invited back to participate in a post-intervention focus group session. During the session, parents were asked to complete the SKSB Checklist containing the same information as the checklists completed pre-intervention. The focus of the group discussion during this session centred around any changes the parents had witnessed in their child's safety knowledge, skills and behaviour, and the effectiveness of the program.

The children were once again invited by the teacher to form focus groups of four and participate in the post-intervention SRI Test, which was considered by most children as a game. This activity also included sharing the photographs taken by the children selected at the commencement of the program. The small focus group forum provided an ideal opportunity for the researcher and assistant to collect qualitative data via transcript. The children generated in-depth discussions about safety, prompted by the animated cards and the children's photographs of real-life situations that in many cases corresponded with the cards.

Informal interviews were conducted by the researcher with all teachers at the end of term four following the testing procedures. Information generated from the teachers' perceptions of the

children's safety knowledge, skills and behaviours, and any noted changes, together with the experience of participating in the study, were recorded by the scriber.

Chapter 4

A Cultural-Historical Construction of Safety Education Programs for Preschool Children: Findings from SeeMore Safety, the Pilot Study

Declaration for Thesis Chapter 4

Declaration by candidate

In the case of Chapter 4, the nature and extent of my contribution to the work was the following:

Nature of contribution	Extent of contribution (%)
Susie (Sueanne) O'Neill	90%

The following co-authors contributed to the work. If co-authors are students at Monash University, the extent of their contribution in percentage terms must be stated:

Name	Nature of contribution	Extent of contribution (%) for student co-authors only
Professor Marilyn Fleer	Reviewed paper	
Dr Joseph Agbenyega	Reviewed paper	
Professor Joan Ozanne-Smith	Reviewed paper	
Megan Urlichs	Reviewed paper	

The undersigned hereby certify that the above declaration correctly reflects the nature and extent of the candidate's and co-authors' contributions to this work*.

Candidate's Signature	[redacted]	Date 18/04/2015

Main Supervisor's Signature	[redacted]	Date 18/04/2015

Preface – Linkage of Papers One and Two (Chapters 4 and 5)

The findings of the pilot study (Paper One – Chapter 4) and main study (Paper Two – Chapter 5) follow. Papers one and two investigate the underpinnings of safety learning, and whether shared-learning approaches in early childhood educational settings have an important role to play in shaping a child's sense of safety. However, each study had a secondary purpose and point of difference, which is elaborated below.

Paper One: *A Cultural-Historical Construction of Safety Education Programs for Preschool Children – Findings from the Pilot Study (using the SeeMore Safety program).*

The pilot study reports on the preliminary study. In addition to addressing the research questions, the purpose of the pilot study was to identify any limitations of the intervention program and testing instruments used in the trials, whilst also determining the face validity of the program.

The process of determining whether the intervention content was suitable for preschool children was undertaken independently of the researcher who designed the intervention program used – the SeeMore Safety program – to prevent any bias.

However, like all research, it has its limitations. Without a comparison group, it could not be determined whether the change that occurred in safety understanding was due to a maturation developmental process or was from a more cultural-historical perspective, where the learning was co-constructed. By engaging a comparison group, it would be possible to determine the foregrounding of the safety-related learning and framing of education programs.

Paper Two: *Safety Education Programs for Early Childhood Learners Matter – Findings from the Main Study (using the SeeMore Safety program).*

The main study builds on the findings of the pilot study by investigating how children build personal agency in safety learning to manage injury risks and safe behaviours. Unlike the pilot study, the main study involved both intervention and comparison preschool groups. The intervention preschool groups participated in the SeeMore Safety program, whereas the comparison preschools groups did not receive the formal training.

The study sought to identify significant differences between the groups to gain further understanding of safety-related learning, capacity building and personal agency in safe behaviours. The limitation of this study was that approximately only one-third of the parents returned the questionnaire.

However, the teachers reported that this was a good result based on the history of parents at these preschools returning questionnaires.

A cultural-historical construction of safety education programs for preschool children:
Findings from SeeMore Safety, the pilot study

Susie O'Neill
Marilyn Fleer
Joseph Agbenyega
Joan Ozanne-Smith
Monash University

Megan Urlichs
SafeStart Geelong

SCIENTIFIC RESEARCH HAS BEEN dealing with the problem and prevention of unintentional injury in children for some time, yet injury rates continue to increase in some areas. This paper reports on the outcomes of a study of children from seven preschools in a rural region of Australia, who were engaged in a cultural-historically designed safety education program. The study sought to examine the relations between safety knowledge and perceived action gained as a result of participation in a program called 'SeeMore Safety'. SeeMore Safety combines preschool and home-based education for children aged four to six years, their parents and teachers. Using a mixed-method research approach, the study examined how the program contributed to knowledge of injury prevention in young children. The findings demonstrated that it had a positive effect on preschool children's behaviour and reasoning about safety. The paper concludes with an argument about the need for further research into this important area of early childhood education.

Introduction

A number of studies have investigated unintentional injury and injury prevention in children (National Public Health Partnership [NPHP], 2004; World Health Organisation [WHO], 2008; Safe Kids USA, 2009). Most focus on documentation and analysis of statistical records of injuries and injury prevention programs for children, with the subsequent adoption of policies and practices for supporting safety regulations and programs across a range of settings, including preschools (Cody, 2002, 2004; NPHP, 2004; WHO, 2008; Safe Kids USA, 2009; Vic Roads, 2011). However, very little research has been directed to what kinds of programs can make the biggest difference to young children's capacity to read their environment and act with understanding in relation to their own personal safety. While some studies have been reported which question the current regulatory environment of preschools (see Little, 2006, 2010; Little and Wyver, 2008), very little is understood about how children in Australia can build personal agency for acting safely and being able to determine risk situations in their everyday lives. As such, it has become increasingly important to develop effective programs that support Australian children's understanding of acting safely, so that early childhood education can be better informed about how to support young children's learning about safety and contribute positively to injury prevention. This paper reports on the outcomes of research that evaluated an injury prevention program undertaken across seven preschools.

We begin this paper by reviewing those studies that have specifically examined injury prevention programs implemented in preschools, followed by a theoretical discussion of key concepts.

Overview of studies into preschool intervention programs

While previous research has examined the effectiveness of intervention programs that educate preschool children about specific safety issues, such as sun safety (Loescher, Emerson, Taylor, Hendrickson-Christensen & McKinney, 1995), and road safety (Thomson, Tolmie, Foot & McLauren, 1996; Whitebread & Neilson, 1998) it appears there are very few studies that have examined safety risk knowledge where behavioural change is evident. Consequently, these few but important studies are worthy of mention in relation to the study reported in this paper.

Loescher et al. (1995) conducted a feasibility study to examine whether a sun safety curriculum for preschool children affects their knowledge, comprehension and application regarding sun safety. Twelve classes recruited from local preschools were randomly assigned to either an intervention group or a control group. The intervention group received a sun safety intervention program and the control group did not. Children aged between four and five years in each group were tested at the beginning of the study about their knowledge and comprehension in relation to sun safety and received post-tests two and seven weeks following. The results demonstrated that the intervention program had a significant effect on the children's knowledge and comprehension of sun safety, although there was no significant change in the application components of cognition (Loescher et al., 1995). Although the study did not attempt to link reasoning with behavioural change, the results concluded that a structured curriculum had a positive effect on preschool children's knowledge and comprehension of sun safety. However, the limitation of the study was its inability to determine whether children were able to apply the knowledge gained to real-life contexts (Loescher et al., 1995).

Unlike Loescher et al.'s (1995) specific study of sun safety, the purpose of the present study reported in this paper was to view safety from a holistic perspective and examine whether the children could apply new learning to real-life situations. While it is reasonable to test knowledge, it is very important to also test the application of that knowledge to everyday circumstances. Although most research related to safety education programs is based on an age-related developmental approach (Safe Kids USA, 2009; WHO, 2008; NPHP, 2004; Ozanne-Smith & Williamson, 1995), the pilot study takes a theoretically broader view by drawing upon cultural-historical theory. Most studies have reported positive outcomes associated with children's knowledge of safety and suggest that these programs will reduce young children's accidents. The present study has been inspired by these research projects, but in drawing upon cultural-historical theory, goes one step further by examining the *dialectical relations* between children's knowledge of safety and their actions in everyday life. In this paper a dialectical relation between child and environment is defined as the child's awareness of their environment in relation to their knowledge of how to act safely, and a child's capacity to act safely is determined directly by the child's reading of unsafe situations within their environment.

In looking broadly at the safety literature, we have also noted that some recent studies have questioned the effectiveness of traditional preschool programs to make a positive impact upon children's understandings of safety. These studies offer some guidance for the interpretation and assumptions associated with established preschool practices for supporting children's learning about safety. For instance, Saltmarsh (2010), in drawing upon data from a study which involved observations, field notes, and informal interviews of children and staff across Australia and Vancouver, found that the effectiveness of traditional preschool programs which relied upon police and fire services for communicating knowledge of safety were problematic. Importantly, the sample analysed and reported in their paper focused on children who came from Lebanese, Egyptian, Vietnamese and Anglo-Australian families, with a mixture of single-parent families, two-parent families, blended families, and multiple combinations of first, second and third generation immigrants. Saltmarsh (2010) noted that police and fire services are commonly used in preschools for introducing the topic of safety. However, these programs are culturally situated, and including these services in preschool programs can have a negative impact on the effectiveness of the programs. Incidents of children's distress at seeing adults in uniform and in positions of authority were noted, suggesting that the traditional preschool programs which draw upon community can no longer be reliable for supporting safety programs. This research suggests the need to find new interventions and programs to support staff working with linguistically and culturally diverse groups in Australia.

Further concerns have been noted in the broader literature in relation to reducing children's opportunities to develop skills and knowledge of safety by keeping children too safe. For instance, Wyver et al. (2010), in drawing upon the concept of 'surplus safety' (see Buchanan, 1999), have undertaken an analysis of playgrounds, policies and regulations, suggesting that there is now a 'paradox of surplus safety, namely that excessive attempts to keep children safe may expose them to unnecessary risk, and disadvantage both children and their parents' (p. 264). In theorising about children's competence and confidence to think and act in safe ways, Wyver et al. (2010) have suggested that:

> *Concerns with children being injured while playing, traffic danger and stranger danger have led to an individualistic response by many parents, where they try to remove children from 'dangerous' areas and activities, rather than a collective response in which our society and our urban spaces are made safer for children. The consequence is that other longer term risks for children are emerging as legitimate concerns when surplus safety takes hold* (p. 263).

Wyver et al. (2010) further stated:

> *Learning from falling, including falling that involves cuts, bruises and other injuries, is widely recognised as important for children, even by professionals and organisations involved in injury prevention. For example, the Royal Society for Prevention of Accidents (RoSPA, n.d.) note on their website that*

> *healthy play can result in painful injuries, and this is something that should be considered part of normal development for children of all abilities. Children learn from experience of injury, but also are often much better at making judgements [sic] about risk of injury than is evident to adults involved in their care* (Christensen & Mikkelsen, 2008, p. 265).

The argument put forward by Wyver et al. (2010) is that the management of risk becomes a duty of care not only for parents but also for staff working in early childhood centres. More children are now attending childcare centres and preschools, and many are spending longer hours in care and education than in previous generations (see OECD, 2006). Consequently, the duty of care in relation to safety has increased in recent times, and it can be argued that it has become increasingly important for early childhood professionals to have access to well-designed and rigorously evaluated programs that they can confidently use in their centres. The present study seeks to examine the effectiveness of an injury prevention program designed specifically for preschool-aged children.

Theories of child development underpinning the injury prevention program

The literature reviewed in the previous section suggests the importance of using a robustly evaluated intervention program for Australian preschools. It can also be argued that the programs on offer must sit theoretically within existing practices and beliefs of early childhood education (Raban et al., 2007). In recent times, the broader early childhood curriculum literature argues for a contemporary view of child development and learning (Grieshaber, 2010; Sumsion et al., 2009) where programs are congruent with, and inclusive of, the diverse experiences of children. Designing a program to enhance children's safety behaviours needs to fit with the contemporary theories of child development that underpin the national curriculum in Australia called the *Early Years Learning Framework* (Department of Education, Employment and Workplace Relations [DEEWR], 2009), while also drawing on what is already understood about childhood injury prevention. The paradox is that the childhood injury prevention literature is based on a maturational theory of child development (WHO, 2008; Australian Bureau of Statistics [ABS], 2006; National Public Health Partnership [NPHP], 2004; Clapperton, Cassell & Wallace, 2003) while the national *Early Years Learning Framework* argues against this traditional view of child development and recommends a diversity of poststructuralist views on development and learning, including a cultural-historical view of child development.

In order to reconcile these differing perspectives for underpinning an effective safety education, we undertake in this section a brief theoretical review of a maturational view of development in relation to a cultural-historical view of child development. This is important for understanding the theoretical underpinnings of the safety program introduced and evaluated later in this paper. It is beyond the scope of this paper to present a full review of child development for this purpose, and therefore only key concepts and assumptions are discussed (see Fleer, 2010).

Central to a maturational view of child development is age. Age is used as the criterion for measuring or benchmarking what might be the expected level of biological development of the child; what a child can physically do and mentally attend to in relation to a specific age. For example, comprehensive accounts of childhood injuries are recorded against specific ages; for example, arm fractures owing to falls from playground equipment peak in the five–nine years age group (WHO, 2008; ABS, 2006; NPHP, 2004; Clapperton, Cassell & Wallace, 2003). This view of development has been contested in the early childhood education literature for more than 20 years (see Edward, Fleer & Nuttall, 2008), resulting in a mandated national curriculum in Australia (DEEWR, 2009), which does not use this view of child development (Sumsion et al., 2009). Vygotsky (1998) has argued that age cannot be used as a reliable criterion for establishing a child's developmental level, and consequently cannot be used for diagnosis in practice. The 'diagnostics of age-related development of the child' (p. 199) foregrounds the biological development of the child, rather than the child's cultural development. Using age as a criterion for development is a trait that is highly visible biologically, and standardised across children, but it gives little evidence of the cultural development of the child which is variable across communities.

A maturational view of child development that uses age as the central criterion has been termed an evolutionary view of development. In his time, Vygotsky put forward another view of development that he termed a revolutionary view of child development. He argues that it is through the child's interaction with their social and material world that they come to gain meaning of the words they hear, and begin to participate in the fullness of everyday communication with those around them. The argument is that the ideal language environment is needed for the child to come to learn language. This line of argument is also possible within safety education programs where the child is active in the learning process; for instance, where a child is learning about road safety. The child is introduced to the environment that is ideal for the new learning, which is the road. The more capable person guides the child on safe practices; for example identifying a safe place to cross traffic lights, allowing them to press the walk button and watching for traffic, and so on. The child's interactive experience with the more knowledgeable person is in the ideal environment needed for road safety learning to take place.

What Vygotsky (1994) suggests is that 'something which is only supposed to take shape at the very end of development, somehow influences the very first steps in this development' (p. 348), and it is this engagement with the ideal environment that supports a child's higher mental functions. What is evident in a cultural-historical view of development is that 'specifically human characteristics and forms of activity' act as 'a source of development' (p. 351) rather than simply the unfolding of a biological map of child development linked to a child's age. The relations between the child and their environment become not only the source of development, but also acts as the unit of analysis for determining development, as noted when Vygotsky (1994) writes:

> *One example of such a unit is the emotional experience [perezhivanie]. An emotional experience [perezhivanie] is a unit where, on the one hand, in an indivisible state, the environment is represented, i.e. that which is being experienced—an emotional experience [perezhivanie] is always related to something which is found outside the person—and on the other hand, what I represented is how I, myself, am experiencing this, i.e., all the personal characteristics and all the environmental characteristics are represented in an emotional experience [perezhivanie]; ... So, in an emotional experience [perezhivanie] we are always dealing with an indivisible unity of personal characteristics and situational characteristics, which are represented in the emotional experience [perezhivanie]* (p. 342; Original emphasis).

Bozhovich (2009) argues that the 'concept of the place that children occupy within the system of social relationships available' (p. 75) is also important. A child who is positioned as knowledgeable within a family, in regards to being able to determine safe situations, is more likely to be granted more freedom to explore than a child who has a different kind of social position, such as that of younger children being cared for by others. Whether the children are capable of meeting the demands placed upon them (Bozhovich, 2009, p. 75–76) will influence whether or not the child will strive towards a new social position within their environment.

The aim of the present study was to evaluate the suitability of a program called SeeMore Safety, which was based on a cultural-historical view of child development. The program is detailed in the following section, as is the study design.

The study

The study was conducted as a pilot by the Geelong City Council's 'Safe Start Program' in consultation with the first author, who developed the SeeMore Safety preschool program.

SeeMore Safety (O'Neill, 2006) has been developed as a safety intervention program for preschool children, focused on learning through literature and real-life experiences. The preschool program provides a variety of activities and ideas for promoting safety that are focused on six children's storybooks supported by resources for teachers and parents (O'Neill, 2006). The books are customised for each child by placing the children's photographs in the books. In personalising the messages, the program includes: a teacher's guide; a class set of six A4 children's picture books; 25 sets of six A5 children's take-home picture books; card games; activity sheets; a song on CD; and a class poster set of six, all focusing on safe practices. The children engage with the program at two levels: as a member of the class at the preschool centre and as an individual at home. The safety messages are focused on six themes: at preschool, on a walk, in the car, on a bike, at the beach, and with a friend. The types of messages include safe places to play, watching out for cars reversing from driveways, wearing appropriate restraints in cars, wearing helmets on bikes, protection from the sun, and how to be a good friend.

The pilot study addressed the following research questions:

1. How do preschool children perceive safety, safe and unsafe situations?
2. Do children gain safety awareness, knowledge and problem-solving skills from the SeeMore Safety program?
3. Is the SeeMore Safety program effective in changing children's safety perceptions and behaviours?

The assumptions underpinning the research

1. Safety education programs designed for children attending preschool can provide a foundation for children to develop an integrated understanding of how to recognise, analyse and respond to potentially risky situations.
2. Safety is a skill, that through first-hand experiences, within a child-centred learning environment supported by parents, can be developed to enhance children's ability to manage decisions about their own safety.
3. Whilst the intention of the intervention program is to enhance children's safety behaviours and understanding of safe and unsafe situations, the aim of the pilot study was to evaluate the suitability of the SeeMore Safety program content for the purpose intended.

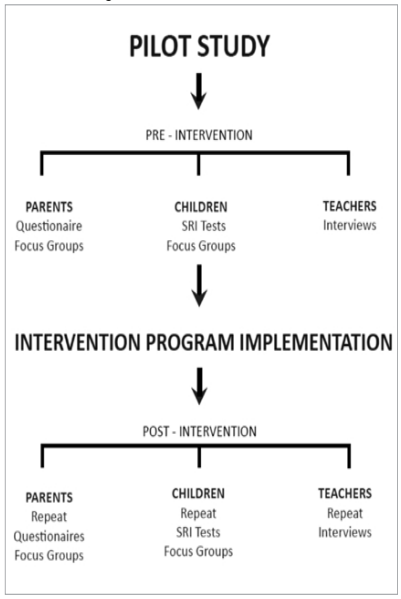
Method and study design

The pilot study combines quantitative and qualitative approaches in order to understand safety more fully than is possible by using one paradigm alone (Gay, Mills & Airasian, 2009).

Data collection approaches

Data collection methods included focus group discussions, interviews and observations, surveys, and tests pre- and post-intervention. Preschools were recruited by the City of Greater Geelong (CoGG) via email. Seven preschools applied to trial the program from geographically diverse areas across the Geelong municipality, representing a cross-section of socio-economic communities and wide range of ethnic and cultural backgrounds. A representation of the pilot study design, which is a preliminary study design for a potential larger controlled trial, is shown as a flow chart in Figure 1.

Figure 1. Flow chart showing proposed overall study design



The sample

Data were collected from participants from the seven preschools over 20 weeks (Table 1). The data included three sources: children, parents and teachers. The number of children that completed pre- and post-testing procedures in each preschool group varied between nine and 58 children aged between four and six years.

Children: 198 children participated in pre- and post-testing procedures and focus group discussions to generate information about changes in their knowledge and attitudes about safety as a result of participating in the safety education program.

Parents: 147 parents completed pre- and post-intervention questionnaires and engaged in focus groups to provide more detailed information on their child's safety knowledge and risk-taking behaviours at home and outside the preschool setting.

Teachers: Seven teachers engaged in informal interviews to generate information about changes in children's safety knowledge and risk-taking behaviours at preschool and provided insights into their views on the effectiveness of the intervention materials.

Table 1. Sample size: Preschools and participants

Preschool	Children	Parents	Teachers
PreSP1	9	8	1
PreSP2	35	9	1
PreSP3	14	8	1
PreSP4	58	52	1
PreSP5	27	20	1
PreSP6	39	41	1
PreSP7	16	9	1
Total	**198**	**147**	**7**

Ethics

Ethical issues relating to conducting research involving children were considered. Participation was voluntary and consent forms were received from parents and teachers. Names of the participants that appear in this paper are pseudonyms; the identities of preschools were protected via a coding system.

Instruments

Two new instruments were developed to measure the effect of the intervention program.

The first instrument, named the Safety, Knowledge, Skills and Behaviour (SKSB) checklist (O'Neill, 2006) is rated by parents for the occurrence of safety-related behaviours of their children. The SKSB is adapted from the Injury Behaviour Checklist (IBC), a validated measure used in studies of behaviour correlates of childhood injury (Speltz, Gonzales, Sulzbacher & Quan, 1990). The IBC consists of 24 injury-related child behaviours rated by parents for the frequency of occurrence on a five-point scale, ranging from zero (not at all) to four (very often/more than once a week). In previous studies the IBC scores were found to be moderately predictive and highly reliable of the actual injuries as reported by parents. Thirteen items from the

Table 2. Pre and post mean child SRI test results

Preschool	Number of children	Mean	Score	+1	STD	% Mean difference
	Pre- & Post-test	Pre- test	Post- test	Pre- test	Post- Test	
PreSP 1	9	19.9	22.8	4.9	2.7	15.1
PreSP 2	35	20.6	23.0	4.0	1.9	12.7
PreSP 3	14	20.5	23.0	6.1	1.4	13.6
PreSP 4	58	20.4	22.8	3.5	1.3	12.9
PreSP 5	27	19.8	22.7	6.5	0.8	16.8
PreSP 6	39	19.8	23.3	5.8	1.3	18.8
PreSP 7	16	20.3	21.4	3.5	4.9	6.4
Total	**198**	**20.2**	**22.7**	**4.9**	**2.0**	**0.1**

24 questions used in the IBC have been reworded for the SKSB to better correspond with the content of the SeeMore Safety program, but are similar. The remaining 11 questions were derived from the storylines depicted in the SeeMore Safety picture books. The SKSB contains 24 questions related to safety behaviours of children rated by their parents for the frequency of occurrence at two time intervals, pre- and post-intervention. The scoring system used for collecting data is based on a five-point scale from one (never) to five (almost always). The SKSB provides a space for parents to add additional comments on their child's safety-related behaviours. The collection of this data along with focus groups and group discussions provides data for qualitative analysis to support the quantitative findings.

The second instrument, named the Safety Risk Intelligence (SRI) test (O'Neill, 2006) was specifically developed to measure children's safety comprehension. The SRI test designed for children includes picture cards depicting safe and unsafe behaviours. Children are randomly selected for groups of four. Each child is presented initially with two cards, a card with a happy face and the word 'safe', and the other card with an unhappy face and the word 'unsafe'. The child then receives an additional 20 cards without the safe/unsafe indicators, face down. The child is asked to turn the cards over and sort them into two piles, 'unsafe' and 'safe'. A score out of 20 is given for correct placement of cards, and out of five for response time. The response time is based on a five-point scale ranging from one point (for five minutes and over) and five points (for one minute or less). Although the children were unaware at the time that they were being timed, the response time is relevant in relation to real-life safety risk situations that require children to respond in a timely manner. The children are not informed at any stage during the pre- and post-SRI testing procedure of correct and incorrect responses. Following the testing procedure, in their small groups, children share perceptions on safe and unsafe situations with the researcher and other children. During this time the researcher presents pictures of real-life situations that correlate with the illustrated cards, to gauge whether similar responses are provided.

Procedure

A parent information session was held on the SeeMore Safety program in each of the participating preschools. Parents were provided with a consent form and a SKSB checklist to complete. In the weeks following, the Geelong City Council officers visited each preschool group and invited the children to participate in the SRI test prior to the commencement of the intervention. Following the SRI testing procedure, the program resources were distributed to the preschools at the beginning of Term 3, 2008. Although there was no charge for the participating preschools, it is estimated that the program delivery and resources would cost approximately $100 per child for a 12-month program.

Following the completion of the intervention program a final parent focus group session was held where parents shared their comments on its effectiveness. Post-SRI testing procedures and focus group discussions were also conducted with the children to gauge changes, if any, in the children's knowledge and attitudes about safety, and teachers were interviewed to obtain their perspectives about the effectiveness and suitability of the program.

Data entry and analysis

The Greater City of Geelong officers chose to record the data via written documentation.

The parent questionnaires were collected and placed into Excel spreadsheets, arranged by preschool. Scores were recorded in a table format and the qualitative data

in word format. The data were analysed using the SPSS 17 software (SPSS, 2008). First summary data tables are presented for children and parents. Second, the results of statistical tests in the form of a mixed-model factorial ANOVA analysis for pre- and post-intervention tests are displayed. The distribution of mean scores for pre- and post-measures have shown differences indicating that the SeeMore Safety program is effective in building children's and parent's knowledge about safety and risk. The statistical aspects of the results are presented, followed by qualitative comments.

The results provided in Table 2 are the pre- and post-test scores from the SRI test for the same children from each of the seven preschools. Any children not present at both the pre- and post-tests were excluded from the sample. The results indicate the score increased from pre- to post-test for each preschool. Except for PreSP 7, the standard deviation of the score has decreased for all other preschools. This indicates that, while the value of the scores increased, the variability of the scores decreased. The small standard deviation recorded for PreSP 5 post-test score (0.8) suggests the distribution of the children's responses are tightly concentrated around the safety measures.

Figure 2. Variations between the mean preschools' children pre and post scores.

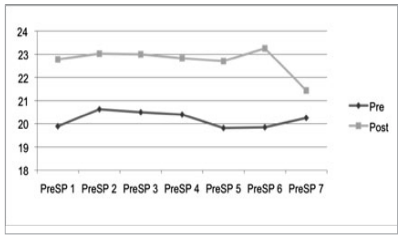


Figure 2 shows that there is less variation between the preschools, pre- or post-measures. Whilst post-test scores are consistently higher than the pre-test scores for all preschools, PreSP 6 experienced the largest increase, and PreSP 7 the least. A possible factor that may have contributed to PreSP 7's lower score was that the preschool was situated in a lower socio-economic area with a range of ethnic and cultural backgrounds. The children from this preschool may have had less experience and opportunity. However one would presume that the pre-test score would have been lower for the same reason, which was not the case.

Table 3 reports repeated measures ANOVA of two factors under consideration: (1) the within-subjects factor, which in most cases represents some sort of time factor or pre/post factor, and (2) the between-subjects factor, the preschool.

The data analysis reveals that although there are differences in pre- and post-scores at the 1% level (that is, $p \leq 0.01$), there was no statistical significance in regards to the preschools. Mean and standard deviation comparisons are presented in Table 2.

It was important to also compute the parents' pre- and post-measures on the SKSB. Table 4 shows changes in the SKSB checklist results for parent reports of their child's risk-taking behaviours and safety knowledge. The results show an increase from pre to post scores for each preschool. Consistent with the child results, the standard deviations of the parent score decreased for all schools. This again indicates that while the scores increased, the variability of the scores decreased.

Figure 3. Comparison of the mean preschools' parent pre and post scores by preschool

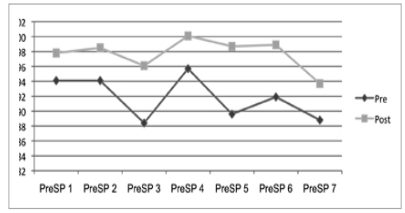


Figure 3 represents the variation between the parent pre and post scores. Consistent with child scores, the parent post scores are significantly higher.

At the completion of the program, the seven teachers were invited to comment on the program in relation to any changes they observed in children's safety knowledge and behaviours at preschool and the effectiveness of the intervention materials. Teachers from three of the seven preschools provided feedback during formal interviews and the remaining four teachers provided general comments by phone.

The teachers were asked how the children engaged in the program, all providing positive feedback. Teacher One reported that 'all participated in discussions and activities, enthusiastically and positively' (PreSP 1). In

Table 3. Within-subjects pre- and post-test results

Source Pre Post	Type III Sum of Squares	df	Mean Square	F	Sig
Pre Post Linear	443.417	1	443.417	163.570	.000
Pre Post* School Linear	31.860	6	5.310	1.959	.073
Error (Pre Post) Linear	517.777	191	2.711		

Table 4. Pre and post parent SKSB checklist results

Preschool	Number of parents	Mean	Score	+1	STD	% Mean difference
	Pre- & Post-test	Pre- test	Post- test	Pre- test	Post- Test	
PreSP 1	9	94.1	97.8	9.6	5.7	4.4
PreSP 2	8	94.1	98.5	7.8	2.7	5.1
PreSP 3	8	88.4	96.1	9.1	4.7	9.5
PreSP 4	52	95.7	100.1	8.3	5.8	5.1
PreSP 5	20	89.6	98.7	11.0	7.3	11.2
PreSP 6	41	91.9	98.9	9.2	6.0	8.4
PreSP 7	9	88.8	93.7	9.4	5.6	6.1
Total	**147**	**91.8**	**97.7**	**9.2**	**5.4**	**0.4**

relation to safety awareness, the teachers noted that there was a perceived increase and made reference to children's play: 'in children's play, discussions and comments, give rise to awareness of issues and new learning' (PreSP 1). Teachers observed a change in behaviour in both the children and the families. This was demonstrated during bike safety day, where children were not only wearing helmets, but were conscious of the need for helmets and appropriate size of bikes: 'on bike riding day children were conscious of helmets and sizes of bikes' (PreSP 6).

Figure 4. Child demonstrating helmet and bike sizing on Bike Safety Day

All teachers commented on the take-home books stimulating discussion at home and how they provided opportunity for the children to share their new learning with their families, making the program more meaningful. One teacher reported that the take-home picture books were 'absolutely beneficial, as the program can be supported by parents and families. Children love the books and have ownership of them to teach other family members' (PreSP 6).

Figure 5. Child sharing new learning with siblings

Preschools engaged in other safety-related activities to complement the SeeMore Safety program. Several preschools held a bike safety day to celebrate the bike-themed book and ventured on walks around the block, crossing at traffic lights and school crossings with the lollipop lady, to put into practice what was presented in the SeeMore Safety books.

In relation to the content of the program, the teachers believed it was relevant to children's daily care and education. However one teacher felt it 'would be better embedded into the curriculum, rather than being a stand-alone program' (PreSP 1). Changes to the resources included minor word changes in the books and picture changes to three of the testing cards.

Discussion

The findings of this study indicate that the intervention program had a positive effect on children's behaviour and reasoning about safety. It can be argued that a well-designed safety education program for preschool children that adopts a cultural-historical theory can lead to children developing a strong sense of safety irrespective of age (Vygotsky, 1994; Rogoff, 2003; Fleer, 2010).

Teacher feedback identified that the program was effective and content suitable for preschool children. Generally, results revealed that participant's knowledge of safety and risk improved.

Although children worked independently to complete the SRI test, the CoGG officer placed the children in groups of four for the discussion sessions. This provided the opportunity to engage the children in discussions about their perspectives on safety with others after completing the test. Aspects of Vygotsky's (1954) cultural-historical theory promoting the concept of dialectical relations which leads to co-construction of learning and meaning making was evident in the way the CoGG officer interacted to gain insight into the children's way of thinking about safety. On several occasions the children selected a safe card as unsafe. For example, one of the cards picturing a beach scene had SeeMore supplying sunscreen to the hand of a child. The children in one group believed this was an unsafe picture because they were concerned that the drip of sunscreen protruding from the bottle could spill, causing someone to slip. The dialectical relationship in this situation provided opportunity for the co-construction of learning (Anning, Cullen & Fleer, 2004). Through interacting with adults and other children, the children imagined the situation, acquiring an understanding of the consequences of the drip posing an unsafe situation. The children's learning experiences have gone beyond the construction of safety knowledge and skills, cultivating flexible and responsible application of risk ideas gained through the program to imagine real-life contexts. Here is an example of cultural-historical theory subsumed within post-structural theory of child development, where the learning process not only recognises the learner as an active participant, but productive in the building of identity. The learner's sense of self is as a legitimate participant in safe reasoning.

Consistent with the child test results, an increase was also recorded from pre- to post-test scores for the parents. As explained in Table 4, there were noted positive changes in children's risk-taking behaviours, and increased safety knowledge was recorded in the SKSB checklist reported by parents following intervention. The test results support the positive effect safety intervention programs had on preschool children's knowledge and comprehension in regards to sun safety (Loescher et al., 1995).

The SeeMore Safety pilot study findings supported the evidence provided by Heck, Collins and Peterson (2001) of risky behaviour being decreased following intervention, and the sun safety feasibility study results discussed in the introduction (Loescher et al., 1995). Both studies suggested that a structured intervention program had a positive effect on preschool children's knowledge and understanding regarding safety. In contrast to the sun safety study, the SeeMore Safety pilot study attempted to link cognition with behavioural change. Positive safety habits were noted in the children by the teacher as well as the parents. In one case, twins who previously had been walked to preschool by their grandparent on a leash no longer needed to be restrained. In another, a father who rode a bike to preschool with his son as a passenger, with neither previously wearing helmets, now both wore helmets.

There appeared to be a change in the perception of 'unsafe', as terminology used by the children to describe unsafe situations changed. During the pre-testing stage, the children perceived 'unsafe' to reflect a negative situation and made reference to unsafe using words such as 'naughty' and 'bad'. In the post-tests, the officer noted that although some children continued to use similar words, new terms appeared, such as 'you could get hurt' and 'dangerous'. During a class discussion the teacher asked the children how their visits to their new school went, and one little boy replied, '1 felt unsafe' (PreSP 6).

Valuable knowledge on best practice in regards to data collection involving parents was gained through feedback provided by parents participating in the pilot study. It was acknowledged that the delivery method of the parent questionnaire, the SKSB checklist, limited opportunities for the parents to engage with the researcher. Recommendations included changes that would refine the procedure and encourage better parent engagement. It was suggested that the researcher be available to discuss the study with parents prior to or following a preschool session.

Although the materials were found to be effective, the resource intensive nature of this program could potentially pose limitations to preschools not being able to afford the program. To overcome this and make the program affordable, it was suggested that the resource kit could be delivered in two sections; a base kit which would contain the teachers' manual, doll, CD and posters that could be reused; and a book set that included the class and individual books that would be replaced each year. Another recommendation was to reduce the number of titles in the set to four, which would allow the teachers to focus on one theme per term whilst reducing the costs of the book set. A further suggestion was to have the book sets sponsored or subsidised by council or corporate funding.

As with this study, it will be difficult in future studies to ascertain whether children participating in the SeeMore Safety program gained greater safety awareness, knowledge and problem-solving skills solely from engaging in the program itself, compared with general preschool safety education programs offered. As the SeeMore Safety program encourages preschools to incorporate other safety education resources specific to the topics being taught to complement the SeeMore Safety program, these programs could also play a role in increasing safety knowledge. To gain solid evidence on the effectiveness of such a program in linking cognition with behaviour change, a longitudinal study is recommended, as short-term studies will have limitations due to only measuring the short-term effects on preschool children's knowledge and comprehension in regards to safety.

Conclusion

In conclusion, the findings of the Geelong Pilot Study revealed that the SeeMore Safety program had a significant effect on the children's safety knowledge, self-awareness and comprehension. From a cultural-historical perspective the SeeMore Safety program embraced the children's social and material worlds to enable them to conceptualise safety. Children's interactive experiences with the more knowledgeable person through the SeeMore Safety program demonstrated how in an ideal environment and situation, safety learning can take place. This is consistent with Vygotsky's (1994) concept of ideal and real situations being present within a child's environment. The children demonstrated responsible application of risk management knowledge and skills gained through the program to real-life contexts. Parents and teachers reported on change to children's attitude and relationship to their environment and consciousness of their new safety knowledge, as demonstrated during the bike riding activity. The child being conscious of the size of the bike and rider required a deeper order of thinking where both intellectual and affective components were engaged (Bozhovich, 2004). The children were able to create new levels of consciousness of positive safety practices in relation to their situation in the environment, and recognise whether the situation or act was safe or unsafe—this in itself is a source of development. Safety learning was constructed in networks of social practices that included teachers, parents and children, who in the process have influenced the extent to which children recognised themselves as capable and engaged participants. The findings suggested that not only was there evidence of child agency for acting safely with understanding, but there was also substantiation of the learner's sense of self as a valid participant in safe reasoning.

The Geelong City Council's 'Safe Start Program', which conducted the pilot study independently from the researcher, concluded that the program content was suitable and effective for preschool children. The pilot study identified the reliability of the child SRI testing instrument and parent SKSB checklist. However, without a comparison group, the foregrounding of learning could not be determined. Therefore the study was unable to conclude whether this was due to a maturation developmental process or as argued from a more cultural-historical perspective, where through SeeMore Safety the learning has been co-constructed through a social process. For this reason, it is suggested that there is the need to have a comparison group to determine the underpinnings of the safety-related learning and framing of education programs.

References

Agbenyega, J. (2009). The Australian Early Development Index, who does it measure: Piaget or Vygotsky's child? *Australasian Journal of Early Childhood*, *34*(2), 31–38.

Anning, A., Cullen, J., & Fleer, M. (2004). *Early childhood education, society and culture*. London: Sage Publications.

Bozhovich, L. I. (2004). L.S. Vygotsky's historical and cultural theory and its significance for contemporary studies of the psychology of personality. *Journal of Russian and East European Psychology, 42*(4), 20–34.

Bozhovich, L. I. (2009). The social situation of child development. *Journal of Russian and East European Psychology, 47*(4), 59–86.

Buchanan, C. (1999). Building better playgrounds: A project for parents? *UAB Magazine, 19*(3), from http://main.uab.edu/show.asp?durki=25353.

Cody, B., Mickalide, A., Paul, H., & Colella, J. (2002). *Child passengers at risk in America: A national study of restraint use*. Washington, DC: National SAFE KIDS Campaign.

Cody, B., Quraishi, A., Dastur, M., & Mickalide, A. (2004). *Clear danger: A national study of childhood drowning and related attitudes and behaviors*. Washington, DC: National SAFE KIDS Campaign.

DEEWR (Department of Education, Employment and Workplace Relations). (2009). *Belonging, being and becoming: The Early Years Learning Framework for Australia*. Canberra, ACT: Australian Government Department of Education, Employment and Workplace Relations for the Council of Australian Governments.

Edwards, S., Fleer, M., & Nuttall, J. (2008). *A research paper to inform the development of the Early Years Learning Framework for Australia*. Victoria: Office of Children and Early Childhood Development, Department of Education Early Childhood Development, from www.deewr.gov.au/EarlyChildhood/Policy_Agenda/Pages/home.aspx.

Heck, A., Collins, J., & Peterson, L. (2001). Decreasing children's risk taking on the playground. *Journal of Applied Behavior Analysis*, vol. 34, 349–352.

Heckman, J. J., & Masterov, D. V. (2007). *The productivity argument for investing in young children*. Discussion paper 2725. Bonn: Institute for Labour Study.

Hedegaard, M., & Fleer, M. (2008). *Studying children. A cultural-historical approach*. England: McGraw-Hill Education.

Gay, L., Mills, G., & Airasian, P. (2009). *Education research competencies for analysis and applications*. New Jersey, NJ: Pearson Education.

Grieshaber, S. (2010). Departure from tradition: The *Early Years Learning Framework* for Australia. *International Journal of Child Care and Education Policy, 4*(2), 33–44.

Jordan, B. (2004). Scaffolding learning and co-constructing understanding. In A. Anning, J. Cullen & M. Fleer (Eds), *Early childhood education: Society and culture* (pp. 31–42). London: Sage Publications.

Kravtsova, E. (2008). *Zone of potential development and subject positioning.* Paper presented at Vygotsky symposium, Monash University, Peninsula campus, 17 December.

Little, H. (2006). Children's risk-taking behaviour: Implications for early childhood policy and practice. *International Journal of Early Years Education, 14*(2), 141–154, from http://dx.doi.org/10.1080/09669760600661427.

Little, H. (2010). Risk, challenge and safety in outdoor play: Pedagogical and regulatory tensions. *Asia-Pacific Journal of Research in Early Childhood Education, 4*(1), 3–24.

Little, H., & Wyver, S. (2008). Outdoor play: Does avoiding the risks reduce the benefits? *Australian Journal of Early Childhood, 33*(2), 33–40.

Loescher, L., Emerson, J., Taylor, A., Hendrickson-Christensen, D., & McKinney, M. (1995). Educating preschoolers about sun safety. *American Journal of Public Health, 85*(7), 939–943.

NPHP (National Public Health Partnership). (2004). *The National Injury Prevention and Safety Promotion Plan: 2004–2014.* Canberra.

OECD (Organisation for Economic Co-operation and Development). (2006). *Starting strong II. Early childhood education and care*. Paris: Organisation for Economic Co-operation and Development.

O'Neill, S. (2006). *SeeMore Safety.* Ballarat: KIDS Foundation.

Ozanne-Smith, D., & Williams, F. (1995). *Injury research and prevention: A text.* Clayton: Monash University Accident Research Centre.

Prince, J. (2011). Looking out for the kids. *Fundraising and Philanthropy Australasia, 33,* August/September.

Raban, B., Nolan, A., Waniganayake, M., Ure, C., Brown, R., & Deans, J. (2007). *Building capacity. Strategic professional development for early childhood practitioners.* Victoria, Australia: Thomson Social Science Press.

Rogoff, B. (2003). *The cultural nature of human development.* New York: Oxford University Press.

Safe Kids USA. (2009). *Raising safe kids one stage at a time. A study of child development and unintentional injury.* Washington. Retrieved 1 February 2011 from www.usa.safekids.org.

Saltmarsh, S. (2010). Lessons in safety: Cultural politics and safety education in a multiethnic early childhood education setting. *Contemporary Issues in Early Childhood, 11*(3), 288–298.

Sumsion, J., Cheeseman, S., Kennedy, A., Barnes, S., Harrison, L., & Stonehouse, A. (2009). Insider perspectives on developing Belonging, Being and Becoming: The *Early Years Learning Framework* for Australia.

Speltz, M., Gonzales, N., Sulzbacher, S., & Quan, L. (1990). Assessment of injury risk in young children: A preliminary study of the injury behaviour checklist. *Journal of Pediatric Psychology, 15*(3), 373–383.

SPSS for Windows, Version 17, 2008. Chicago: SPSS Inc.

Thomson, J. A., Tolmie, A., Foot, H. C., & McLauren, B. (1996). *Child development and the aims of road safety education: A review and analysis road safety research,* report No. 1. UK: Department for Transport. www.dft.gov.uk

Vic Roads. (2011). *Traffic safety education: Directions and Action Plan 2008–2010 Victoria.* Retrieved 1 May 2011 from www.arrivealive.vic.gov.au.

Vygotsky, L. (1929). *Mind in society.* Cambridge, MA: Harvard University Press.

Vygotsky, L. (1994). The problem with the environment. In R. van der Veer & J. Valsiner (Eds), *The Vygotsky reader*, (pp. 338–354). Oxford: Blackwell.

Vygotsky, L. (1987). *Thought and language.* Cambridge, MA: MIT Press.

Whitebread, D., & Neilson, K. (1998). *Cognitive and metacognitive processes.* Report No. 06. UK: Department of Transport. www.dft.gov.uk.

Peden, M., Oyegbite, K., Ozanne-Smith, J., Hyder, A., Branche, C., Rahman, F., Rivara, F., & Bartolomeos, K. (Eds) (2008). *World report on child injury prevention.* Geneva: WHO Press.

Wyver, S., Tranter, P., Naughton, G., Little, H., Hansen Sandseter, E. B., & Bundy, A. (2010). Ten ways to restrict children's freedom to play: The problem of surplus safety. *Contemporary Issues in Early Childhood, 11*(3), 263–277.

School codes:

Pilot Study Preschool 1 = PreSP 1

Pilot Study Preschool 2 = PreSP 2

Pilot Study Preschool 3 = PreSP 3

Pilot Study Preschool 4 = PreSP 4

Pilot Study Preschool 5 = PreSP 5

Pilot Study Preschool 6 = PreSP 6

Pilot Study Preschool 7 = PreSP 7

Chapter 5

Safety Education Programs for Early Childhood Learners Matter: Findings from the SeeMore Safety program, the Main Study

Susie O'Neill

Abstract

High childhood injury rates worldwide have prompted health and educational professionals to explore strategies to address the problem and to prevent unintentional injury in children. Building on the findings of a pilot study, this paper reports on a study involving 302 children from eight preschools in regional Victoria, Australia. The study uses quantitative and qualitative methods to examine the effect of a cultural-historical informed preschool safety education program named "SeeMore Safety".

To determine the underpinnings of the safety-related learning and investigate how children build personal agency in safe behaviours, the study sought to identify significant differences between two groups. The study findings show the safety conceptualisation of children from the intervention preschools improved more significantly than that of the children from the comparison preschools. The study also determined that the improved safety learning was due to more than a maturation developmental process, where learning was advanced through participation in the intervention program.

Key words: Early childhood, education, injury risk, injury prevention, preschool, safety

Introduction

After infancy, unintentional injury is the leading cause of death and disability in children worldwide despite the fact that there has been a reduction in childhood injuries in many countries (WHO, 2008). Previous studies of the outcomes of child-centred safety education programs at primary and secondary school level over several years have demonstrated their potential to enhance children's ability to gain knowledge and comprehension to responsibly manage their own safety (Cody, Mickalide, Paul, & Colella, 2002; Cody, Quraishi, Dastur, & Mickalide, 2004; Loescher, Emerson, Taylor, Hendrickson-Christensen, & McKinney, 1995; NPHP, 2004; Safe Kids USA, 2009; VicRoads, 2011; WHO, 2008). However, our literature review revealed that scientific evaluations at the preschool level are less common than studies at a higher level. This study aimed to systematically investigate whether a safety education program is effective at preschool level.

In this study, SeeMore Safety, a shared-learning injury prevention program, is the primary resource delivered through preschools and supported by parents (O'Neill, Fleer, Agbenyega, Ozanne-Smith, & Urlichs, 2013). This program provides an opportunity for children to engage in decision-making processes, while many other injury prevention programs focus on modification of the environment or limiting experiences through negative reinforcement (i.e. the "don't" messages) from teachers and parents (Ryan, 2005). Conventional approaches often fail to combine methods that recognise children's ability to draw on their acquired safety knowledge and skills to more effectively manage a potentially dangerous situation (Heck et al., 2001).

The study's aim was to determine whether a child-centred, shared-learning approach supported by parents and teachers is significantly more effective than conventional approaches at increasing safety conceptualisation to enhance children's ability to manage their own safety. The study was conducted in the Ballarat region of the state of Victoria, Australia.

Research Hypotheses

(1) That safety education programs designed for preschool children can provide a foundation for children to develop an integrated understanding of how to recognise, analyse and respond to potentially risky situations.

(2) That safety is a skill that through everyday life experiences linked to curriculum resources and programs can be developed to enhance children's ability to manage decisions about their own safety.

Research questions.

(1) How do preschool children perceive safety, safe and unsafe situations?

(2) Do children gain greater safety awareness, knowledge and skills from the SeeMore Safety program compared with general preschool safety education programs, if any?

(3) Is the SeeMore Safety program effective in changing children's safety perceptions and behaviours?

Pilot Study

A pilot study was undertaken by the City of Greater Geelong through its SafeStart program. To limit any potential bias, the pilot study was conducted in consultation with, but independently of, the first author who developed the intervention program. The pilot aimed to identify any shortcomings of the program, and to determine the suitability of its content for preschool children (face validity). This process also aimed to determine the reliability of testing instruments and to inform the sample size for the main study (O'Neill et al., 2013).

Study Design

Due to a combination of qualitative and quantitative questions that are explored in this study, a mixed-method research design was adopted (Gay et al., 2009) with a cluster sampling quasi-experimental design involving pre and post-intervention methods.

Methods. The methods for data collection included focus groups, interviews, questionnaires and tests, pre- and post-intervention. Preschools were selected via a stratified random-cluster sampling process to provide a cross-section of socio-economic communities within a 100-kilometre radius of the city of Ballarat. Four intervention preschools trialled SeeMore Safety and four comparison preschools delivered their usual curriculum, which may have included conventional child safety education programs.

Figure 5.1 provides a schematic representation of the study design, methods and timeline.

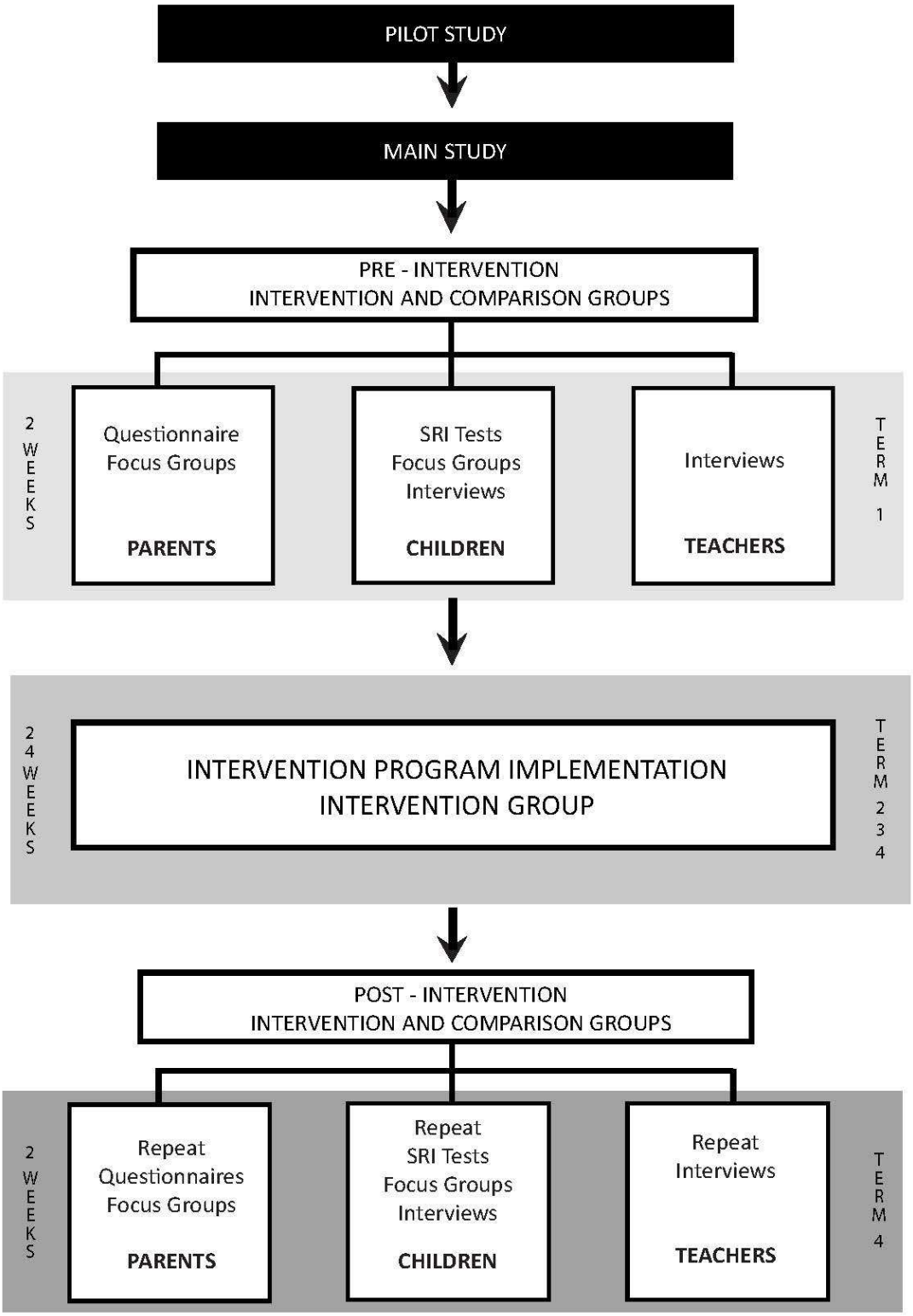


Figure 5.1. Progression of research stages and participants.

The sample. The study, undertaken over a 28-week period, included 302 children aged 4–6 years, 91 parents and eight teachers from eight preschools (Table 5.1). The intervention and comparison groups participated in the pre- and post-testing procedures. Three sources were engaged to strengthen the validity and explanatory power of the study findings. Only children present at both the pre- and post-tests from both groups were included.

Table 5.1

Sample Size, Preschools and Participants

Groups	Preschools	Children	Parents	Teachers
Intervention	4	152	58	4
Comparison	4	150	33	4
Total	8	302	91	8

Children

How children perceive safety, safe and unsafe situations was investigated through pre- and post-intervention tests, focus groups and interviews. Any changes in the children's knowledge and attitudes to safety were also recorded.

Parents

Through questionnaires and focus groups, parents provided information on their child's out-of-preschool risk-taking behaviours and safety knowledge.

Teachers

Any changes observed in children's safety knowledge and behaviours at preschool were identified through semi-structured interviews with teachers.

Ethics. Ethics approval was received from the Monash University Human Research Ethics Committee (MUHREC). Pseudonyms are used to protect child, parent and teacher privacy and confidentiality, and preschools are coded. An independent scriber was engaged to record transcripts.

Intervention program. The intervention program is focused around a series of themed picture books relevant to Australian child safety. The four selected themes were safety at preschool; at

doll and teachers' guide, aim to engage the children at two levels: as a class-member, and individually, using the take-home books. The program is underpinned by a cultural-historical approach (O'Neill et al., 2013).

Instruments. Since suitable validated instruments could not be found for the purpose, one existing instrument was adapted and an additional new instrument was developed. The first instrument, the Safety, Knowledge, Skills and Behaviour (SKSB) Checklist, is rated by parents for the frequency of their children's relevant behaviours. The SKSB Checklist is modelled on the Injury Behaviour Checklist (IBC), a validated instrument used in studies of childhood injury-related behaviour (Speltz et al., 1990). Previous studies have found IBC scores to be moderately predictable and highly reliable for injuries as reported by parents (Speltz et al., 1990).

The SKSB uses 13 of the 24 IBC injury-related behaviour questions, which have been slightly reworded to better correlate with the intervention program. The eleven additional questions relate to the storylines in the program books. The SKSB Checklist requires parents to rate their child's level of engagement with each of the 24 safety behaviours on a five-point scale at two time intervals: pre- and post-intervention. Scoring is based on points ranging from "1 = never" to "5 = almost always". The pilot study provided face validation of this adapted instrument. Parents' comments on their child's risk-taking behaviours and safety knowledge were collected following administration of the SKSB Checklist.

The second instrument, the Safety Risk Intelligence (SRI) Test, was designed to measure children's safety comprehension. It includes 20 picture cards showing 10 unsafe and 10 safe behaviours. Scores from 0 to 20 were recorded for correct placement of cards, and for response times, scores ranged from 5 for one minute or less, to 1 for five minutes and over. Children were not informed that they were being timed as the aim was to obtain comprehensive responses rather than have them treat the activity as a race.

Focus group discussions followed these tests to gauge perceptions on safe and unsafe situations. Pictures of real-life situations that corresponded with the illustrated cards were used to determine whether such pictures provided similar responses. Whilst the two instruments were largely new measures, the pilot study and use of components of an existing validated instrument provided limited validation.

Statistical analysis. Data was entered into Excel spreadsheets arranged by preschool. A mixed-model factorial ANOVA analysis was conducted on the results of the child SRI Test and parent SKSB Checklist pre- and post-intervention using the SPSS 17 software (SPSS, 2008).

Focus groups

The focus group structure and design was developed according to standard methods (Krueger & Casey, 2000*;* Polgar & Thomas, 2008). Children and parents were engaged in focus group discussions pre- and post-intervention.

Interviews

Two groups of four children were randomly selected by the teachers from each of the eight preschools. Each selected child was given a camera to take home. Teachers informed parents of the camera's purpose and parents instructed their children to photograph "safe" and "unsafe" things around their homes under parental supervision. The photos then prompted discussion, which was recorded on DVD and notes, about safe and unsafe situations, and behaviours and consequences of actions.

Teachers' perspectives on children's knowledge and attitudes about safety and changes were obtained through pre- and post-intervention teacher interviews using open-ended questions (Krueger, 2007a, 2007b; Polgar & Thomas, 2008).

Procedure. Initial discussions with teachers explained the project and informed the researcher on the children's knowledge and perspectives about safety. To protect privacy, explanatory statements and consent forms were delivered and returned via the teachers.

Both intervention and comparison group parents received an explanation of the study's rationale, completed the SKSB Checklist and received a presentation of the intervention program. A training session on reinforcement of the program at home followed for intervention parents. The comparison preschool parents were to be offered the intervention materials and the preschool the program if the intervention program was found to be successful. Parents unable to attend information sessions were offered personal meeting times. The SRI Test was then administered by the researcher at each preschool and the cameras distributed. At a subsequent preschool visit, one-on-one interviews in groups of four were conducted engaging the children that received cameras. During the same visit, the intervention materials were distributed to the preschools. All materials were provided free of

charge. The four intervention preschools commenced the program in term one and concluded it in term four (Figure 5.1).

Post intervention, a total of 91 parents from both groups completed the SKSB Checklist and shared comments on their child's safety knowledge, skills and behaviour and noted any changes. Parents from the intervention group also reported on the effectiveness of the program and the experience of participating in the study. Following completion of the post-intervention SRI Test, the children from both groups participated in small focus groups, which included the sharing of photographs taken during the camera activity.

Results

SRI tests and SKSB checklists

Table 5.2 reports on the repeated measures ANOVA of two factors under consideration: (1) the within-subjects factor, which represents the pre- and post-SRI factor for all children from the intervention and comparison groups.

Table 5.2

Within-Subjects Child Pre- and Post-Test Results

Source	Pre Post	Type III Sum of Squares	df	Mean Square	F	Sig
Pre Post	Linear	1597.744	1	1597.744	757.311	.000
Pre Post*School	Linear	37.690	3	12.563	5.955	.001
Pre Post (Pre Post)	Linear	312.244	148	2.110		

The analysis of variance revealed that there was a significant statistical difference in pre- and post-scores for children $P \leq 0.01$. Mean pre- and post-SRI results for the intervention children are shown in Table 5.3.

Table 5.3

Within-Subjects Child Intervention Group Pre and Post-SRI Test Results by Preschool

School	Number Children	Pre (Mean)	Post (Mean)	Pre (STD)	Post (STD)	% Mean Difference
PreSM1	41	19.5	23.4	3.0	1.6	21.1%
PreSM2	49	18.7	23.1	4.0	2.1	24.7%
PreSM3	33	17.9	23.8	8.3	2.7	36.0%
PreSM4	29	16.9	21.3	2.5	3.0	27.6%
Average Total Scores	152	18.2	22.9	4.4	2.4	22.9%

Exposure to the intervention strategies led to an increase in post-intervention results. The pre-intervention average child score for the intervention group was 18.2 represented in the Pre (mean) column. The post-intervention average child score for the same group was 22.9 represented in the Post (mean) column. This represents an average increase of 22.9% from pre- to post-intervention scores. Table 5.4 represents the mean pre- and post-SRI scores for comparison preschool children.

Table 5.4

Within-Subjects Child Comparison Group Pre and Post-SRI Test Results by Preschool

School	Number Children	Pre (Mean)	Post (Mean)	Pre (STD)	Post (STD)	% Mean Difference
PreSM5	31	19.2	19.7	3.9	5.1	2.6%
PreSM6	52	19.3	19.8	3.8	5.2	2.6%
PreSM7	44	20.7	20.6	2.8	3.4	-0.5%
PreSM8	23	19.3	19.5	4.2	6.5	1.0%
Average Total Scores	150	19.6	19.9	3.7	5.0	1.5%

The pre-intervention average child score for the comparison group was 19.6 represented in the Pre (mean) column. The post-intervention average child score for the same group was 19.9 represented in the Post (mean) column. This represents an average increase of 1.5% from pre- to post-intervention scores. A representation of the child pre- and post-SKSB scores for the intervention and comparison groups are illustrated in Figure 5.2.

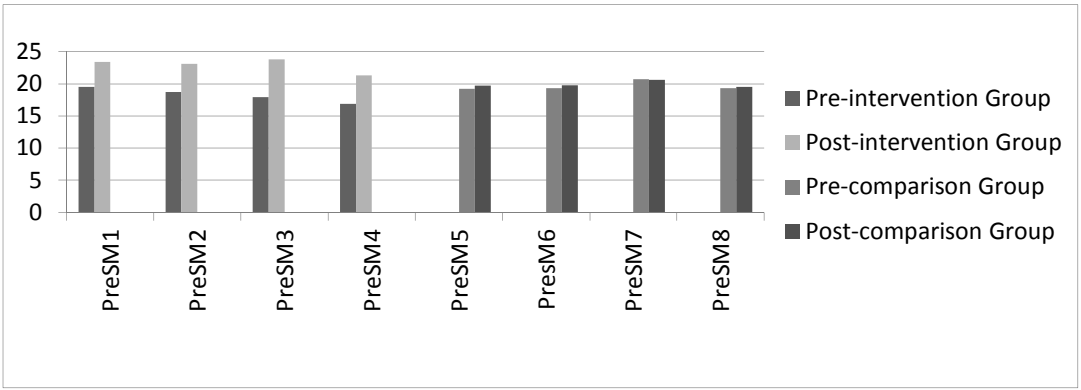


Figure 5.2. Intervention and comparison groups child pre- and post-SRI scores by preschool.

The results demonstrated children from the intervention preschools (PreSM1 to PreSM4) gained a greater post-intervention percentage increase score than the children from the comparison preschools (PreSM5 to PreSM8).

The parent pre- and post-SKSB scores were consistent with the child results as illustrated in Table 5.5, Table 5.6 and Figure 5.3.

Table 5.5

Parent Intervention Group, Pre- and Post-SRI Test Results

School	Number Children	Pre (Mean)	Post (Mean)	Pre (STD)	Post (STD)	% Mean Difference
PreSM1	28	96.6	106.5	4.8	6.2	9.7%
PreSM2	9	93.3	103.2	9.4	7.8	10.0%
PreSM3	6	88.8	103.5	8.1	3.4	15.9%
PreSM4	15	86.7	106.3	6.0	3.2	20.3%
Average Total Scores	58	91.4	104.9	7.1	5.2	13.8%

The pre-intervention average parent score for the intervention group was 91.4 represented in the Pre (mean) column. The post-intervention average parent score for the same group was 104.9 represented in the Post (mean) column, resulting in an average increase of 13.8% from pre- to post-intervention scores. The mean pre- and post-SRI scores for comparison preschool parents are represented in Table 5.6.

Table 5.6

Parent Comparison Group, Pre- and Post-SRI Test Results

School	Number Children	Pre (Mean)	Post (Mean)	Pre (STD)	Post (STD)	% Mean Difference
PreSM1	12	96.2	99.5	4.3	5.1	3.4%
PreSM2	9	90.3	92.3	6.7	7.5	2.1%
PreSM3	4	83.5	85.3	4.4	3.4	2.1%
PreSM4	8	93.0	96.4	8.7	10.0	3.6%
Average Total Scores	33	90.8	93.4	6.0	6.5	2.8%

The parent score for the comparison group pre-intervention is represented in the Pre (mean) column with an average of 90.8. For the same parent group post-intervention, the average score was 93.4 represented in the Post (mean) column. This represents an average increase of 2.8% from pre- to post-intervention scores.

A representation of the child pre- and post-SKSB scores for the intervention and comparison groups are illustrated in Figure 5.3.

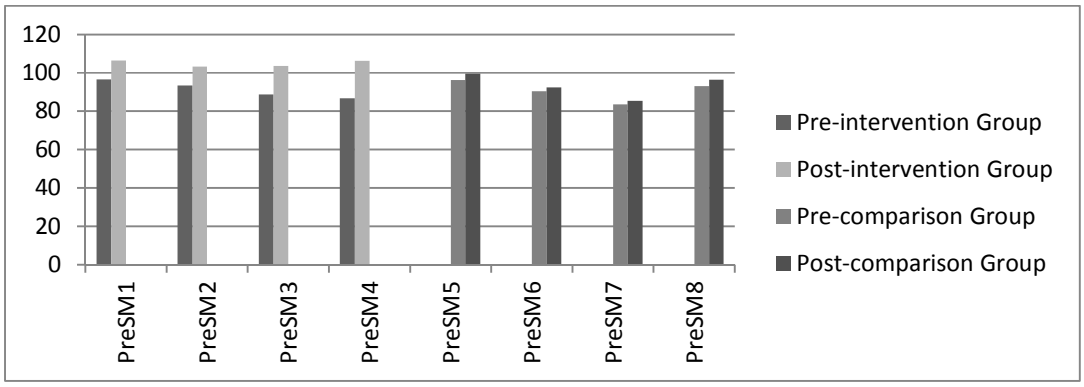


Figure 5.3. Intervention and comparison groups parent pre- and post-SKSB scores by preschool.

Figure 5.3 provides a visual representation of the higher post-intervention percentage increase scores recorded from intervention group children in contrast to the children's scores from the comparison preschools. As illustrated in figures 5.2 and 5.3, the children from the intervention preschools gained a higher post-intervention percentage increase score than the children from the comparison preschools suggesting that the hypothesis can be accepted.

The results demonstrated that the SeeMore Safety program was effective in changing children's safety perceptions and behaviours. Children gained greater safety awareness, knowledge and skills from the SeeMore Safety intervention program compared with, if any, other safety education programs that may have been delivered within the curriculums of the comparison preschools.

Focus groups, questionnaires and informal interviews

Focus groups, questionnaires and informal interviews revealed trends in changes of terminology, safety comprehension and perceived behaviour change.

Changes in terminology

During pre-intervention group discussions and interviews, 58 children in the intervention group and 48 in the comparison group used words such as "bad" or "naughty" in reference to unsafe behaviour. Post-intervention in similar circumstances, the intervention children replaced "bad" and "naughty" in 50 occurrences with "hurt", while only three children from the comparison group changed their terminology. For instance, in a pre-intervention transcript, one child said: "unsafe is very bad"; that same child post-intervention said: "you could hurt yourself if you are unsafe" (PreSM 1).

Comprehension

Intervention parent comments recorded on the questionnaire and transcripts taken during focus group sessions also indicated the children's comprehension level of the concept of safety. An example from the transcript of one parent post-intervention included: "She relays what she has learnt at kinder and picks us up if we do something that she has learnt that is unsafe from the books, like talking on the mobile phone" (PreSM 1).

In response to prompt question, "Do you believe your child has a better understanding of safe practices?", all 58 intervention group parents commented on their child demonstrating new safety-related learning that was gained from the intervention program. Two of the four comparison preschools engaged in other formal safety education programs during the testing period, which included "Thingle Toodle" and "Responsible Pet Handling". The comparison group teachers made reference to these programs presented in the children's discussions. For example: "They discuss Thingle Toodle and comment on road safety" (PreSM 5).

Behaviour Changes

Post-intervention teachers were asked if they had noticed any behaviour changes in the children towards safety, the way they play, interact, or comments they make. All intervention group teachers provided detailed experiences they had witnessed whilst supervising the children. For example: “In the playground, Zoe and Ned were role-playing going on a holiday. Getting into their “car”, Zoe informed Ned that he had to put on his “seatbelt” to keep safe. Ned put on the imaginary seatbelt” (PreSM 4).

Teachers also referred to comments parents had made in relation to changes they had made in their own safety practices. For instance: “The children being able to share their books with families has been a wonderful experience because the parents have become more conscious about their own safety behaviours” (PreSM 3), and parents also mentioned things like: “We no longer drive and talk on the mobile phone in the car” (PreSM 4).

Comments from the intervention group parents complemented those of the teachers. For instance: “Not only has my son changed his behaviour, but our family is more safety conscious” (PreSM 1).

The safety message and behaviour change was further reinforced by some of the children’s comments. For instance: “My Dad talks on the mobile phone and I tell him, no, you don't talk on the phone when you are driving; that’s what ‘SeeMore’ says” (PreSM 1).

Wearing seatbelts, behaviour when travelling in the car and parents talking on mobile phones were common safety topics discussed by the children.

Discussion

Qualitative data analysis supported that of the quantitative data where a greater safety understanding was noted in children of the intervention group when compared with the understanding of the comparison group children.

Post-intervention, the depth and significance of the children’s new learning and comprehension of safety was revealed through their demonstration of a shift in terminology and a broader understanding of safety-related terms that were explained to them in the focus group and interview sessions. The concept of combining real-life experiences to support the themes within the program resources may have contributed to this, as the children were able to articulate their actions. For example: “I put my seatbelt on all by myself, like ‘SeeMore’ says” (PreSM3).

Parents also reported being active in reinforcing the safety messages the children were being exposed to in the program through animation in their everyday activities. For instance: “Looks both ways before crossing the road, even though she is holding my hand” (PreSM3).

In this example, the relationship between imagination and reality is conceptualised. Fleer (2011a) suggests that connecting imagination and cognition in children’s play-based programs can support teachers in a conceptual play-based theoretical framework.

There was a common trend of two important concepts that emerged from the analysed data; first, children having agency in the conceptualisation of safety; and second, the impact this new knowledge had on changing their safety behaviours – and that of their parents as well, in some cases. For example: “He puts on his seatbelt by himself and very proud of it; tells us he is a big boy now” (PreSM 2).

The child has conceptualised the wearing of a seatbelt as a safety requirement for when travelling in the car, and is initiating his own actions. The child is central to the new safety-learning process, where the concept of “self” matters. According to Stetsenko and Arievitch (2004a), self is “shaped by social factors such as interactive experiences with significant others and group membership, along with the roles and positions each individual occupies in society” (p. 477).

In this example, it is the child’s interaction with the teacher and parents, along with the respective roles and positions each played within the learning process, that signified the child’s capability to self-regulate. This was demonstrated by the child acting in a manner that revealed positive safety behaviour in his everyday activity. While specific components of the intervention program were not evaluated separately, it is possible that placing children in a position of authority through their photographs being inserted into the books, as lead characters in the safety-related stories, may have contributed to them having agency. Mobile phone use was another commonly referenced topic where children influenced the actions of their parents: “Behaviour in the car has improved and we are not allowed to answer the phone in the car” (PreSM 1).

A collaborative form of shared-learning play-based programs, where teachers, children and parents are included in the education process, can positively influence children’s learning in later school years (Siraj-Blatchford, 2007), suggesting safety in preschools is important.

Whilst adults are considered role models for their children through safe behaviours, the study suggests that children can influence safe behaviours in their parents and siblings. The shared-

learning approach provided a strategy to inform children and their parents on positive and best practice safety behaviours. This was supported by findings of the American National Fire Protection Association program, "Learn Not to Burn". Parents reported knowledge transfer, with their children influencing safe practices in the home post-intervention (Johnson, 2007).

In the past it has been difficult to measure the real effectiveness of safety education programs for young children in reducing childhood injury due to the inconsistent reporting methods used by researchers. However, an injury prevention project called "PRECISE" (Prevention of Child Injury through Social-intervention and Education) engaged a large cohort of children in rural Bangladesh to trial the effectiveness of the "SwimSafe" program to address the alarming statistics of drowning in this country. At the time, drowning was among the leading reasons for childhood deaths in Bangladesh, accounting for 17,000 children dying each year (SwimSafe, 2015). Following the intervention over a three-year period, where 28,000 children were trained in the SwimSafe program, there were no recorded deaths or serious injuries during that time (SwimSafe, 2015). This suggests that if safety initiatives with proven cost-effective measures for preventing injuries were implemented, positive outcomes could be achieved.

Limitations. Unlike the Bangladeshi study, which had a much larger cohort, this study was limited by a sample size that was too small to enable a breakdown by injury mechanism, such as falls, road traffic injury and poisoning. A larger sample size would be desirable for future studies.

With large-scale studies like the Bangladeshi example, evidence of reductions in injury rates would support widespread implementation of safety initiatives, particularly if such an intervention, or its components, could be shown to be cost effective. The study was also limited by the short intervention and follow-up periods. Larger and more sustained intervention trials, similar to the current study, could be conducted to determine the effect, if any, on injury rates that is attributable to the intervention.

Conclusion

The findings of this study suggest educational injury prevention programs can influence the development of children's safety knowledge and behaviour. The SeeMore Safety program uses a cognitive model for children to develop knowledge, skills, attitudes and self-understanding required for making their own decisions about safety risk management. This study demonstrates successful application of such a model in a preschool setting, at least in the short term.

Based on children's knowledge gains in the perceptions of safe and unsafe terms, it can be concluded that the intervention provided an opportunity for broadening children's understanding and conceptualisation of safety-related risks. Information generated from the study on how children perceive and conceptualise risk indicated that some intervention children believed themselves to have responsibilities in minimising injury risks and educating others on safe practices. The intervention group also manifested instances of corresponding change in the children's and parents' safety behaviours.

The difference in the results of the intervention group when compared to the comparison group indicates that safety conceptualisation is more than a maturation developmental process. The findings support that the learning of safety was advanced through participation in the intervention program.

References

Cody, B., Mickalide, A., Paul, H., & Colella, J. (2002). *Child passengers at risk in America: A national study of restraint use*. Washington, DC: National SAFE KIDS Campaign.

Cody, B., Quraishi, A., Dastur, M., & Mickalide, A. (2004). *Clear danger: A national study of childhood drowning and related attitudes and behaviors*. Washington, DC: National SAFE KIDS Campaign.

Fleer, M. (2011a). Conceptual play: Foregrounding imagination and cognition during concept formation in early years education. *Contemporary Issues in Early Childhood, 12*(3), 224–237. Retrieved from http://www.wwwords.co.uk/CIEC

Gay, L., Mills, G., & Airasian, P. (2009). *Education research competencies for analysis and applications*. Upper Saddle River, NJ: Pearson Education.

Heck, A., Collins, J., & Peterson, L. (2001). Decreasing children's risk taking on the playground. *Journal of Applied Behavior Analysis, 34*(3), 349–352.

Johnson, W. (2007). *Safety Education: Do kids know more than parents?* Shaker Heights Fire Department, Shaker Heights, Ohio, USA.

Krueger, R. (2007a). *Interviewing. University of Minnesota, Minnesota*. Retrieved from http://www.tc.umn.edu/~rkrueger/evaluation_interviewing.html

Krueger, R. (2007b). *Tips for designing a survey questionnaire. University of Minnesota, Minnesota*. Retrieved from http://www.tc.umn.edu/~rkrueger/evaluation_tfdasq.html

Krueger, R., & Casey, M. (2000). *Focus groups: A practical guide for applied research* (3rd ed.). Thousand Oaks, CA: Sage Publications.

Loescher, L., Emerson, J., Taylor, A., Hendrickson-Christensen, D., & McKinney, M. (1995). Educating preschoolers about sun safety. *American Journal of Public Health, 85*(7), 939–943.

National Public Health Partnership (NPHP). (2004). *The national injury prevention and safety promotion plan: 2004–2014*. Canberra, ACT: Author.

O'Neill, S., Fleer, M., Agbenyega, J., Ozanne-Smith, J., & Urlichs, M. (2013). A cultural-historical construction of safety education programs for preschool children: Findings from SeeMore Safety, the pilot study. *Australasian Journal of Early Childhood, 38*(2), 74–84.

Polgar, S., & Thomas, S. (2008). *Introduction to research in the health sciences* (5th ed.). Edinburgh, Scotland: Churchill Livingstone Elsevier.

Ryan, J. (2005). *Learning to be safe: Developing children's perceptions of safety and risk*. Australian Research Council Grant Application. Melbourne, Vic.

Safe Kids USA. (2009). *Raising safe kids one stage at a time: A study of child development and unintentional injury*. Washington, DC, USA. Retrieved from http://www.usa.safekids.org

Siraj-Blatchford, I. (2007). Creativity, communication and collaboration: The identification of pedagogic progression in sustained shared thinking. *Asia-Pacific Journal of Research in Early Childhood Education, 1*(2), 3–23.

Speltz, M., Gonzales, N., Sulzbacher, S., & Quan, L. (1990). Assessment of injury risk in young children: A preliminary study of the injury behaviour checklist. *Journal of Pediatric Psychology, 15*(3), 373–383.

SPSS for Windows Version 17, 2008. Chicago. SPSS Inc.

Stetsenko, A., & Arievitch, M. (2004a). The self in cultural-historical activity theory: Reclaiming the unity of social and individual dimensions of human development. *Theory & Psychology, 14*(4), 475–503.

SwimSafe. (2015). *Preventing child drowning in Asia through teaching survival swimming skills*. Retrieved from http://swimsafe.org/swimsafe-projects/bangladesh/

VicRoads. (2011). *Traffic safety education: Directions and action plan 2008–2010 Victoria*. Retrieved from http://www.arrivealive.vic.gov.au

World Health Organization (WHO) and UNICEF (2008). Peden, M., Oyegbite, K., Ozanne-Smith, J., Hyder, A., Branche, C., Rahman, F., Rivara, F., & Bartolomeos, K. (Eds.). *World report on child injury prevention*. Geneva, Switzerland: WHO Press.

SCHOOL CODES:

Main Study Preschool 1 = PreSM 1

Main Study Preschool 2 = PreSM 2

Main Study Preschool 3 = PreSM 3

Main Study Preschool 4 = PreSM 4

Main Study Preschool 5 = PreSM 5

Main Study Preschool 6 = PreSM 6

Main Study Preschool 7 = PreSM 7

Main Study Preschool 8 = PreSM 8

Chapter 6

A Child's Voice on Safety: Empowering Children to Influence Positive Safety Behaviour in Themselves and Others

Susie O'Neill

Preface – Linkage of Papers Three and Four (chapters 6 and 7)

In the previous two papers, the findings of the pilot study and the main study were reported. In papers three and four, the qualitative findings of the pilot and main studies are detailed. These papers collectively bring together the concept of shared learning where children are central to the safety-learning process.

The concept of children actively engaging in the new learning process and being responsible for transforming family practices and understandings about safety is reported in papers three and four. Both papers are currently under review.

Paper Three: *A Child's Voice on Safety – Empowering Children to Influence Positive Safety Behaviour in Themselves and Others*

This paper presents the findings of the qualitative data of the pilot and main studies, where children participated in intervention programs using the SeeMore Safety program.

The comparison preschools that participated in the main study were not considered in this paper because the qualitative material related specifically to the "SeeMore Safety" intervention program and the effect it had on family safety practices and behaviour.

Revealed in the study findings was the key concept of the position children attain in relation to their material and social worlds when analysing risk situations. Importantly, it was found children can play a major role in influencing the safe behaviours of others. Providing children with experiences that encouraged a sense of ownership of the safety issues was found to have benefits that transformed family practices. This form of safety-related capacity building contributes to the notion that children are powerful educators.

The pilot and main studies brought attention to positive safety-related behaviour changes occurring at various levels of participation, where parents were responsive to their children having agency in the safety education process. The findings from the paper led to the development of a model to illustrate how children can have a positive influence on changing the safety behaviour of others.

Paper Four: *Safety Risk Assessment Model – Concept Formation of Safety and Risk*

This paper introduces the *safety risk assessment model*, which details the way that safety and risk is conceptualised within a shared-learning environment. The model is used to illustrate the child–adult relationship associated with conceptualising safety through their interactive process.

Abstract

The child injury prevention field has progressed rapidly in recent years with corresponding reductions in child injuries in many countries. While early childhood education has an important role to play in injury prevention, this has not yet reached its full potential. The qualitative component of a pilot study and a main study investigated 350 preschool children's understandings of safe and injury risk situations. The main study examined safety knowledge and comprehension gained through participating in an early-learning injury prevention program and explored how children transformed their behaviours in relation to potential hazards in their environment.

The findings of this study showed that children play an important role in influencing safe behaviours, not only in themselves but also in their parents, thereby dispelling the notion that it is only adults who act as role models for their children's safe behaviours. In this context, children are not passive recipients but rather active agents who can transform family practices and understandings about safety.

Key words: Behaviour, children, early childhood, preschool, risk, safety

Introduction

Injuries are a major public health challenge and are among the leading causes of childhood death and disability worldwide (WHO, 2008). The global childhood injury problem has prompted health and educational professionals to explore the role of educational approaches in developing strategies to reduce death and disability in children arising from unsafe practices.

Whilst the concept of child empowerment in injury prevention-based strategies appears to be underexplored, it could prove to be important in changing safety-related behaviours through the delivery of safety education programs that empower children to act with safety reasoning. Investing early in childhood safety education programs through an integrated approach that recognises the importance of building strong partnerships with parents and families could provide a foundation for children to contribute to their own safety and that of others.

Internationally, there is a widespread view that early childhood education contributes to lifelong learning most effectively when there are partnerships between children, parents, and teachers. These partnerships enhance continuity in children's learning (Victorian Curriculum and Assessment Authority, 2008). Principles underpinning curriculums worldwide recognise families as important educators of their children (Fleer & Williams-Kennedy, 2002; Victorian Curriculum and Assessment Authority, 2008), and therefore families should be supported through a range of early childhood services including those associated with promoting safety. There is the potential to achieve this through shared-learning programs incorporated into the preschool curriculum. Injury prevention programs delivered in the preschool, which are then reinforced in the home, provide consistency in the safety messages and transfer of knowledge from the child to their parents and siblings. Such an approach may provide the opportunity to empower learners in the early years when lifelong learning skills are acquired.

Studies (Quaraishi, Mickalide, & Cody, 2005) suggest adults influence their children's safe behaviours; however, in this paper it will be shown that children play an important role in influencing safe behaviours in their parents. The study detailed in this paper sought to determine if it is possible for children who participate in an injury prevention program delivered through their preschool could develop safety and risk understanding. What became evident was that not only could the children develop their own understanding of safety and risk but they were also able to transfer that safety knowledge and understanding to their parents and siblings.

This paper draws upon a cultural-historical approach to argue for a complementary theorising to the multi-faceted approaches which currently dominate the education field. The first part of the paper discusses this theoretical orientation followed by the study design and the findings. The final section concludes that children with agency can positively influence the safety behaviour of adults in their respective families.

In this paper, the terms "preschool" and "preschool child" are frequently used. The term "preschool" in the context of this paper refers to a kindergarten or early learning centre, and the term "preschool child" refers to a child attending a kindergarten or early learning centre who is generally between three and six years of age.

Cultural-Historical Framing of a Safety-Related Learning Program

In contrast to maturational theories, the study reported in this paper draws upon a cultural-historical view of development and argues that it is the child's relationship to the material and social worlds, rather than an emphasis on age, that should be analysed and referenced in debate on safety.

A thorough discussion of the theories and research which guide the development of shared-learning programs is beyond the scope of this paper. However, a brief discussion of the cultural-historical theoretical basis is presented because, as it will be argued in this section, it is supportive of the ways in which children acquire knowledge and understanding in relation to managing safety-related risks through shared-learning programs.

Theoretical perspectives that encourage learning through interaction with others are considered essential in understanding the learning process (Elkonin, 1972; Karpov, 2003; Leontiev, 1964; Vygotsky, 1929; Zaporozhets, 1997). These theoretical perspectives position the learner at the centre of the process and recognise that if meaningful learning is to take place, individual perspectives need to be considered, valued and used to create the conditions for context-specific mediation. By taking a cultural-historical view of child development, the child is considered to have agency within the learning process, transforming practices and reasoning about their own safety. However, no studies were found which drew upon cultural-historical theory for the design and implementation of safety risk programs.

Vygotsky's (1929) theory of child development, which foregrounds the internalisation of social relationships where children's learning is supported by others, appears to align with more recent principles underpinning the curriculum in Australia and other parts of the world (Victorian

Curriculum and Assessment Authority, 2008). Russia (Kravtsov & Kravtsova, 2009), the United States (Bodrova & Leong, 2007) and the Netherlands (Davydov, 2008; van Oers, 2009) have adopted cultural-historical theories for framing early childhood education. According to Fleer (2011b), this indicates a global change in curriculum direction and development for some countries. Fleer (2011b) states:

> as curriculum moves beyond dichotomous understandings of the early childhood curriculum as either social pedagogic or "pre-primary" in orientation (even when elaborated as a continuum) (OECD, 2006), it is timely to reflect on the extent to which existing ways of framing curriculum mirror how we have conceptualised children, childhood and children's experiences of contemporary everyday life (p. 4)

Cultural-historical theory forms one of a suite of theories that are advocated in the 2009-released national Early Years Learning Framework in Australia, known as "Being, Belonging and Becoming" (Department of Education, Employment and Workplace Relations, 2009). In the framework, emphasis is placed on the importance of social context and acknowledgment of the role of culture in learning and development. A shift towards early childhood curriculums, which are underpinned by cultural-historical theory, is believed to be imperative if educators are to provide a fair and rounded learning experience that challenges all children's level of ability and development (Fleer, 2010, 2011a, 2011b; Fleer & Hedegaard, 2008; Fleer, Hedegaard, & Tudge, 2009; Hedegaard, 2009).

The socio-cultural nature of learning in preschool settings involves both children and teachers working together as they co-construct meaning, a process which requires a higher order of thinking (Anning et al., 2004; Vygotsky, 1929). This is particularly important in injury prevention programs, where concepts of safety-related understandings, capabilities and dispositions are paramount in the development of the learners' risk management skills.

Vygotsky's cultural-historical theory recognises the significance of the social context of the learner as a shared-learning process where there is an "understanding between minds" (1962, p. 6). He argued that the more knowledgeable person in a shared-learning process can lift the learner into a zone of proximal development (1962), where the relationship between the adult and the child works at a higher level than the child's actual level of development. According to Chaiklin (2003), the zone of proximal development is the intellectual actions and mental functions that a child uses in interaction with others during which the child is psychologically aware and engaged.

Kravtsova (2008) provides insight into the range of adult mediation that brings to the fore the positioning of the adult in relation to the child. For instance, an adult can be "above" the child when they are the knowledgeable expert. However, the child and the adult can also take "equal" positions where they collaboratively co-construct learning. Similarly, the adult can be "below" the child when the child has more knowledge and can influence adult or family behaviour in relation to risk situations.

The positioning of the child in this theorisation allows for both agency and behavioural change that goes beyond the preschool setting in terms of safety, as children draw upon new-found knowledge and understanding to make decisions about situations that present themselves in everyday life. Through this process, the learner is supported in his or her development to reach new levels of understanding. In the co-construction of meaning (Jordan, 2004), the child is given agency in his or her own learning (Anning et al., 2004), which enables the child to take a more active role in navigating between their social and material environments beyond the early childhood centre.

According to Bodrova and Leong (2007), one of the strengths of the Vygotskian approach to early childhood education is the emphasis placed on self-regulation, an underlying principle that is important in child development. Bodrova and Leong (2007) quote: "at the end of kindergarten, young children should be capable of self-regulation – the ability to act in a deliberate, planned manner in governing much of their own behaviour" (p. 127).

Acting in a deliberate manner requires the child to be able to regulate his or her physical and emotional behaviours as well as the cognitive behaviours. This connection between the child's intentions and subsequent behaviour underpins safety risk management. It is a truly self-regulated child who thinks first and acts later (Bodrova & Leong, 2007). The child assesses the level of risk and then acts according to the child's understanding of his or her own capabilities built from prior experiences, knowledge and self-awareness. In this context, the child's role in the conceptualisation of safety and risk matters. According to Vygotsky (1987), children acquire mental tools which help to master behaviour:

> Internalised tools that extend mental abilities, helping us to remember, attend and solve problems. Mental tools are different in each culture and are taught to succeeding generations. They help the child master his own behaviour. Examples are language and mediators (Bodrova & Leong, 2007, p. 211).

Bodrova and Leong (2007) suggest the highest level of development is linked to one's "ability to perform and self-regulate complex cognitive operations" (p. 18). This level of development relies on the provision of mental tools which are used for higher mental functions, deliberate, mediated and internalised behaviours, that are acquired through learning and teaching (Bodrova & Leong, 2007). Managing safety-related risks requires individuals to use high mental functions, where informed decisions are made in response to situations that pose a risk of injury.

As discussed earlier, preschool years see a change in the relationship between a child's intentions and actions, which is timely and provides the context for safety-related learning. The social environment of the preschool can further extend opportunities for safety-related shared-learning programs that engage children, parents and teachers collectively. Program implementation is likely to be more effective if supported by parents who are included in the program structure.

A Place for Safety-Related Shared-Learning Programs in Preschools as an Injury Prevention Strategy

Where early childhood education strategies and home practices are aligned, it is possible to address the gap that is often exposed between what children learn at preschool and what is practised at home (Johnson, 2007). This is particularly important in relation to safety, as adults within the social milieu are key factors affecting provision and reception of messages from children. The role of social and cultural variables in explaining the adoption of new safe behaviours is further emphasised through this process.

A shift from pure psychological perspectives of behaviour change to more socio-psychological perspectives and an increasing emphasis on the cultural-historical influences on safety-related behaviour change in children is conceptualised. This new perspective foregrounds the relationship between cultural attitude, knowledge and safety-related behaviour and introduces the notion of intention of parents to act, how to act, or not to act when modelling appropriate safety behaviours for children. Identifying influential factors affecting intentions thus becomes an imperative. The focus, in this context, is on a number of critical factors affecting behavioural change of parents, including their perception of the safety risk of a specified environment, which will determine how they will behave. It suggests that theories of behavioural change are effective when conceptualised within a socio-cultural system, which involves reciprocal influence between children and adults.

Building strong partnerships with parents and families within early childhood education settings enhance the ability for learning to be more effective as parents act as role models for their children

(Victorian Curriculum and Assessment Authority, 2008). Recent studies have provided evidence and understanding to support the theory that adults are role models for their children when it comes to safety behaviours. However, children imitate both positive and negative safety behaviours demonstrated by their parents (Quaraishi et al., 2005).

Many factors play important roles in influencing safe behaviours, although, fundamentally, it may be the intentional act of the person that changes the behaviour in the end. An approach that can be applied to change the behaviour of one person and those whose behaviour strongly influences others, such as parents and teachers, may prove to be effective if individuals' differences, their abilities and their readiness to change a behaviour are considered. Such an understanding provides for flexibility in planning strategies for childhood injury prevention that take into consideration the complexities of the many different social situations of cultural communities.

The following section of the paper draws upon the findings of a preschool study that engaged children, their parents and teachers in a shared-learning safety intervention program.

The Study

The study sought to examine if safety education programs designed for preschool children can provide a foundation for children to develop an integrated understanding of safety and injury risk. Questioned in the study was children's ability to recognise, analyse and respond to injury risk situations; and whether safety conceptualisation can be developed to enhance children's ability to manage decisions about their own safety and potentially that of others. Whilst the assumptions tested collectively in the pilot and main studies covered broader subject matter, the focus of this paper is confined to the findings based on the qualitative data that related to changes in safety perceptions and behaviours of children and their families. Ethics approval was received from the governing institution committee.

Seven preschools located in the Geelong district were involved in a pilot study and four preschools located in the Ballarat region were involved in the main study over a period of five to six months. Both locations are in the state of Victoria, Australia. The total number of participants included 350 children, 205 parents and 11 teachers from the 11 intervention preschools.

The City of Greater Geelong (CoGG) preschools were recruited via an emailed invitation to all preschools in the Geelong area listed on their family services database. The four Ballarat preschools were selected via a stratified random-cluster sampling process. Of the 350 children who participated

in the pre-intervention and post-intervention focus groups and interviews, 198 were from the pilot study and the remaining 152 from the main study. The number of children in each preschool group varied between 9 and 58 and were between three and six years of age (refer Table 6.1).

Table 6.1

Pre- and Post-Test Child Participants

Preschool	Number of children pre- and post-test	Age
PreSP1	9	4.0 to 5.5 years
PreSP2	35	4.0 to 5.0 years
PreSP3	14	4.0 to 5.0 years
PreSP4	58	4.0 to 5.0 years
PreSP5	27	4.0 to 5.0 years
PreSP6	39	4.0 to 5.5 years
PreSP7	16	3.0 to 4.5 years
PreSM1	41	4.0 to 6.0 years
PreSM2	49	4.0 to 5.0 years
PreSM3	33	4.0 to 5.5 years
PreSM4	29	3.0 to 4.5 years
Total	350	3.0 to 6.0 years

Intervention: The SeeMore Safety program. The intervention program used in the pilot and main studies, named SeeMore Safety, was developed by the author as a tool to cover safety and risk relevant to Australian children. SeeMore Safety is a preschool shared-learning intervention program that reinforces the important role teachers and parents play in teaching children safe behaviours through combining a home-support approach to programs delivered in preschools. This intervention was used because no other broad-based safety education program of this kind could be found. SeeMore Safety is focused around learning through literature and real-life experiences. The program is initiated in the preschool through themed large-picture books and then via smaller corresponding take-home books children own and share with their parents and siblings.

Each preschool was provided with a resource kit, which included:

- a teachers' guide
- a class set of (A4) children's picture books
- a set of (A5) children's picture books for each child in the group
- games
- activity sheets
- CD
- posters.

Figure 6.1. SeeMore Safety intervention program.

Method. The pilot study was conducted by the City of Greater Geelong (CoGG), Victoria, Australia through its SafeStart program. Coordinators implemented the program independently but in consultation with the author to limit any potential bias. This was important, as in addition to addressing the research questions, the pilot study aimed to inform the sample size for the main study as well as determine the suitability of the program content for preschool children and the reliability of testing instruments (Author, 2013). The main study was carried out by the author in the following year (2009) based on findings from the pilot study.

Data was collected from three sources: children, parents and teachers via pre- and post-intervention focus group discussions, questionnaires and interviews. This data provided information about how children perceived safe and unsafe situations and gauged any changes in their knowledge and attitudes towards safety and related behaviour as a result of participating in the safety education program.

Whilst the SeeMore Safety program was designed as a year-long program, it has the flexibility to cater for individual preschool needs and can be condensed into shorter time frames. For the Geelong-based pilot study, the intervention period commenced in term two, 2008, and concluded in December 2008. The main study conducted in the Ballarat region commenced the following year towards the end of term one and concluded in December 2009.

The SeeMore Safety program was introduced to parents in the participating preschools via an information session arranged by the teachers. At the information session, parents were provided with an overview of the program, consent forms and a questionnaire they were asked to complete regarding their children's safety-related behaviours. In the following weeks, facilitators visited each preschool group to collect the pre-intervention data through interviews with the teachers and via focus group discussions and interviews with the children. Following the data collection procedures, the resources were distributed to the preschools free of charge.

Post-intervention, repeat methods were used to collect qualitative data from the children, parents and teachers. At completion of the intervention program, only children who were present at pre- and post-intervention group sessions were included in the data findings – 147 pilot study and 91 main study children in total. Post-intervention, parents shared their comments via the questionnaires and focus group discussions on the effectiveness of the program, if any, and noted any changes in their child's safety knowledge, skills and behaviours. The teachers provided information about the children's new learning and behaviour they observed at preschool via interviews recorded by the CoGG coordinators, researcher and scriber.

Findings.

Safety and Play

The teachers reported on observations they had made during children's playtime at preschool related to changes in safety behaviours and comprehension following the intervention. For example: "During play, the children made a crossing in the playground, and that was the only safe place to get back and forward" (Chris, PreSM 3).

In this instance, safety-related conceptual development is evident in the children's play-based activities. The children have included their new learning into imaginary situations where their role-playing portrays very realistic thinking. Understanding of the relationship between imagination and reality in children's play during their early years is conceptualised in the work of Fleer (2011a).

Fleer (2011a) argues that "conceptual play as a theoretical framework can support teachers in bringing together imagination and cognition in their play-based programs" (p. 236).

Such an approach could be highly effective in safety intervention programs where there is an underlying learning concept of transitioning from role-playing into real situations. From the earlier example where the teacher reported on the children creating a safe crossing in the playground, she expanded their learning by taking the children on an experience outside the preschool. This teacher took the children to a nearby school crossing with lights, managed by a "lollipop lady" (school-crossing supervisor). In this scenario, the children were exposed to the real-life situation of using a school crossing (Carly, PreSP 3).

Figure 6.2. Practising safety-related learning in a real-life situation.

Figure 6.2 demonstrates this situation where the children are guided safely across the road. The crossing was initially played out in the children's imaginative play, which has now connected with reality.

According to Fleer (2011a):

> conceptual play illustrates the dialectical nature of imagination and cognition (doubled experience), and shows that they must act in unity. The generation of an imaginary situation by the teacher or the child is an important conscious act where children can rise above reality, descend to reality, connect with reality and play with reality. Through the unity of imagination and cognition, the bridge between play as the leading activity is extended to learning as the leading activity for the child (p. 234).

All preschools engaged the children in special activities related to the themes being introduced in the SeeMore Safety books, either by taking them on excursions or having visits from safety organisations.

Figure 6.3. Role playing during an excursion.

On excursions, the children engaged in role-playing activities whilst being introduced to safety equipment and practices. To support the bike safety booklet and activities, preschools participating in the pilot study were provided with bikes and helmets for the children to practise their riding and safety-related skills.

Figure 6.4. Demonstrating bike safety skills.

Children's comments recorded by the program coordinators suggested that they have been able to conceptualise the helmet as a safety item connected to riding a bike. For example: "I wear my helmet on my bike; that's safe" (Allah, PreSM 4).

Not only do the statements unify the helmet and the bike in the children's minds, but also the notion of rules begin to appear in their comments. Another example: "Ya gotta put a helmet on when ya ride a bike" (George, PreSM 4).

The intervention program learning process reveals the connection between imagination and cognition, where the children in this shared-learning approach interact with their teachers on varying cognitive levels. Whilst these examples highlight bringing together imagination and cognition, they also give rise to Vygotsky's (1929) concept of the zone of proximal development explained in the previous section.

Safety-related shared learning

Research has shown that early childhood play-based programs, where *shared sustained thinking* occurs between children and teachers, impact greatly upon children's achievement in later school learning (Siraj-Blatchford, 2007), suggesting that extended and shared discussions about safety in preschools matter. The concept of shared sustained thinking can be broadened from children and teachers to other children, parents and siblings engaged in a collaborative form of shared learning. Examples that illustrated positive shared-learning outcomes were found in comments provided by parents. For instance: "Since participating in the program, my daughter climbs into her booster seat and buckles up without prompting, and often comments on the fact that you have to put seatbelts on in the car" (Alison, PreSP 2).

Not only has the child conceptualised the wearing of a seatbelt as a safety-given in the car, but she has also established a rule, where travelling in the car requires wearing a seatbelt.

Another commonly referenced topic in the data recorded from parents and children concerning the car safety theme was related to mobile phones. For instance: "When we are travelling in the car, she points out drivers on mobile phones and tells us that it is not safe, that drivers are not allowed to talk on mobile phones" (Sally, PreSP 6).

Whereas the seatbelt was understood to be the safety requirement in the car in previous examples, the child in this example connects the mobile phone within the car as the unsafe object, again building the rule notion. The psychological significance of this form of safety conceptualisation positions the child as powerful in their own learning and potentially that of others.

Two very important trends have emerged within the analysed data: children sharing their new knowledge with others; and changed safety-related behaviours of children and, in some cases, their parents. The knowledge-sharing concept appears on several levels, the first being child to child. For example: "Lucy was explaining to Chloe that the bike she was selecting was too big for her and she should go on the smaller one so she didn't fall off" (Angela, PreSP 1).

In this case, Lucy was conscious of the bike being too big for Chloe, a safety message that she had seen in the SeeMore Safety books and during the bike demonstration. She was able to comprehend the new learning and apply it to this situation, sharing the knowledge with a friend. This also demonstrates knowledge of body–object relationship in that the child was not just conscious of the risk posed by the bike, but the risk posed by the bike in relation to the child's body size. In the following comment, the parent expressed the enthusiasm that her child displayed in sharing this safety knowledge:

> Sharing the experience with other children makes the message the "norm". For example, all children must wear a helmet, and everyone must approach dogs with care. Our son has come home to teach us what he has learnt. He has been very receptive to the program. Able to verbalise the safe behaviours and reasoning behind the messages, he knows what happens when you don't practise being safe (Tanya, PreSP 1).

The take-home books stimulated discussion at home and enabled the children to share their new learning and transfer knowledge to other family members.

Changing safety behaviours

Central to the research findings was the effectiveness of the shared-learning approach, where the new learning gained in the preschool setting reached other important household members. This was evident in teachers' comments on safety behaviour changes that had occurred after the intervention program. For example:

> We have twins that were walked to preschool by their grandmother on a leash; they are now no longer needing to be restrained. The grandmother was so grateful for the change in behaviour of her grandchildren because of Seemore Safety. Another parent, who normally travels by taxi, was discussing how much easier it is for her to catch the taxi with her children because they were getting into the taxi more responsibly and putting on the seatbelt without being asked (Debra, PreSP 4).

The children demonstrated their capabilities of self-regulation, acting in a manner that demonstrated positive safety behaviour in their daily routines. The parents were benefiting from the behaviour change and there appeared to be an increased level of trust in their children's ability to practise their new safety-related learning in everyday activities.

Whilst there were noted changes in the children's safety-related behaviours, several teachers commented on changes in behaviour they observed in other family members. In the following example, the teacher discussed the significant change she had witnessed in a parent's safety practice:

> We had been concerned about a father who continued to ride a bike to preschool with his son as a passenger, with neither of them wearing helmets despite our attempts to get them to wear them. But now they are wearing helmets (PreSP 5).

Although the facilitator was unable to investigate the reason for the behaviour change, it appeared that the program may have played some role.

The teachers' reports on changes in safety-related behaviours of parents and other family members were limited due to the nature of the preschool environment and their participation within it. However, some parents did report on changes they had made to their home environment to improve safety or their safety practices as a family since participating in the program. Some examples are as follows: "Children's helmets are now stored where they can reach them" (PreSP 1). "We've talked about leaving the house without Mum or Dad. We talk about issues that arise on a daily basis; we

point out the safe way to do different things" (PreSP 1). "She can misbehave in the car, so the program has been handy in helping to deal with this issue, especially not distracting the driver" (PreSP 2). "We sat down together and did an evacuation plan" (PreSP 3).

These examples demonstrate that not only were there changes made to their home environments or practices to improve safety, but the subject was also a topic of discussion.

There was a common trend in statements provided by parents, indicating that family members other than the children participating had benefited from the program. For example: "He has come home from kinder and discussed in detail with his older and younger siblings safety with SeeMore" (PreSP 5).

Children's comments supported those of their parents, giving rise to the observation that they were active in implementing their own safe practices such as buckling harnesses/seatbelts in the car. They also reported on relevant safety messages they had passed onto their parents.

The parents' and teachers' comments acknowledged that the take-home books were powerful tools in motivating the children to share their knowledge with others. The children's photographs inserted into the books placed them in a position of authority, as they became a lead character in the story. This process is important because it gives the child agency where the concept of self matters. Stetsenko and Arievitch (2004a) explain: "Self as being profoundly shaped by social factors such as interactive experiences with significant others and group membership, along with the roles and positions each individual occupies in society"
(p. 477).

The current study provides evidence of the effectiveness of intervention on learning in early years and the children's ability to transfer safety knowledge to other important family members. This is supported by research undertaken in the United States to determine whether fire safety programs for elementary students changed fire safety behaviours of adults within the home through transfer of fire safety knowledge from the children (Johnson, 2007). Knowledge transfer was evident, with 73% of the 155 participating parents reporting that their children influenced safe practices in the home (Johnson, 2007). Whilst adults are considered role models for their children through safe behaviours, reports in this study suggest that children are powerful in influencing safe behaviours in their parents and siblings.

Conclusion

The intervention program demonstrated the effectiveness and opportunity for safety education programs to be included in early childhood curriculums. Collectively, the study findings demonstrated a pattern of knowledge transfer beyond the classroom. An outcome of the implementation of the intervention program was the conceptualisation of the "self" as an important agentive dimension within the shared safety-learning process. Giving a child a "voice" through safety education programs that empower the learner at a stage where lifelong learning is most effective has the potential to lay a foundation for tackling important aspects of the childhood injury problem. Opportunity exists for further studies to trial the effectiveness of safety-related shared-learning programs in preschool. In this study, the findings demonstrate that children have agency in transforming family practices and understandings about safety.

References

Anning, A., Cullen, J., & Fleer, M. (Eds.). (2004). *Early childhood education: Society and culture*. London, England: Sage Publications Ltd.

Bodrova, E., & Leong, D. (2007). *Tools of the mind: The Vygotskian approach to early childhood education*. Upper Saddle River, NJ: Pearson Education.

Chaiklin, S. (2003). The zone of proximal development in Vygotsky's analysis of learning and instruction. In A. Kozulin, B. Gindis, V. S Ageyev & S. M Miller (Eds.), *Vygotsky's educational theory and practice in cultural context* (pp 39–64). Cambridge, England: Cambridge University Press.

Davydov, V. V. (2008). *Problems of developmental instruction: A theoretical and experimental psychological study (international perspectives in non-classical psychology)*. New York, NY: Nova Science Publishers.

Department of Education, Employment and Workplace Relations. (2009). *Belonging, Being and Becoming – The Early Years Learning Framework for Australia*. Retrieved from http://www.deewr.gov.au/earlychildhood/policy_agenda/quality/pages/earlyyearslearningframework.aspx

Elkonin, D. (1972). Toward the problem of stage in mental development of the child. *Soviet Psychology, 10*(3), 225–251. (Original work published in 1971.)

Fleer, M. (2010). *Early learning and development: Cultural historical concepts in play*. New York, NY: Cambridge University Press.

Fleer, M. (2011a). Conceptual play: Foregrounding imagination and cognition during concept formation in early years education. *Contemporary Issues in Early Childhood, 12*(3), 224–237.

Fleer, M. (2011b). Technologically constructed childhoods: Moving beyond a reproductive to a productive and critical view of curriculum development. *Australasian Journal of Early Childhood, 36*(1), 16–24.

Fleer, M., & Hedegaard, M. (2010). Children's development as participation in everyday practices across different institutions. *Mind, Culture, and Activity, 17*(2), 149–168.

Fleer, M., Hedegaard, M., & Tudge, J. (2009). (Eds.). *Constructing childhood: Global-local policies and practices*. *World Year Book Series*. New York, NY: Routledge.

Fleer, M., & Williams-Kennedy, D. (2002). *Building bridges: Research literacy development for young indigenous children*. Canberra, ACT: Australian Early Childhood Association.

Hedegaard, M. (2009). Children's development from a cultural-historical approach: Children's activity in everyday local settings as foundation for their development. *Mind, Culture and Activity 16*(1), 64–81.

Hedegaard, M., & Fleer, M. (2008). *Studying children: A cultural-historical approach*. London, England: Open University Press.

Johnson, W. (2007). *Safety Education: Do kids know more than parents?* Shaker Heights Fire Department, Shaker Heights, Ohio, USA.

Jordan, B. (2004). Scaffolding learning and co-constructing understandings. In A. Anning, J. Cullen & M. Fleer, (Eds.), *Early childhood education: Society and culture* (pp. 31–42). London, England: Sage Publications Ltd.

Karpov, Y. (2003). Vygotsky's doctrine of scientific concepts: Its role for contemporary education. In A. Kozulin, B. Gindis, S. Ageyev & S. Miller (Eds.), *Vygotsky's educational theory in cultural context* (pp. 65–82). New York, NY: Cambridge University Press.

Kravtsov, G. G., & Kravtsova, E. E. (2009). Cultural-historical psychology in the practice of education. In M. Fleer, M. Hedegaard & J. Tudge (Eds.), *Childhood studies and the impact of globalization: Policies and practices at global and local levels. World Yearbook of Education* (pp. 202–212). New York, NY: Routledge.

Kravtsova, E. E. (2008). *Zone of potential development and subject positioning*. Paper presented at Vygotsky symposium, Monash University, Peninsula campus, 17 December.

Leontiev, A. (1964). *Problems of mental development*. Washington, DC: US Joint Publication Research Service.

Organisation for Economic Co-operation and Development (OECD). (2006). *Starting strong II: Early childhood education and care*. Paris, France: Organisation for Economic Co-operation and Development.

Quaraishi, A., Mickalaide, A., & Cody, B. (2005). *Follow the leader: A national study of safety role modeling among parents and children*. Washington, DC: National Safe KIDS Campaign.

Siraj-Blatchford, I. (2007). Creativity, communication and collaboration: The identification of pedagogic progression in sustained shared thinking. *Asia-Pacific Journal of Research in Early Childhood Education, 1*(2), 3–23.

Stetsenko, A., & Arievitch, M. (2004a). The self in cultural-historical activity theory: Reclaiming the unity of social and individual dimensions of human development. *Theory & Psychology, 14*(4), 475–503.

van Oers, B. (2009). Developmental education: Improving participation in cultural practices. In M. Fleer, M. Hedegaard & J. Tudge (Eds.), *Childhood studies and the impact of globalization: Policies and practices at global and local levels. World Yearbook of Education* (pp. 213–229). New York, NY: Routledge.

Victorian Curriculum and Assessment Authority. (2008).*Appendices*: *Analysis of curriculum/learning framework for the early years (birth to age 8)*. East Melbourne, Vic: Author.

Vygotsky, L. (1929). *Mind in society*. Cambridge, MA: Harvard University Press.

Vygotsky, L. (1962). *Thought and language* (E. Hanfmann & G. Vakar, Eds. & Trans.). Cambridge, MA: MIT Press.

Vygotsky, L. (1987). Thinking and speech (N. Minick, Trans.). In R. W. Rieber & A. S. Carton (Eds.), *The collective works of L.S Vygotsky: Vol 1, Problems of general psychology* (pp. 39–285). New York, NY: Plenum Press.

World Health Organization (WHO) and UNICEF (2008). Peden, M., Oyegbite, K., Ozanne-Smith, J., Hyder, A., Branche, C., Rahman, F., Rivara, F., & Bartolomeos, K. (Eds.). *World report on child injury prevention*. Geneva, Switzerland: WHO Press.

Zaporozhets, A. (1997). Principal problems in the ontogeny of the mind. *Journal of Russian & East European Psychology, 35*(1), 53–94.

SCHOOL CODES

Pilot Study Preschool 1 = PreSP 1

Pilot Study Preschool 2 = PreSP 2

Pilot Study Preschool 3 = PreSP 3

Pilot Study Preschool 4 = PreSP 4

Pilot Study Preschool 5 = PreSP 5

Pilot Study Preschool 6 = PreSP 6

Pilot Study Preschool 7 = PreSP 7

Main Study Preschool 1 = PreSM 1

Main Study Preschool 2 = PreSM 2

Main Study Preschool 3 = PreSM 3

Main Study Preschool 4 = PreSM 4

Chapter 7

Safety Risk Assessment Model: Concept Formation of Safety and Risk

Susie O'Neill

Abstract

There has been growth in research around strategies to reduce the high childhood injury rates worldwide. Literature tells us child injury prevention interventions frequently focus on programs and policies that target specific risk factors. Legislation and policy initiatives have been responsible for regulating and enforcing safe methods, influencing parenting practices and making physical and environmental changes. However, strategies that provide children and parents with a sense of agency in their safety learning have been underexplored. This paper presents a model of shared learning that promotes child–adult interactions to guide the conceptualisation of safety and risk.

Key words: Safety, risk, injury, preschool, education, early childhood

Introduction

Early childhood has become a key priority area for governments and non-government organisations across Australia. The response is due to issues of concern for children in the context of rapid social change, coupled with compelling evidence that early childhood years lay the foundations for children's future wellbeing, physical and mental capabilities (Australian Institute of Health and Welfare [AIHW], 2005).

Injury is the leading cause of death and the major cause of disability, which can have lasting effects such as loss of limbs or disfigurement. Between 2001 and 2003 there were 815 deaths and 66,000 hospitalisations in Australia as a result of injuries (AIHW, 2005). This paper introduces a model of safety learning as an educational strategy to address the childhood injury problem in Australia.

The *safety risk assessment model* engages families in mutually beneficial partnerships with education institutions where parents and children feel supported and empowered in their concept formation of safety. In this context, children have agency in the process that can transform family practices and understandings about safety.

Cultural-Historical Underpinnings

The safety risk assessment model draws on Vygotsky's (1987) insights into concept formation. He introduces the notion of everyday and scientific concepts in a child's development (Vygotsky, 1987). For Vygotsky, scientific concepts refer to academic concepts learnt through an educative process, mediated by others, whereas everyday concepts are developed from interactive life experiences in which the child is engaged (Vygotsky, 1987). He found the connection of everyday concepts and scientific concepts in the transformation of daily practice. In this context, everyday concepts, in which children have greater experience and knowledge, underpin scientific concepts that engage higher levels of thinking. The spontaneous nature of everyday concepts support and strengthen scientific concepts (Vygotsky, 1987). In an injury risk context, everyday concepts and scientific concepts interconnect to transform a child's safety thinking and practice in daily life. As the child acquires knowledge to further develop their understanding of injury risk, the new learning is used in everyday practice to avoid injury.

Vygotsky's (1994) found there was a need for an active connection between the "ideal" (best practices) and the "real" (everyday concepts) within a child's environment. The application of these ideas forms a framework for assisting and scaffolding the child's understanding of risk and safety.

Figure 7.1 represents the Safety Risk Assessment Model, illustrating the interactive and dialectical nature of theoretical ideas that contribute to the notion of a collaborative process for constructing and developing safety concept formation (O'Neill et al., 2013).

The Safety Risk Assessment Model

The safety risk assessment model represents the way that safety and risk is conceptualised. Embedded within the model is the child–adult relationship associated with how the environment is understood and acted upon through this interactive process.

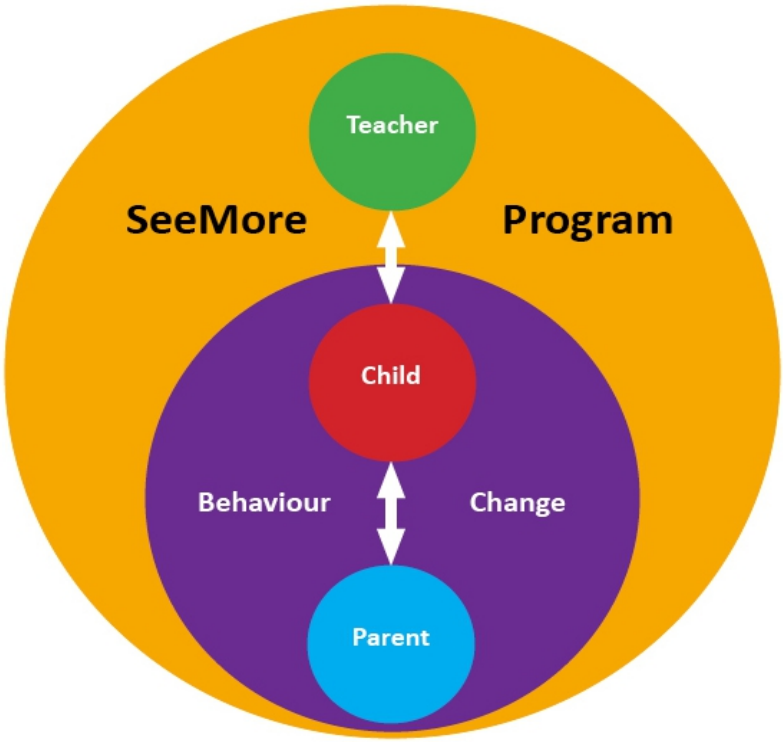


Figure 7.1. Safety risk assessment model.

In this context, opportunities for safety concept formation are determined by the relationship between the child and their social and material environments, mediated by the family and institutional practices. Consistent with Vygotsky's (1994) concept of ideal and real, the outer circle represents the ideal safety-learning environment and the inner circle represents the real development and understanding of safety the child has.

The outer circle: safety-learning environment. The outer circle depicts the safety-learning environment that includes the form of learning that the teacher sees as instrumental in shaping a child's sense of safety. In this context, the safety learning is constructed through the interaction of

the teacher, the child and parent. This child-centred interactive nature of the learning is considered fundamental for gaining safety knowledge to extend the child's ability to manage injury-related risks independently. The outer circle process takes the child to a higher order of internalised thought which advances the child's level of development. In this case, the social context of the situation changes as it adapts to accommodate the new learning as the child's capabilities grow.

Inner circle: real development and understanding of safety. The inner circle relates to the child's development and understanding of safety evident in the child's behaviour. The factors affecting the child's behaviour will be determined by the perceived nature and consequence of the circumstances presented to the child. The model illustrates the interrelationship between the child, the parent and the teacher, where the transfer of safety knowledge, understanding and behaviour change occurs at various levels.

This was evident in the findings of studies undertaken in the Geelong and Ballarat regions of Victoria, Australia (O'Neill et al., 2013). The studies collectively engaged 500 children attending preschools and kindergartens in a culturally and historically designed safety education program named SeeMore Safety. The findings of this study suggest that children play an important role in transferring safety knowledge to other family members where behaviour change occurred in children as well as the parents (O'Neill et al., 2013).

Complementary results were found in research conducted in the United States where children were responsible for changing fire safety behaviors of adults. In this example, transfer of fire safety knowledge from the children to parents was recorded, with 73% of participating parents reporting that fire safety practices in the home were influenced by their children (Johnson, 2007).

The relationship between the inner circle and the outer circle. The relationship between the real (inner circle) development and the ideal (outer circle) development is always understood in the context of the outcomes the teacher strives for. The child is at the nucleus of the shared-learning process which recognises the social context of the child in this psychologically significant form of safety conceptualisation. The child, being central to the new safety-learning process, provides a foundation for the concept of "self" as a powerful dimension within the model. In this context, the child has agency in the learning process. However, it is the interactive experiences the child has with the teachers and parents that will influence and help to shape the concept of self.

As part of the ideal form of development in the safety-learning process, consideration is given to the roles and positions each individual occupies within the learning structure (Stetsenko & Arievitch, 2004b). In this context, the psychological perspectives of safety and risk are oriented to more of a socio-psychological view with the presence of cultural-historical influences. A cultural-historical reading of safety risk assessment reflects a collaborative responsibility for shaping the child's safety and risk conceptualisation. At this time, complexities of societal and personal issues associated with injury risk can be brought together to advance safety learning through this shared-learning process. This suggests that behavioural change can be effective when conceptualised within a socio-cultural realm, where there is mutual influence between children and adults.

Safety Risk Assessment Model Concept to Counteract Risk Aversion

The safety risk assessment model offers an educational strategy for addressing tensions that often exist between risks and safety in communities. The model provides a means whereby parents and teachers can collaboratively work with children to expose them to healthy risks through play and everyday activities. Components of the model encourage children, on a daily basis, to assess situations and make good judgments that are important in safety risk learning. The thinking behind the safety risk assessment model is not limited by context as its application is extended to incorporate a risk-benefit analysis approach.

In this context, the safety risk assessment model assumes collective responsibility in shaping the child's individual ability to manage the situation that has created the risk. The aim is that the child will eventually do the analysis of the risk-creating situation independently. Including a risk-benefit analysis approach advances the decision-making process to incorporate the consequences of the action to its potential benefits.

Trends of parenting styles have been challenged in providing sensible strategies for keeping children safe. Smeyers (2010) suggests the role parents play in raising their children has been redefined along with the progression in risk thinking due to societal change and pressures. Children are being deprived of many opportunities and experiences for the sake of injury prevention (Brussoni & Olsen, 2012a), and such actions are responsible for creating risk aversion in some communities. This, coupled with occupational health and safety guidelines, has been responsible for bringing about the prohibition of certain activities in some Australian preschools and schools. Evidence of risk aversion in the Australian education system can be seen in a reference guide for government schools produced by the Victorian government. The *School Policy and Advisory Guide* provides

information on a range of operational policies and advice for its public schools (Department of Education and Early Childhood Development [DEECD], 2012). The guide is informed by legislative and regulatory requirements set out in the *Education and Training Reform Act 2006* and the Education and Training Reform Regulations 2007. The website has a section allocated to safety in physical education and sport, with subsections entitled "Activity precautions" and "Equipment precautions" that go to the extent of detailing such policies that state: "Students with long, thin necks must not play in the front or second row of scrums of rugby games either in the program, or in the school ground outside of the scheduled program" (DEECD, accessed 11 May 2012.).

Policies of this nature could be perceived to be excessively limiting children's involvement in opportunities that could produce significant gains in advancing the child's capacity to learn new skills and adjust to environments to avoid potential injury risks. According to Eager and Little (2011), children who are not exposed to risk and challenges that are important for their development, or have play restrictions placed on them, are predisposed to mental and physical health issues such as obesity.

Children need opportunities and experiences that are important for independently managing risk. Play in sport is important in growing cognitive, emotional, social and physical capabilities of children. Free play for children during the preschool years is equally as important because it is a main activity children engage in where valuable experiences are gained (Karpov, 2003). As well as understanding the significance of the free aspect of children's play, playtime also provides the opportunity for adults to mediate these experiences, where safe practices and the rules that often guide them can be encouraged. Karpov (2003) suggests play itself is directed by rules made by the children within the parameters of the roles they occupy during play.

Whilst rules have a purpose, too many rules can cause over regulation, where opportunities for self-development, independence, resilience, a sense of self-worth are restricted (Gill, 2007; Malone, 2007; Ungar, 2007). In this context, rules are counterproductive in advancing the actual characteristics needed for children to become responsible risk-takers. Eager and Little (2011) use the term *risk deficit disorder* to describe problems that children can experience as a consequence of attempts to remove risk from their lives. Strategies that take the approach to eliminate risk limit the opportunity for children to connect to the environment in the very way that helps them to read it. This approach assumes risk as individual and static, whereas the safety risk assessment model moves towards a cultural-historical reading of risk which is viewed as dynamic and relational.

The Safety Risk Assessment Model: A Dynamic Two-Way Process

It is the positioning of the child at the nucleus of the shared-learning process within the safety risk assessment model that represents the nature of the dynamic and relational underpinnings. Therefore the model can be understood as an active two-way process between the child and their social and material environments. Removing the risk as an injury prevention strategy as discussed in the previous section, repositions the child as having no ownership in the risk analysis benefits process. In this context, the child's abilities are underestimated, the judgment being that the child needs to be protected. To the contrary, the safety risk assessment model positions the child as having agency and valued in a risk benefits analysis reading of the situation.

Insight into understanding the mediation process of the safety risk assessment model can be drawn from the positioning of child in navigating the safety-learning course of action. The child's position adapts as the learning advances.

For instance, when the adult has greater capabilities and knowledge of the situation being attended to, the adult's position is "above" the child. Where the child and the adult collaboratively co-construct the learning, they take "equal" positions. In this situation, the child continues to have agency in the process even though the child is being supported through a developmental course of action in reaching new levels of understanding. Furthermore, the child can also be "above" the adult as the more knowledgeable of the two. In this case, the child becomes a powerful educator who can be responsible for changing parent and family safety behaviours and practices as found in the Victorian and USA studies referenced earlier. The positioning of the child provides stature for both agency and behavioural change that is used to navigate risk beyond the early childhood centre, and enables the child to make informed decisions on situations that present themselves in everyday life.

The model also helps to conceptualise the repositioning that takes place when the context changes in circumstances that are similar. For instance, using a child's relationship with a dog. The child may have a family pet dog that the child understands to be friendly and feels safe with. An adult calls into the family home, sees the dog and has no knowledge of its temperament. The child informs the visitor that the dog is friendly. In this scenario, the child is "above" the adult. The child then meets an unknown dog in an unfamiliar environment, like a guard dog in a workplace, for example. The adult in the workplace who understands the dog's nature becomes the knowledgeable person in informing the child not to approach the dog because it is a dog that is trained to guard. In this situation, the child is "below" the adult and the child's concept of "dog" has changed.

What is significant in all of these cases is the change that follows based on the connection between the child's position, the relationship the child has to the environment and the situation the child is attending to. This brings to the fore Vygotsky's (1987) theory on *the social situation of development* that represents the role the environment plays in the child's cognitive development (Bozhovich, 2009). Bodrova and Leong (2007) suggest the social situation is where the child's development advances to acquire the new skills and shape the child's growing competencies. Therefore, the child's ever-changing social situations present many different opportunities where the child adapts their position, or repositions, depending on the context of the circumstances. The child who has developed good safety risk understanding abilities would be capable of analysing a situation's potential risk in the context of the child's relationship to the circumstances.

Conclusion

The safety risk assessment model supports a collective learning educational strategy to address the childhood injury problem. Embedded within the model is this dynamic two-way process between the child and their social and material environments supported through a collaborative shared-learning practice with teachers and parents. \

The interactive and dialectical nature of the culturally and historically informed safety risk assessment model provides a framework for assisting and scaffolding a child's understanding of risk and the development of balanced decision-making regarding safety issues.

In this context, the relationship between risk, personal knowledge and contexts in which one lives is drawn together in a model that contributes to the notion that children are key factors affecting the provision and reception of messages central to the learning process.

The safety risk assessment model brings to the fore an interactive child–adult concept to process how the environment is understood and acted upon in the construction and development of safety concept formation as an educational solution to childhood injury prevention. Inclusion of a safety-learning practice model in the preschool curriculum provides a foundation and a new way forward for the next generation to become safety risk aware.

References

Australian Institute of Health and Welfare. (2005). *A picture of Australia's children* (No. PHE 58). Retrieved from http://www.aihw.gov.au/publication-detail/?id=6442467717

Bodrova, E., & Leong, D. (2007). *Tools of the mind: The Vygotskian approach to early childhood education*. Upper Saddle River, NJ: Pearson Education.

Bozhovich, L. I. (2009). The social situation of child development. *Journal of Russian and East European Psychology, 47*(4), 59–86.

Brussoni, M., & Olsen, L. (2012a). The perils of overprotective parenting: Fathers' perspectives explored. *Child: Care, Health and Development, 39*(2), 237–245.doi:10.1111/j.1365-2214.2011.01361.x

Department of Education and Early Childhood Development (DEECD). (2012). *Safety in physical education and sport*. Retrieved from (www.education.vic.gov.au/management/governance/spag/curriculum/safety/safesport.htm#H2N1005C

Eager, D., & Little, H. (2011). Risk Deficit Disorder. *Proceedings of the IPWEA International Public Works Conference*. Canberra, ACT, Australia, 21–24 August 2011.

Gill, T. (2007). *No Fear: Growing up in a risk averse society*. London, England: Calouste Gulbenkian Foundation.

Johnson, W. (2007). *Safety Education: Do kids know more than parents?* Shaker Heights Fire Department, Shaker Heights, Ohio, USA.

Karpov, Y. (2003). Vygotsky's doctrine of scientific concepts: Its role for contemporary education. In A. Kozulin, B. Gindis, S. Ageyev & S. Miller (Eds.), *Vygotsky's educational theory in cultural context* (pp. 65–82). New York, NY: Cambridge University Press.

Malone, K. (2007). The bubble-wrap generation: Children growing up in walled gardens. *Environmental Education Research*, *13*(4), 513–527.

O'Neill, S., Fleer, M., Agbenyega, J., Ozanne-Smith, J., & Urlichs, M. (2013). A cultural-historical construction of safety education programs for preschool children: Findings from SeeMore Safety, the pilot study. *Australasian Journal of Early Childhood, 38*(2), 74–84.

Smeyers, P. (2010). Child rearing in the 'risk' society*:* On the discourse of rights and the 'best interests of a child'. *Educational Theory, 60*(3), 271–284.

Stetsenko, A., & Arievitch, I. M. (2004b). Vygotskian collaborative project of social transformation: History, politics, and practice in knowledge construction. *The International Journal of Critical Psychology, 12*(4), 58–80.

Ungar, M. (2007). *Too safe for their own good: How risk and responsibility help teens thrive*. Crows Nest, NSW: Allen & Unwin.

Vygotsky, L. (1987). Thinking and speech (N. Minick, Trans.). In R. W. Rieber & A. S. Carton (Eds.), *The collective works of L. S Vygotsky: Vol 1, Problems of general psychology* (pp. 39–285). New York, NY: Plenum Press.

Vygotsky, L. (1994). The problem with the environment. In R. van der Veer & J. Valsiner (Eds.), *The Vygotsky Reader* (pp. 338–354). Oxford, England: Blackwell.

Chapter 8

Safety Risk Intelligence: Children's Concept Formation of Safety and Their Individual Capabilities to Appraise Risk of Injury

Susie O'Neill

Preface – Linkage of Paper Five

Paper five presented in this chapter is one of the most important papers of the thesis because it builds on vital published literature related to concepts of safety and risk. It also gives the details of the intervention program and presents exemplars taken from the data on how children responded to the intervention.

The term *safety risk intelligence* is new. The idea of including "intelligence" in this particular paper is a slightly bold move, but when conceptualised in a collective risk sense, the concept of intelligence takes a targeted form of safety that is related to capacity building.

In the following paper it is argued that when children are given the right opportunities, they can develop safety risk intelligence to capably manage safety and injury risk in their everyday life. The paper stimulates discussion on strategies to collectively construct knowledge on safety so that children can make informed safety decisions to enable them to become competent risk managers.

Abstract

Childhood injuries are a growing global public health concern and the main cause of death among children, worldwide. There are proven ways to reduce the likelihood and severity for each area of child injury. Notwithstanding this, children continue to suffer serious injury and death at significant rates in Australia and elsewhere. Strategies have tended to concentrate on identifying a risk factor and seeking ways to address the risk, independent of considering approaches that provide children with a sense of ownership of the safety issues.

There appears to be an absence of scholarly research examining a "collective risk intelligence" as a targeted form of safety-related capacity building. It is this latter safety risk conceptualisation, viewed holistically rather than by issue, that is the focus of this paper. In this paper, it is argued that when children are given the right opportunities, they can develop safety risk intelligence that equips them with understanding to manage their safety in everyday life. Findings from the SeeMore Safety case study, provide the foundation for arguing the concept of safety risk intelligence. How children transform their behaviours in relation to potential hazards in their environment and build a safety risk understanding is captured in the term "safety risk intelligence".

Introduction

Safety is an international concern. The World Health Organization (WHO) report (WHO & UNICEF, 2008) and the Australian National Injury Prevention and Safety Plan (NPHP, 2004) draw attention to the preventability of child injuries and present what is known about the effectiveness of intervention strategies. However, the development of these programs and policies has generally targeted the identification of risk factors and their causes. Recommendations focus on removing these risks or reducing children's exposure to them. It is acknowledged in the Australian National Injury Prevention and Safety Promotion Plan (NPHP, 2004) that events that are likely to result in injury should be avoided. The field of child safety has been quite divided between the scientific approach, where the focus is on reducing injury rates using a cause and effect approach (NPHP, 2004), and the academic view, where some risk is considered essential in enhancing physical, cognitive and social development (Wyver, Bundy et al., 2010), which is the view advocated in this paper. While acknowledging that children need safeguards, it is important to ensure that the models of practice followed do not limit what children might be "allowed to experience" (Fleer, 2010).

This paper argues that there is a place for a more nuanced safety curriculum within the education system that could be taught to young children as early as in the preschool years. In building upon a

cultural-historical view of child development, this paper provides an explanation of the dialectical relations between children's actions and their reasoning about safety to introduce the concept of "safety risk intelligence". The first section of the paper reflects on the safety risk intelligence concept to draw together the arguments that:

(1) safety and risk are contextually situated both in terms of their causes and conceptualisation

(2) children's active involvement and potential competence in assessing and interpreting safety and risk captures the intellect central to the management of risk, and can be developed

(3) injuries could be prevented through culturally and historically informed education programs where children are active participants in building their funds of knowledge to become competent risk-takers and safety managers.

The following section of the paper outlines the implications of the pedagogical approaches using the SeeMore Safety case study as an example (O'Neill et al., 2013). The study investigated how the SeeMore Safety resources contributed to injury prevention knowledge gain in preschool children. The findings demonstrated that it had a positive effect on the children's behaviour and reasoning about safety. These outcomes are used in this paper to form the basis of the argument for safety risk intelligence conceptualisation.

In the context of this paper, the term "preschool" refers to a preschool setting or kindergarten centre, and the term "preschool child" refers to a child, generally aged three to six years, who attends these facilities. The contextual and contested terms "safety", "risk" and "intelligence" are used to encapsulate a risk benefits analysis approach to a child's conceptualisation of their individual capabilities to appraise risk of injury. While the paper focuses on the relationship between risk, personal knowledge and the environments that form the child's everyday life, the paper also considers how risks are associated with structural inequalities that influence risk-creating situations.

There is much important published literature on the topic of children's involvement in evaluating risk (Bialostok & Kamberelis, 2010; Gill, 2007; Hutchby & Moran-Ellis, 1998; Morrongiello & Matheis, 2007; Tovey, 2007; Valentine, 1997; Wyver, Bundy et al., 2010; Wyver, Tranter et al., 2010); however, it is the notion of promoting "intelligence" and its application in relation to the concepts of safety and risk that is of significance. The term safety risk intelligence contributes to related terms that are used in the literature (Gill, 2007; Malone, 2007; Morrongiello & Matheis, 2007; Ungar, 2007; Valentine, 1997; Wyver, Tranter et al., 2010).

The Safety Risk Intelligence Concept

This section begins by briefly reviewing the concept of intelligence, followed by a more comprehensive discussion of safety risk intelligence as a concept.

Intelligence includes many abilities that are important in the development of balanced life skills – for instance, recognising one's own feelings and those of others, along with other social skills. According to Edgar and Edgar (2008), "intelligence is an ability to interpret, understand, and control life's experiences" (p. 141). Characteristics of intelligence include the concept of thinking before speaking and doing. Thinking before acting is critical to the notion of safety. Self-regulation is a term that best describes this, where the child's ability to act in a deliberate, intended manner governs the child's own behaviour (Bodrova & Leong, 2007). Rogoff (2003) argues that "research on culture and cognition has come to include recognition of the appropriateness of different approaches to tasks, depending on the ways that maturity and intelligence are conceived in different communities" (p. 252). Therefore, it is the way communities perceive intelligence that determines its meaning.

Safety and Risk Are Contextually Situated Both in Terms of Their Causes and Conceptualisation

In spite of the significant influences that can contribute to children's injury risk-taking, emotional factors have been found to play an important role in influencing safety-related behaviour. For a child to recognise an injury-risk moment and say "no" to dangerous impulses is one sign of safety reasoning that demonstrates intelligence where emotions play a role in decision-making. Seeking ways to address responsible risk independency requires understanding of the multi-determined nature of children's risk-taking. Findings from studies suggest that interventions should not only target cognitions, as typically done in the past, but also emotions (Morrongiello & Lasenby-Lessard, 2007; Morrongiello & Matheis, 2007).

The term "safety" is another subjective word that conjures up varying understandings and perceptions. According to the National Public Health Partnership (NPHP), safety means "being at little or no risk of injury" (NPHP, 2004, p. 2), and taking a holistic approach requires people to feel that they are safe as well as actually being safe. It could therefore be argued that safety is not only a survival mechanism, but also a means of providing emotional satisfaction, a sense of security and freedom, and a confidence to participate. A cultural-historical reading of safety is foregrounded on the belief that different conceptions and interpretations will develop, and these are based on culture, community, families and individuals.

The word "risk" is associated with exposure to danger, described as "the potential realisation of undesirable consequences from hazards arising from a possible event" (McGraw-Hill & Parker, 2002, p. 1820). Ungar (2007) argues that healthy risk-taking is required for a child's optimal growth and is a crucial component of identity formation. Exposure to a certain level of personal risk in everyday life is considered necessary to achieve certain benefits. Ungar quotes: "Too much risk and we endanger a child. Too little risk and we fail to provide a child with healthy opportunities for growth and psychological development" (2007, p. 3).

The case for a risk-benefit analysis approach is more desirable, although heavily dependent on the individual doing the analysis, influenced by the many cognitive and emotional factors that contribute to children's risk-taking decisions.

According to Morrongiello and Matheis (2007), many injuries happen during play when children are responsible for making their own decisions. Therefore, it is important to prepare children for periods when they are independent of supervision. This means providing children with an appropriate balance between protection and experiences to enhance risk-management skills so they may better understand their own capabilities. Such an approach encourages "good" supervision, where young people can be scaffolded by experienced others who will lead them to positive decision-making processes. Experience has been shown to be important in influencing children's decisions in injury-risk situations (Morrongiello & Dawber, 2004). How children predict and rate vulnerability and severity of the risk situation may vary depending on the task, prior experience and their culturally determined views. However, it is also important to note that the nature of the guidance provided to the child in influencing learning possibilities does not undervalue the child's abilities. Wyver, Tranter et al. (2010) build a strong and convincing case to argue that over-emphasising adults' roles in ensuring safety may be counterproductive and lead to underestimating a child's competence to take responsibility for themselves.

Children's Active Involvement and Potential Competence in Assessing and Interpreting Safety and Risk Captures the Intellect Central to the Management of Risk, and Can Be Developed

Injury prevention literature tends to be largely data driven and reflects the peak age groupings at which certain types of injuries occur. For example, the peak age group for hospital-treated fall injuries was five to nine years of age (Cassell & Clapperton, 2007). Injury-related statistics, such as falls, are often reported without referencing important information, like the frequency of use in

comparison to injury rate (Wyver, Tranter et al., 2010). Such data is significant in determining a risk-benefit analysis and strategies for preventing significant injuries. This paper takes a different approach to linking age with biologically and environmentally determined vulnerabilities of young children. It takes a philosophical view of child development being underpinned by cultural-historical theory, where social and cultural practices influence children's development and learning. While a cultural-historical view of development does not ignore biology, it does not position biology at the forefront of the child's learning, either.

Back as far as 1986, Venger (1986, 1988) argued that preschool children provided with proper instruction can master complex skills. In the case of a child learning to ride a bike, which involves identifying potential hazards, there are two levels of ability associated with this activity: first, the child's ability to master the skill of pedalling and riding the bicycle; and second, assessing the risk of the activity in the context of the environment where the bike riding is being carried out. Both skills require cognitive and physical abilities gained through experience, practice and physiological development, initially with a more capable person as a guide. Incorporating safety awareness into the activity takes the learning to a higher order of thinking and more advanced level of motor skill and cognitive development. As the child's capabilities develop, social context adapts to cater for new skill development, shaping the child's growing abilities (Bodrova & Leong, 2007). Therefore, the child's social situation is evolving to accommodate the new learning, or it is providing the next opportunity for the child to draw on their knowledge to inform their actions.

To understand fully the social situation of development and the effect it has on a child's growth, the child's emotional experience of the social and physical environments must be appreciated. According to Vygotsky (1994), it is the emotional experience the child has in the environment that determines what influences the child's development. Therefore, depending on the child's perception and prior experiences, the same environmental situation can influence a child's development differently. How the child makes sense and meaning of a situation based on the child's prior emotional experience will determine the safety risks. Every situation in a child's environment will have a different effect on each child. That is, each child will experience the same situation differently, based on what they bring to the situation. For example, a child who swings across the monkey bars reaching the other side has a sense of satisfaction, as shown in Figure 8.1.

Figure 8.1. A child demonstrating his ability to safely cross the monkey bars.

A child who has attempted the same activity and falls from the monkey bars may view the experience as painful. The perceived level of risk of injury for the second child is far greater than the first due to the same activity having a completely different emotional experience and meaning for each child.

In this paper, it is argued that cultural-historical theory foregrounds interactive learning towards predetermined co-construction of knowledge, where the child's conceptualisation of safety/risk matters. However, it is equally as important in this co-construction of knowledge process that the adult roles in child development are not over-emphasised in areas where the child's freedom to grow is compromised, such as in play. There is important literature on diminishing play opportunities for the sake of safety (Gill, 2007; Malone, 2007; Wyver, Bundy et al., 2010; Wyver, Tranter et al., 2010); however, in this paper there is no advocating of risk aversion, but rather the argument put forward is that risk-taking is essential in cultivating a safety intellect. The emphasis is on providing children with tools and experiences that include challenges and risk-taking to build concepts and skills as a foundation for deeper thinking, leading to a safety risk intellect.

Injuries Could Be Prevented through Culturally and Historically Informed Education Programs, Where Children Are Active Participants in Building Their Funds of Knowledge to Become Competent Risk-Takers and Safety Managers

Cultural-historical theory provides an alternative framing for the concept of developing safety risk management capabilities in young children.

According to Bodrova and Leong (2007): "At the end of kindergarten, young children should be capable of self-regulation – the ability to act in a deliberate, planned manner in governing much of their own behaviour" (p. 127).

This includes being able to adjust to their physical and emotional behaviours as well as some of their cognitive behaviours. The relationship between the child's intentions and subsequent actions highlights the underlying concept of safety risk intelligence. Its principle is that the child thinks first about the level of risk associated with the situation and then acts, taking into consideration prior experiences, knowledge, self-awareness and his or her own capabilities. According to Bodrova and Leong (2007), a truly self-regulated child thinks first and acts later.

The ability to develop safety capabilities in children requires the creation of innovative strategies that can be tested and measured through longitudinal studies to encourage authorities to adopt injury prevention programs within the early years curriculum. This can be achieved through well-designed injury prevention programs that do not limit children's capacities to develop the competencies they need to become responsible risk-takers. Where children are able to explore their social and material world to foster new knowledge and experiences for developing risk management skills, resilience and positive safety behaviours emerge.

To introduce safety-related learning into educational settings at a time where the developmental capabilities of a child's intentions and the response to the situation are planned and deliberate is opportune. There have been some good programs that have been introduced into schools to address children's health issues. For example, Stephanie Alexander's school garden program (Alexander, 2001) encourages healthy eating and cooking options for children. The Victorian "Premier's Active Families Challenge" (YMCA Victoria, 2008) is designed for children and their parents to exercise for 30 minutes per day together. Like these good and welcomed initiatives, injury prevention initiatives also have their place. Injuries give cause for alarm with more children dying and becoming disabled from injury than any illness or disease (NPHP, 2004; WHO & UNICEF, 2008), and it is likely these injuries could have been prevented through education initiatives.

In recent decades there has been an exponential growth in research around child safety, risk management and injury prevention; however, shared-learning programs that engage others as a strategy to address the injury problem have been underexplored. Children learn through social interactions with their parents, teachers, peers, other children, and sometimes their siblings. Early childhood play-based programs that promote a shared-thinking approach between children and teachers have been shown through research to greatly influence children's achievement in later school learning (Siraj-Blatchford, 2004, 2007). Genuine self-development in children requires a lot of guidance, particularly with regard to safety. However, children may not receive the sort of guidance, be taught the skills, or be provided with the knowledge that helps them to make choices to act responsibly in relation to their safety by one source alone. Sharing the responsibility through education-based programs broadens the opportunity to stimulate safety-related learning through the engagement of others.

The involvement of parents at the preschool level provides the opportunity to introduce shared-learning programs that inform parents of the most recent safety-related knowledge. Their involvement ensures consistency in the safety messages that eliminates the potential gaps that can develop between what children learn in preschool settings and their ability to apply the learning at home. According to Wise and Sanson (2000), when the child's experiences at home differ considerably from their experiences in educational settings, "dual socialisation" occurs. An example of this was reported in a paper entitled *A cultural–historical construction of safety education programs for preschool children: Findings from SeeMore Safety, the pilot study* (O'Neill et al., 2013), where the father took his preschool son to kindergarten on a bike with neither of them wearing helmets. The preschool that the boy attended participated in an injury prevention program that included a bike safety component where the children were introduced to the importance of wearing helmets. The son's experiences at home were significantly different to the experiences in the educational setting.

Fleer and Williams-Kennedy (2002) argue that a child's learning and development is best supported when there is a strong relationship between a child's home learning and educational experiences. It is generally acknowledged that families are the most important educators of their children, and when the learning process is supported through early childhood services and education, there is consistency and the most up-to-date information is available. Consistency within the safety context is fundamental to ensure safety messages and the transfer of knowledge is best practice, as knowledge in this field is forever advancing. Building on the accepted fact that early childhood

education contributes to lifelong learning, investing in safety in the early years provides a pathway to reducing the incidence of childhood injury.

Framing risk in early childhood education should support practices that encourage rather than undermine children's growing competencies. However, it is important to acknowledge that the safety and risk field is conceptualised as a narrow skills-based area, framed through the child development lenses of ages and stages, which is a traditional model of child development. It is at odds with how development is conceptualised within the field of early childhood education, where a broad range of child development theories are supported, not just a traditional developmental or maturational model (DEEWR, 2009). The field of safety and risk has been blind to a more holistic view and, in particular, a model of safety risk intelligence as theorised in this paper, which examines children's competencies to interpret their environment and act with conscious understanding of their own personal safety and injury risk.

There are effective preschool intervention programs that educate children about targeted safety issues, such as sun and road safety (Loescher et al., 1995; Thomson, Tolmie, Foot, & McLaren, 1996). One particular study examined the effects of a preschool sun safety program, where the results demonstrated a significant effect on the children's knowledge and comprehension related to sun safety (Loescher et al., 1995). However, the study did not attempt to link reasoning with behavioural change. It appears there are limited studies that have investigated whether children are able to apply the safety knowledge gained to real-life circumstances (Loescher et al., 1995) and act with understanding. Trials were recently conducted using an intervention program named SeeMore Safety to examine the effectiveness of a safety education program in relation to the child's knowledge of their environment and how to act safely in it in everyday life (O'Neill et al., 2013).

The SeeMore Safety program was used as the primary resource for the research because, at the time, a program featuring broad-based safety subject matter could not be found. To provide a full and detailed account of the research supporting the program is not possible within the confines of this paper. (For details of the research underpinning the program, see O'Neill et al., 2013.) The evidence of the effectiveness of the program (O'Neill et al., 2013), and the child development theory underpinning the program, together, give new directions for safety and risk in early childhood education that is in keeping with the Australian government's Early Years Learning Framework (EYLF) (Department of Education, Employment and Workplace Relations [DEEWR], 2009).

In this paper, it is not the SeeMore Safety program that is being promoted but the holistic nature and concept behind safety education programs with broad-based subject matter. This section has examples of the program materials, how early childhood teachers used them, and reflections and observations made by the teachers who implemented the SeeMore Safety program.

SeeMore Safety

SeeMore Safety is a safety education resource designed for preschools, kindergartens and day care centres. The aim of the program is to provide a foundation for children's conceptualisation of safety and whole-of-life safety culture, where children's safety knowledge, self-awareness and behaviour are improved (O'Neill et al., 2013). The study involved 11 preschools located in two regions – Geelong and Ballarat – in the state of Victoria, Australia. It consisted of two components – a pilot and a main study – which generated data for the research project.

The pilot study was conducted by the City of Greater Geelong (Geelong City Council) through its "SafeStart" program. It was undertaken in consultation with, but independently of, the author, who designed the SeeMore Safety program to limit any potential bias. While the pilot aimed to establish any changes in the children's safety conceptualisation, it was also able to determine the suitability of the program content for preschool children (face validity), as well as the reliability of testing instruments.

Three hundred and fifty children – 198 from the pilot and 152 from the main study – together with 205 parents and 11 teachers participated in the intervention program and related research project. A mixed method research design was adopted in this study combining qualitative and quantitative measures, involving pre- and post-testing procedures, questionnaires, focus group discussions and interviews. Using these methods provided information about how children perceived safe and unsafe situations and determined any changes in their safety knowledge, attitudes and behaviour following the intervention program. The study found the safety program to be an effective shared-learning resource.

However, its purpose was not solely to evaluate the effectiveness of the SeeMore Safety program; the preschools were encouraged to include complementary resources as well, such as "sun, road and water safety" programs. What was important was how the children engaged in dialectical relations with their material and social worlds to interpret their environment and act within it using the knowledge gained from the safety education programs. Interventions of this nature are culturally and

historically grounded and require the children to interact with the teachers and parents to co-construct new safety learning and understanding. They offer opportunities for new skill development in a repetitive way but in different situations and experiences that help the child internalise the varying contexts. This then becomes part of their repertoire for acting safely.

The SeeMore Safety program is delivered in the preschool or kindergarten through teacher-guided interaction with the children, enhanced by the home support program, which includes parent participation. This shared-thinking approach extends the learning from children and teachers to their parents, siblings and other children. The resources provided to the preschools in the trials were focused around a series of children's picture books. The safety themes in the books portrayed children participating in popular activities. The program provided the children with opportunities to interpret their environment and act with understanding through the combination of putting into practice the principles outlined in the resource material and their social interactions with teachers, parents, and in some cases, other children.

In one activity, the children were fitted with appropriately sized helmets and bikes, and provided with knowledge of the importance of wearing helmets of the correct size for safety reasons.

Figure 8.2. A child having a helmet fitted.

Teacher observations drew attention to one child sharing her new knowledge with a friend: “Lucy was explaining to Chloe that the bike she was selecting was too big for her and that she could fall off and hurt herself” (PreSP 1).

Building on safety messages featured in the books and during the bike safety activities, Lucy was able to comprehend the new learning and apply it to this situation. While Lucy demonstrated having agency in this scenario, she was also able to apply the new knowledge gained initially from imaginary situations to realistic thinking. Knowledge of body–object relationship was evident in Lucy’s conceptualisation of the risk posed by the bike in relation to the child’s body size. The psychological significance of this level of safety understanding not only positioned the child as having agency where she is influential in her own learning but also in that of others.

Each safety theme introduced the children to unsafe and safe practices that first appeared as books and games and were then experienced in real-life situations. One activity required the children to bring along photographs of safe and unsafe practices to share with the other children, often inspired by the animated pictures presented in the books and games, examples of which are shown in Figure 8.3.

Figure 8.3. Activity cards depicting unsafe and safe bike practices.

Figure 8.3 displays two cards depicting unsafe and safe practices that the children were asked to comment on. The children agreed that the picture of the character not wearing a helmet represented

unsafe behaviour and the picture with a helmeted rider demonstrated a safe practice. To coincide with the animated picture cards, one child brought along a series of photographs of himself wearing a helmet that included a photo that he called a "trick" photo.

Figure 8.4. Child with no helmet.

Figure 8.5. Child with helmet undone.

Figure 8.6. Child with helmet done up.

The group discussed the images and agreed the depiction in the first photo (Figure 8.4) was unsafe because the child was not wearing a helmet; the depiction in the second photo (Figure 8.5) was "unsafe" because the helmet is undone and it could fall off' (PreSM 1); and the depiction in the third photo (Figure 8.6) was safe because the helmet was done up. Safety-related conceptual understanding was evident in the correlation between the animated pictures and real-life photos in this instance. This is an example of the learner's ability to correlate imaginary situations with realistic thinking.

The conceptualisation of imaginary situations within realistic thinking was also evident in data gathered from informal interviews with teachers. The teachers noted that the children had included their new learning in play-based and role-playing activities, where imaginary situations aligned with realistic thinking. For instance, one teacher observed children making a crossing in the playground (PreSM 3). The teacher extended the children's learning to include an excursion that enabled the children to practise traversing the road at designated crossings and to use traffic lights. In this example, the learning process began by embedding in the mind the images and messages from the storybooks, playing out those messages in imaginary situations and then experiencing a real-life scenario, where imagination and play connects with reality through a teacher-guided activity. The problem-solving capabilities of the children in collaboration with a teacher in these situations are far

greater than the children could have achieved independently. Adult involvement does not interrupt freedom of play. Rather, it is extended to incorporate a skills-based activity.

Consistent with Vygotsky's (1994) concept of the need for an active relation between the ideal (best safety practices) and real (everyday contexts) within a child's environment, the children applied responsible risk management knowledge and skills to real-life contexts gained through the program. Parents and teachers reported on the children's ability to create new levels of consciousness in relation to their safety and situation in the environment. This suggests that the child's awareness of safe practices in their environment is connected to the child's perceptions of unsafe situations within that environment. It is a source of development in itself, as the children were able to recognise whether situations or acts were safe or unsafe.

Teachers and parents reported on positive changes in the children's safety behaviour. One teacher commented on twins that were walked to preschool by their grandmother on a restraint; after completing the program, the children no longer needed to be restrained (PreSP 4). In this example, the children demonstrated positive safety behaviour change in their daily routines, revealing capabilities of self-regulation which, in turn, gave the grandmother an increased level of trust in her grandchildren's ability. With this new level of trust, the children were able to advance their learning and gain increased independence.

Often when trust and a level of freedom is gained, the social position of the child may change. Bozhovich (2009) provides ideas on the "concept of the place that children occupy within the system of social relationships available" (p. 75). This applies when a child is perceived to be more responsible because of an assumed knowledge of safety. According to Bozhovich (2004), it is not only the child's attitude and relationship to their environment that is central for a child's development, but the social interaction must also include both intellectual and affective elements of consciousness in what they are experiencing and attending to. This is an example of the social context adapting to the new skills responsible for forming the child's growing competencies (Bodrova & Leong, 2007). The child's social situation is evolving to cater for the new learning or the new demands. New demands that pay attention to safe and unsafe situations provide a means by which the child contributes towards new activities through thinking and action, creating new levels of safety consciousness. This is a source of development in itself.

Conclusion

The term safety risk intelligence has been introduced to best describe safety concept formation in children where their competencies and skill development empower them to take ownership of their own safety. The child's ability to acquire and effectively apply safety knowledge, skills and reasoning means the child is at minimal risk of injury when exposed to danger. Contextually situated in terms of their causes and conceptualisation, safety and risk require a risk-benefit analysis, rather than a risk assessment approach for a child to make good judgment with positive outcomes. The level of intellect in this case is not restricted to the cognitive and traditional IQ measures commonly associated with intelligence, but is representative of more broad, everyday skills built on knowledge and experiences. The child's active involvement and potential competence in understanding a particular situation that may pose an injury or risk, and then making a conscious decision to not engage in what is perceived to be dangerous, captures the concept of safety risk intelligence.

This paper provides examples of how children's interactions with their teachers and parents can guide their ability to conceptualise safety risk situations. It is argued that injuries could be prevented through culturally and historically informed education programs where children interact with others to jointly construct a context for their safety-related learning. In this learning context, they are active participants and have agency in building their funds of knowledge. Children becoming independent and competent risk-takers and safety managers goes beyond singling out targeted risk factors. Safety risk intelligence is symptomatic of the child using deeper brain functions to achieve self-understanding – a form of safety reasoning within itself. It encapsulates a holistic approach to an integrated way of thinking
about safety.

This theory of safety risk intelligence has been drawn from cultural-historical views of childhood development, relevant literature and studies involving the injury prevention program, SeeMore Safety. Opportunities will arise for further studies to apply other safety education programs to trial the concept of safety risk intelligence. However, in future studies, the need to check children's prior experiences before commencing such programs adds an important caveat to the argument in relation to safety intelligence development conceptualisation.

A limitation of this study was the fact that the children's prior experiences were not noted before commencing the SeeMore Safety program. Therefore the study did not take into account the situation of children for who safety may have been compromised. For children who have

experienced chronic stress or trauma, their ability to process information in a way that adapts to new or changing circumstances may have been adversely affected.

This paper concludes that safety risk intelligence can be developed through firsthand safety related experiences, combined with achievable challenges and play opportunities that provide a rich context for knowledge gain. The concept of safety risk intelligence is consistent with the focus on supporting a wider view of child development as outlined in the EYLF (DEEWR, 2009), as well as providing some theoretical thinking about safety and risk often discussed in relation to the *National Quality Standard*.

Endnotes

While the author was also the originator of the SeeMore Safety program, the study was designed for objective observation by independent facilitators.

Names that appear in this paper are pseudonyms. A coding system was used to identify preschools for confidentiality reasons.

References

Alexander, S. (2001). *Kitchen Garden Foundation*. Retrieved from http://www.kitchengardenfoundation.org.au

Bialostok, S., & Kamberelis, G. (2010). New capitalism, risk, and subjectification in an early childhood classroom. *Contemporary Issues in Early Childhood, 11*(3), 299–312.

Bodrova, E., & Leong, D. (2007). *Tools of the mind: The Vygotskian approach to early childhood education*. Upper Saddle River, NJ: Pearson Education.

Bozhovich, L. I. (2004). L. S. Vygotsky's historical and cultural theory and its significance for contemporary studies of the psychology of personality. *Journal of Russian and East European Psychology, 42*(4), 20–34.

Bozhovich, L. I. (2009). The social situation of child development. *Journal of Russian and East European Psychology, 47*(4), 59–86.

Cassell, E., & Clapperton, A. (2007). Preventing unintentional injury in Victorian children aged 0–14 years: A call to action. *Hazard, 65*: 1–14. Victorian Injury Surveillance Unit (VISU). Melbourne, Vic: Monash University Accident Research Centre.

Department of Education, Employment and Workplace Relations. (2009). *Belonging, Being and Becoming – The Early Years Learning Framework for Australia*. Retrieved from http://www.deewr.gov.au/earlychildhood/policy_agenda/quality/pages/earlyyearslearningframework.aspx

Edgar, D., & Edgar, P. (2008). *The new child: In search of smarter grown-ups*. Melbourne, Vic: Wilkinson Publishing Pty Ltd.

Fleer, M. (2010). *Early learning and development: Cultural historical concepts in play*. New York, NY: Cambridge University Press.

Fleer, M., & Williams-Kennedy, D. (2002). *Building bridges: Research literacy development for young indigenous children*. Canberra, ACT: Australian Early Childhood Association.

Gill, T. (2007). *No Fear: Growing up in a risk averse society*. London, England: Calouste Gulbenkian Foundation.

Hutchby, I., & Moran-Ellis, J. (1998). *Children and social competence: Arenas of action*. London, England: Falmer Press.

Loescher, L., Emerson, J., Taylor, A., Hendrickson-Christensen, D., & McKinney, M. (1995). Educating preschoolers about sun safety. *American Journal of Public Health, 85*(7), 939–943.

Malone, K. (2007). The bubble-wrap generation: Children growing up in walled gardens. *Environmental Education Research*, *13*(4), 513–527.

McLachlan, C., Fleer, M., & Edwards, S. (2010). *Early childhood curriculum: Planning, assessment and implementation*. Melbourne, Vic: Cambridge University Press.

Morrongiello, B., & Dawber, T. (2004). Identifying factors that relate to children's risk-taking decisions. *Canadian Journal of Behavioural Science, 36*(4), 255–266.

Morrongiello, B., & Lasenby, J. (2007). Psychological determinants of risk taking by children: An integrated model and implications for interventions. *Injury Prevention, 13*(1), 20–25. doi:10.1136/ip.2005.011296

Morrongiello, B., & Matheis, S. (2007). *Understanding children's injury-risk behaviors: The independent contributions of cognitions and emotions*. Psychology Department, University of Guelph, Ontario, Canada.

National Public Health Partnership. (2004). *The national injury prevention and safety promotion plan: 2004–2014*. Canberra, ACT: Author.

O'Neill, S., Fleer, M., Agbenyega, J., Ozanne-Smith, J., & Urlichs, M. (2013). A cultural-historical construction of safety education programs for preschool children: Findings from SeeMore Safety, the pilot study. *Australasian Journal of Early Childhood, 38*(2), 74–84.

Parker, S. (2002). *McGraw-Hill dictionary of scientific and technical terms* (6th ed.). New York, NY: McGraw-Hill.

Rogoff, B. (2003). *The cultural nature of human development*. New York, NY: Oxford University Press.

Siraj-Blatchford, I. (2004). Quality teaching in the early years. In A. Anning, J. Cullen & M. Fleer (Eds.), *Early childhood education: Society and culture* (pp. 137–148). London: Sage.

Siraj-Blatchford, I. (2007). Creativity, communication and collaboration: The identification of pedagogic progression in sustained shared thinking. *Asia-Pacific Journal of Research in Early Childhood Education, 1*(2), 3–23.

Thomson, J., Tolmie, A., Foot, H., & McLauren, B. (1996). *Child development and the aims of road safety education: A review and analysis*. Road Safety Research Report No. 1. UK: Department of Transport. Retrieved from http://www.dft.gov.uk

Tovey, H. (2007). *Playing outdoors: Spaces and places, risk and challenge*. Maidenhead, England: Open University Press.

Ungar, M. (2007). *Too safe for their own good: How risk and responsibility help teens thrive*. Crows Nest, NSW: Allen & Unwin.

Valentine, G. (1997). "Oh yes I can." "Oh no you can't": Children and parents' understandings of kids' competence to negotiate public space safely. *Antipode, 29*(1), 65–89. doi: 10.1111/1467-8330.00035

Venger, L. A. (Ed.). (1986). *Development of cognitive abilities in preschool education*. Moscow, USSR: Pedagogika.

Venger, L. A. (1988). The origin and development of cognitive abilities in preschool children. *International Journal of Behavioral Development, 11*(2), 147–153. doi: 10.1177/016502548801100201

Vygotsky, L. (1934). *§14. The problem of the environment*. In R. van der Veer & J. Valsiner (Eds.), *The Vygotsky reader* (pp. 338–354). In the fourth lecture published in Vygotsky, L. S. 1935: *Foundations of Paedology*. (pp. 58–78).

Vygotsky, L. (1994). The problem of the environment. In R. van der Veer & J. Valsiner (Eds.), *The Vygotsky reader* (pp. 338–354). Oxford, England: Blackwell.

Wise, S., & Sanson, A. (2000). *Child care in cultural context: Issues for new research*. Melbourne, Vic: Australian Institute of Family Studies.

World Health Organization (WHO) and UNICEF (2008). Peden, M., Oyegbite, K., Ozanne-Smith, J., Hyder, A., Branche, C., Rahman, F., Rivara, F., & Bartolomeos, K. (Eds.). *World report on child injury prevention*. Geneva, Switzerland: WHO Press.

Wyver, S., Bundy, A., Naughton, G., Tranter, P., Sandseter, E. B., & Ragan, J. (2010). Safe outdoor play for young children: Paradoxes and consequences. In S. Howard (Ed.), *AARE International Education Research Conference*. Retrieved from http://www.aare.edu.au/10pap/abs10.htm

Wyver, S., Tranter, P., Naughton, G., Little, H., Sandseter, E. B., & Bundy, A. (2010). Ten ways to restrict children's freedom to play: The problem of surplus safety. *Contemporary Issues in Early Childhood, 11*(3), 263–277.

YMCA (2008). *The Victorian Premier's Active Families Challenge*. Retrieved from http://victoria.ymca.org.au/cpa/htm/htm_article.asp

Chapter 9

Better Than Bubble Wrap – Do We "Over Regulate and Over Protect" Children at the Expense of Them Learning How to "Take Risks"?

Declaration for Thesis Chapter 9

Declaration by candidate

Nature of contribution	Extent of contribution (%)
Susie (Sueanne) O'Neill	95%

The following co-authors contributed to the work:

Name	Nature of contribution	Extent of contribution (%) for student co-authors only
Professor Marilyn Fleer	Reviewed paper and contributed to the work	

The undersigned hereby certify that the above declaration correctly reflects the nature and extent of the candidate's and co-authors' contributions to this work*.

Candidate's Signature	[redacted]	Date 18/04/2015

Main Supervisor's Signature	[redacted]	Date 18/04/2015

Preface – Linkage of Paper Six

Paper six is an exploration of play opportunities and experiences that were found to be important in shaping childhood safety understandings but are under challenge from the threat of over-protective social change in Western society.

It became apparent from the beginning of the study that there were divided views on the level of risk that parents and teachers should allow children to be exposed to in view of perceived societal dangers. The attitudes of the teachers and the risks they would allow therefore played a major part in the effectiveness of the "SeeMore Safety" program.

The preschools that took the children on excursions and activities to extend the children's experiences beyond the classroom provided a far greater holistic experience. Children were able to connect activities that they had engaged in through the books, games and imaginative play activities to real-life situations where they were able to practise their new safety learning.

This led to further investigation into what was the current thinking in the area of children's safety in terms of current societal views and practices. It appeared that risk aversion was often created by tensions and challenges that communities faced with regard to risk and safety, where so-called solutions tended to become counterproductive.

In the following paper, reviewed literature ,together with public and media commentary, suggests children are being deprived of important opportunities to develop resilience, self-awareness, social connectedness and safety knowledge. The paper argues that in designing sensible injury risk strategies, communities should be mindful of "bubble-wrap" solutions and the promotion of risk-averse societies.

ASIA-PACIFIC JOURNAL OF RESEARCH
IN EARLY CHILDHOOD EDUCATION
Vol.9, No.1, January 2015, pp.65-81

ISSN 1976-1961

BETTER THAN BUBBLE WRAP: Do we "over regulate and over protect" children at the expense of them learning how to "take risks"?

Susie O'Neill[1)] **Marilyn Fleer**

Monash University

Abstract

Throughout the World more children die and are disabled from injury than illness and disease, despite the fact that we are living in a society that is perceived to be safer than it has ever been. Environment and product modification means we have safer cars, homes, workplaces and play areas. Legislation and policy approaches have been introduced to regulate and enforce safe practices. However, in some cases this has brought about an over regulated and over protective societal change. Experiences and tasks once enjoyed by children are now often regarded as dangerous and irresponsible. The freedom of children to experience life in a way that allows them to develop competencies they need to become competent risk managers can be been hampered by over regulation of governing bodies and over protective practices of parents and caregivers, creating a bubble-wrapped generation in some communities. This paper captures an approach where child safety is reconceptualised by introducing a cultural-historical informed *safety risk assessment model* pushing against the current trend towards bubble-wrapped solutions to childhood injury prevention.

Keywords : safety, preschool, education, injury risk, early childhood, bubble wrap

Corresponding author, [1] [redacted]

Introduction

Balancing safety and the opportunity for children to develop, enjoy, contribute and achieve is a contested issue. New thinking on safe practices has brought about change in parenting, education and child policy in many nations (Brussoni, Olsen, Pike & Sleet, 2012). Concern for children's safety are often fueled by myths around perceived societal dangers has encouraged some neighborhoods to become quite risk averse. Understanding that whilst children need safeguards, it is important to ensure that measures intended to protect children are not counterproductive. But most models of practice follow a developmental approach, limiting what children might be "allowed to experience" (Fleer, 2010). What is needed is a new way of framing risk in early childhood education, so that practices support rather than undermine children's growing competencies. In this paper we draw upon an Australian context to foreground a new way of thinking about children's safety risk learning. A reconceptualisation of how safety can be understood is presented. In drawing upon cultural-historical theory we introduce the concept of *shared learning for safety risk assessment*, and present a *model of practice* for preschool aged children. Specifically, we argue that children learn about safety by actively engaging in risk assessments of their environment.

In this paper the term "preschool" refers to preschool settings or kindergarten centres, and preschool children refers to children aged 3 to 6 years who attend these facilities. The term "Risk" is used in this paper to foreground the concept of chance associated to injury. The word is often perceived as a negative connotation, however it can also be positive and negative. Subjective by nature, the term risk is variably understood as perceptions are based on individual experiences and characteristics which may influence its meaning. In most cases risk involves a degree of loss and is often associated to exposure to danger and physical risk (Breivik, 1999). It can be argued that healthy risk-taking is required for a child's optimal growth. As noted by Ungar (2007, p.3), "Too much risk and we endanger a child. Too little risk and we fail to provide a child with healthy opportunities for growth and psychological development".

Whilst many factors influence children's injury risk taking, we believe understanding what is dangerous is a personal perception where emotions play an important role in decision-making and consequently in influencing safety related behaviour. For a child to recognise an

injury risk and make a conscious decision not to engage in a dangerous situation is a form of safety reasoning within itself. The term "bubble-wrap" inspired in this paper by the work of Malone (2009), conceptualises the counter-productive practices applied as solutions to deal injury risk situations.

Re-conceptualising injury risk and Prevention using cultural-historical concepts

The complexities of addressing the childhood injury problem through education is challenging and evident in the Australian context, but is clearly also an international priority (NPHP 2004; WHO 2008). What is needed is a new way of conceptualising safety, not as something within the child or within the environment, but rather as a relationship between the child and the environment through social mediation. To conceptualise how safety can be better understood within the injury risk landscape, we draw upon cultural-historical theory to introduce the concept of a shared learning *safety risk assessment model* for preschool children growing up in Western communities.

Examples of childhood safety concerns that do not reflect the real level of risk, fueled by misleading perceptions of childhood dangers, are highlighted in the following section of the paper. We view safety and risk reasoning at a personal level where conceptualisation is associated with the individual's capabilities, knowledge and experiences. Ungar (2007) argues that what is a risk to one child may be considered safe to another due their social situation of development (Bozhovich, 2009). For instance, Vygotsky (1994) draws attention to how the same situation may be experienced differently by different children. He illustrates through his own empirical research, the example of a single parent family with young children, where the mother was engaged in substance abuse, and where each child related to this same environment differently because of their particular social situation of development. The youngest child could not understand that the mother was ill, and was angry that his needs were not met. The eldest child at ten years of age understood and took on the role of being the parent, caring for the other children. Each child was in the same situation, but each child was experiencing this same situation differently due to what they brought to the situation.

Cultural-historical theory signifies the importance of both the environment and the social situation of development of the child (Bozhovich, 2009; Vygotsky 1994).

We argue that safety cannot be understood as a statistic of injury or as a process of simply reducing injury through changing the environment. But rather, safety should be conceptualised as a special relation between the child and the environment. It is our belief that children learn about safety by actively engaging in experiences and risk assessments of their environment as both a social and personal process. According to Vygotsky (1987), human learning transpires from the internalisation of social relationships. His theory include a wholeness approach to understanding the child's development through the complexities of the child's social situation (Fleer, 2010). Central to a cultural-historical view of child development is the child's social and material environment and the dialectical relation between the ideal and the real circumstances present within it. Here the ideal means the real world conditions that children could potentially experience during their life-time. The real represents their current competencies to risk assess. It is the relations between the ideal world experience and the real child competence that are mediated by more competent others, such as educators and parents. According to Vygotsky (1994) it is through the child's relationship with their social and material world that they understand and make meaning of situations. The social situation of development as a special relationship between the child and the environment (Vygotsky, 1934), is a new way of conceptualising safety risk assessment. Here the adult plays an important role in mediation, as noted by Ungar (2007, p. 20), "a concerned parent provides scaffolding for growth, not just a life jacket for safety".

In this conceptualisation of the relationship between the child and the environment, support is in advance of the child's competence. Building competencies independent of over protectiveness is important because the support from adults includes expectations of the child being able to collectively read risky situations or being able to engage in activities with higher levels of risk. In a cultural-historical reading of risk assessment, the experiences the child engages in should always become more complex because the child needs to be equipped to deal with them with support from adults or independently over time. The relations between the child's capabilities and the risk situations in the social and material environment, play a key role in children becoming good safety risk assessors. This aligns with Bodrova and Leong's (2007) view of the social relations adapting as the child builds new skills and

competencies, and where a new way of relating to the child becomes necessary. It is argued that when the child manages challenges safely, a new level of trust is gained by the parent, which in turn advances an increased level of independence on the part of the child. The child is perceived to be more responsible because of the way he or she is experiencing and attending to assumed knowledge of safety. The social situation of development of the child has changed and the way of interacting with their social and material world has also changed. It is the style of interaction that will play fundamental role in contributing to a child's holistic development and formulating positive life safety skills. In contrast, bubble-wrapping is a term which represents the situation where children are restricted from activities that lead to healthy risk taking and optimum growth (Malone, 2009). In this reading adult-child interactions could best be described as a collaborative process where parents and teachers provide a supportive structure and learning process that advances the child's ability to develop understandings of risk. A model that captures the nature of shared learning (see O'Neill, 2014, under review) came out of the research on risk assessment (O'Neill, Fleer, Agbenyega, Ozanne-Smith & Urlichs, 2013). This model of practice is briefly illustrated below. The overall study examined the pre and post results of 350 children who were aged between 3 and 6 years, from 11 different preschools, and who participated in a program titled "SeeMore Safety". SeeMore Safety is an early learning intervention program that combines a home support approach to programs delivered in preschools through children's literature and real-life experiences. The program's aim is to improve children's ability to conceptualise safety. SeeMore Safety was used in the studies as a primary resource to examine the effect on children's behaviour and understanding of safe and risk situations as a consequence of participation in an early learning injury prevention program. The studies combined quantitative and qualitative methods which included focus groups, interviews, surveys and pre- and post-intervention tests engaging children, parents and teachers. Results indicated positive outcomes with children demonstrating a significant increase in safety knowledge and reasoning post intervention. What was also evident in the findings was the important role children play in influencing safe behaviours in their parents. Both parents and teachers reported on a consistent pattern of knowledge transfer and safety related behaviour change that occurred in both the children and their parents. What was found was that the program changed the conditions for children's collective learning of risk assessment. The model of shared learning shows the interactive and

dialectical process of co-constructing and developing the new safety learning. This shared learning approach can best be illustrated in Figure 1.

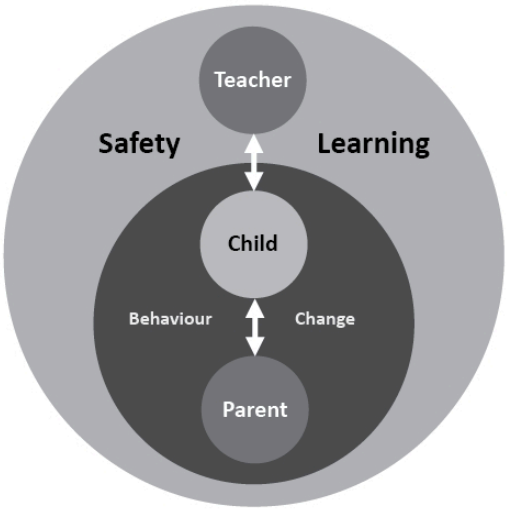


Figure 1. Safety Risk Assessment Model

Here ideal safety learning environment is represented through the outer circle and the inner circle captures the child's real development and understanding of safety as evidenced by her or his behavior. At this point the relations between real (inner circle) development is always conceptualised in the context of the ideal form of development that the teacher is striving to achieve.

The model shows the interrelationship between the children, their parents and teachers and transfer of safety knowledge, where understanding is gained and behavior change occurs at all levels. The child is at the nucleus of the new safety learning process, a foundation for the conceptualisation of "self" as an important agentive dimension within the model. Here the child has agency when the concept of self is shaped by social factors such as interactive experiences with the teachers and parents in consideration of the roles and positions each individual occupies within the learning process (Stetsenko & Arievitch, 2004) as part of the ideal form of development. The model helps conceptualise how the societal and personal issues associated with injury risk can be brought together through a shared learning process. In addition, an acknowledgement of the social situation of development where children have a

risk assessment relationship with their social and material environment best advances a new conceptualisation of safety. This model is used in this paper to support the process of reconceptualising the concept of risk through moving the lens away from a division between the child and the environment, to show the relations between the child and their social and material environment as a dynamic two way process. A cultural-historical conceptualisation of safety risk assessment assumes collective responsibility for shaping childhood safety and injury risk understanding. In the next section, the model is used for examining risk in the community. The case example of Australia is given in order to demonstrate the nature of community conceptions of risk found in the popular press and as illuminated in research. Here risk is conceptualised as individual and static, whereas a cultural-historical conception treats risk as dynamic and relational. The former positions the child as needing to be protected, whilst the latter treats the child as active in their own development of risk assessment.

Risk averse societies - case examples from Australia

The *safety risk assessment model* offers an educational solution to counteract risk aversion often created by influences and tensions between risks and safety in communities. With trends of over regulated and over protective societal change, parents and educators are challenged in providing children with opportunities and experiences important in developing safety and risk capabilities. Due to a number of changes in society and movements in risk thinking, the role of parents in the upbringing of their children has been redefined (Smeyers, 2010). In some cases activities that children have taken part in and benefited from in the past are now often considered to be dangerous. Generational trends suggest children's reduced opportunities for outdoor play are influenced by parental and societal concerns (Brussoni, Olsen, Pike & Sleet, 2012). Extensive research in many fields has been conducted on and with children who represent Generation Z, children born between 1995 and 2009 that occupy places in preschools and schools today. Palmer (2006) argues that children from this era are being deprived of many opportunities and experiences due to perceived dangers and injury risks, coupled by Occupational Health and Safety guidelines, bringing about prohibitions of activities in schools. Brussoni and Olsen (2012) suggest whilst injury prevention plays a key

role in childhood safety, imposing too many restrictions on outdoor risky play opportunities for children, hinders their optimal healthy development.

Public commentary through media has been responsible for bringing attention to prohibitions and play restrictions for safety reasons in Australian childcare centres, pre-schools and schools. 'Childcare centre's ban superheros', reports The Adelaide Advertiser (April 06, 2009) and in the Townsville Bulletin (August 26, 2008). The Townsville school was reported to have banned all forms of gymnastics during breaks, including handstands, somersaults and forward roll. According to Murn (2008), although the Townsville school incident created media attention, it is only one episode of a trend affecting all Australian schools. Murn (2008) recounts the removal of monkey bars in one school, the ban of football and soccer during recess and all games that are deemed "too rough" at another Swings, see-saws, flying foxes and roundabouts are banned from two States within Australia, where NSW and Victorian public schools with playground equipment having to meet strict building guidelines and standards (Murn, 2008). According to Mitchell, Cavanagh and Eager (2006) studies in NSW have demonstrated that previous playground safety standards in Australia (Standards Australia, 1981) have had no significant impact on reducing hospitalisations resulting from playground equipment falls. Although parents are being blamed for bans on some playground equipment due to compensation claims, Murn (2008) believes that these guidelines actually invite litigation and are responsible for encouraging a risk averse culture in educational facilities. The expansion of rules is often influenced by exceptional cases where something has gone terribly wrong and not necessarily a reflective solution for every related issue (Smeyers, 2010).

There is much public debate on activity restrictions at schools and public places for safety reasons, some communities have become proactive in voicing their opinions about such matters. In one community in Australia a public commentary appeared in the Wentworth Courier (2011) reporting on a group of children and their parents from North Bondi who alerted the media when the Waverley Council announced it would remove their community tree house. According to a council spokesperson, the tree house was not compliant with the Australian Standards for Building and Play Equipment and found to be "potentially dangerous". Although several residents had offered to improve the structure to meet safety requirements, it was not an option. A child and family therapist wrote in response to the

article:

As a child and family therapist I see the incredible damage being done to children by fear-filled, over-controlling and over-anxious adults. Of course we have to be mindful of risks and danger but children also have to be exposed to risks in order to learn, through graded experience, how to make good decisions and keep safe. It's unhelpful complaining about risk taking, aggression and mental health problems in adolescents and adults who never had the chance to learn their lessons in childhood (Wentworth Courier, 2011).

It appears challenging environments that children once enjoyed, for instance building cubby houses in trees are often replaced by controlled or semi-controlled environments, such as playgrounds. Mitchell et al. (2006) believe many traditional play areas have been eliminated in current urban environments in the developed world, resulting in reduced opportunities for spontaneous children's play. They argue for many children playgrounds are now the only practical space available for them to play (Mitchell et al, 2006). Whilst playgrounds facilitate valuable experiences for childhood development they are also a common place of childhood injury (Cassell & Clapperton, 2007). Finding a balance between real and other dangers, also between safe play places and degree of managed risk, challenges the parents, educators and creators of play environments to find a common sense approach that is irrespective of practices that prohibit children from activities that are important for their development. Children who are not exposed to risk and have play restrictions placed on them are more likely to encounter problems related to their learning ability, mental and physical health such as obesity (Eager & Little, 2011). According to Mack, Hudson and Thompson (1997) play spaces need to involve some degree of challenge, creativity and stimulation. Brussoni and Olsen (2012) make the point that in seeking strategies for keeping children safe the aim should be "as safe as necessary" rather than as "safe as possible". To introduce a shared learning *safety risk assessment model* means parents and educators can take an active role in working with children to expose them to manageable risks through play and other activities important in safety risk learning.

Opportunities for safely experiencing risks

Through play children learn to manage challenges that are important for their development and for learning life-skills vital for a healthy lifestyle (Mitchell et al, 2006). There is an abundance of evidence to suggest children need opportunities for a range of experiences that allow them to make informed decisions about their capabilities in risk situations (Malone, 2009). Play is an important stimulus for providing these experiences because it is a main activity in childhood, particularly during the preschool period (Karpov, 2003).

Collaborative experiences are important in developing the capabilities children need for independently managing risk. Children need to be provided with guidance in a manner that allows them to have developed safe reasoning so that they are equipped with the competences to do so (Malone, 2009). Adult mediation in children's everyday and play activities provides opportunities for guidance in safe practices and in most cases rules that often govern them. Rules are important because they provide a framework for behaviours, even in play (Vygotsky, 1966). According to Karpov (2003) play is not free of rules, it is governed by play rules created by the participating children in the play in accordance with the roles. However, literature suggests when there are too many rules and over regulation occurs, this restricts activities considered important for childhood development (Malone, 2007; Gill, 2007; Ungar, 2007).

According to Gill (2007) and Mitchell et al. (2006), self-development for independence builds resilience, a sense of self-worth and the capacity to act safety. It has been shown by Ungar (2007) that parents and educators can be proactive in facilitating this by providing good supervision. Good supervision does not mean watching a child but rather through guidance taught skills and provide knowledge that helps them to become responsible risk takers (Gill, 2007). For example in the SeeMore Safety intervention program the children were introduced to 'SeeMore Safety on a walk'. Initiated through literature and animated characters the children were educated on potential risk situations when on an outing. The children were then taken on a walk around their local area with more experienced adults in a manner that allowed the children to be active in constructing environmental knowledge and safety reasoning. This process allows for children's development so they can eventually take on the role to assess their own contexts independently. According to Bodrova and Leong

(2007), it is the social context adapting to the new skills that is responsible for forming the child's growing competencies. Over time parents will gain an increased level of trust in their children's ability, which in turn will bring an increased level of independence and freedom for the child. Independence is gained because the child is perceived to be more responsible due to assumed knowledge of safety. As noted by Vygotsky (1994), the child's attitude and relationship to the environment is central for a child's development, and we argue this is particularly so for the development of risk averse relationship to the environment – acting safely through accurately reading risk situations. Socially and then independently, the child thinks and acts, creating new levels of safety consciousness, which is a source of development in itself.

> Independent play develops resilience, a sense of place, a sense of self-worth, social connectedness and environmental knowledge. Whether it is strolling up to the local shop to buy milk, talking to elderly neighbours or having a tree to watch the world from, these freedoms and privacies to be a child within our local environment help develop important competencies that are drawn on throughout our lives. As environments become more complex, these competencies play a key role in supporting children to become streetwise and good risk assessors. At a time when children need these competencies more than ever, we are limiting their capacity to develop them (Malone, 2009, p. 1).

Whilst it is generally understood that children initially cannot make their own way in life unguided, giving children agency with their everyday challenges and associated risks where genuine threats are understood, provides children with an enriched foundation for building resilience and a safety risk understanding (see Murn, 2008). It appears in many communities children are not getting the experiences and the right amount of risk and responsibility they need. Whilst supervision is critical in the safety of children, equally important is providing children with opportunities that advance new safety learning. Murn (2008) suggests children are missing out on such experiences and "being harassed by the fun police", resulting in long term consequences on their development. This view is supported by Ungar (2007) who argues that adults are keeping children "vacuum-safe", creating a generation of youth who are not prepared for life. He believes in his 20 years of experience of working with troubled youth tells him that often parents consider they give their children everything, but what he thinks they really need are opportunities to experience the responsibility of managing risk for

themselves and others (Ungar, 2007).

Numerous studies have been conducted to indicate that children want to be given the opportunity to be trusted with making decisions about their own safety and assessing risk for themselves (Christensen & Mikkelsen, 2008; Green 1997; O'Neill et al, 2013). Morrongiello and Matheis (2007) argue that many injuries happen during play at a time children are responsible for making their own decisions about safety and risk. Therefore it is in these situations that life and experiences become important teachers. Ungar (2007) suggests that by providing children with opportunities to make mistakes, that they can learn from, even if it means getting a minor injury and teaching them how to stick up for themselves, we will be creating a generation of independent, self-sufficient kids that can manage risk.

A discussion about assessing and managing risks is very much a subjective phenomenon that is beyond the scope of this paper. However, Gill (2007) makes a positive case for risk in childhood and provides four theories: The first is that certain types of risk help children manage those risks, for example safety education initiatives that teach children to swim or ride a bike; the second is based on children having a desire for risk-taking which may expose them to greater risks; the third claims that children are exposed to other benefits as a side-effect of having opportunities to engage in activities that have a degree of risk. For instance the level of risk associated to outdoor play outweighs health and physical development benefits; the final argument in favour of risk is that children build character and personality through risk, overcoming challenges in their everyday lives. It is through risk experiences that children learn to recognise, evaluate and competently negotiate their own course of action that mitigates harm (Christensen & Mikkelsen 2008; Sandseter 2009; O'Neill et al., 2013). Whilst there appears to be much evidence from psychologists and education professionals (Malone 2007; Robbe 2004; Anderson 2010) to support Gill's arguments, it is challenging in most cases to quantify the level of risk verses the benefits. However, in the *safety risk assessment model* the child's conceptualisation of injury risk understanding is a collective responsibility where a more knowledgeable person is engaged in the process, therefore the level of risk is reduced and the benefits enhanced. What is important in providing the right level of risk and responsibility is in the interrelationship between the child, the parents and teachers. This cultural-historical informed model provides a framework for Australian early childhood education to be active in the course of developing competent safety risk managers and to

counteract risk aversion evident in some Australian education settings.

Conclusion

There is a consensus in the views of Gill (2007), Malone (2007), Palmer (2006) Anderson (2010) and Ungar (2007) that reduced independence and play opportunities coupled with growth in adult control has been brought about by parents increased fear of danger. They believe an over protective social change in the Western society has resulted in children being deprived of opportunities and experiences important in shaping childhood safety and risk understanding. These authors point to the need for re-thinking how adults think and act with their children in risk situations. Evidence of such risk averse practices have been coined as "bubble-wrapping" in some Australian communities, as has been reported in public commentary. This suggests a need for reconceptualising community thinking about risk in relation to young children. Many children are missing out on the benefits that come with independent play important in developing resilience, self-worth, social connectedness and environmental and safety knowledge. A common sense approach to balancing risk management is needed if we are to stimulate safety related learning. A cultural-historical reading of risk assessment gives a new way of thinking about the relations between the child and their environment, supporting a new way forward. Reconceptualising risk gives a new framework for education and health. With a new conceptualisation, it becomes possible to see how new types of programs can emerge where the practice models support collective learning of risk – something not routinely contemplated in Australia and many other Western countries. Educational programs where a *safety risk assessment model* is conceptualised as part of the learning experiences of children, rather than a hazard to be avoided, gives a new way forward for the development of curriculum.. The framing of safety messages within the pre-school curriculum during a period where children can engage in a more cognitive orientation to safety provides a foundation for a whole-of-life strategic approach to addressing the child injury problem within the safety and risk landscape. The shared safety learning method offers a collective style of engagement including children, parents and teachers. With such an approach safety messages are more likely to be consistent and real injury risk challenges

better understood. The inclusion of safety learning within the preschool landscape will create new opportunities that allow for a better chance for the next generation to become safety risk aware. The arguments put forward in this paper call for a reconceptualisation of safety risk. Whilst there are challenges in designing sensible injury risk strategies, they should be achieved without creating risk adverse societies.

In conclusion this paper advocates a shared learning philosophy to help counter risk aversion and provide a balance between protecting children from genuine injury risks and giving them challenging opportunities to build competencies. Education through a *safety risk assessment model*, is a very different conceptualisation to that which currently exists - 'bubble-wrapping children'.

References

Andersen, P. (2010). Converting the bubble wrap generation into eco warriors: Results on the effectiveness of a co-signed protocol. *Leading change, living for one planet: 16th biennial conference Australian National University Canberra 26-30 September 2010 - conference journal*. 1-7. AAEE National Conference Committee.

Australian Standard. Playground equipment for parks, schools and domestic use. (1981). AS 1924-1 (1981) General requirements. AS-2 (1981) Design and construction-safety aspects.

Bodrova, E. & Leong, D. (2007). *Tools of the mind. The Vygotskian approach to early childhood education*. New Jersey: Pearson.

Bozhovich, L. I. (2009). The social situation of child development. *Journal of Russian and East European Psychology, 47*, 59-86.

Breivik, G. (1999). *The Quest For Excitement And The Safe Society*. Safety Science Monitor, Special Edition, Philosophy of Safety, 2(3), 52.

Brussoni, M. & Olsen, L. (2012). The perils of overprotective parenting: fathers' perspectives explored. *Child Health Dev. Affiliation: Department of Pediatrics, University of British Columbia School of Population and Public Health, University of British Columbia British Columbia Injury Research & Prevention Unit, and Child & Family Research*

Institute, ePup. Vancouver: John Wiley and Sons. Retrieved from. www.safetylit.org/ week/journalpage.phd?jid=3306

Brussoni, M., Olsen, L., Pike, I. & Sleet, D. (2012). Risky Play and Children's Safety: Balancing Priorities for Optimal Child Development. *International Journal of Environmental Research and Public Health*. ISSN 1660-4601. Retrieved from www.mdpi.com/journal/ijerph.

Cassell, E. & Clapperton, A. (2007). Preventing unintentional injury in Victorian children aged 0-14 years: a call to action. *Hazard Edition No. 65. Melbourne: Victorian Injury Surveillance Unit (VISU),* Monash University Accident Research Centre.

Christensen, P. & Mikkelsen, M. (2008). Jumping off and being careful: Children's strategies of risk management in everyday life. *Sociology of Health & Illness*, *30*(1), 112-130

Eager, D. & Little, H. (2011). Risk Deficit Disorder. In Proceeding of IPWEA International Public Works Conference, Canberra, Australia, 21-24 August 2011.

Fleer, M. (2010). *Early Learning and Development: Cultural historical concepts in play*. New York: Cambridge University Press.

Gill, T. (2007). *No Fear: Growing up in a risk adverse society.* Calouste London: Gulbenkian Foundation.

Karpov, Y. (2003). Vygotsky's doctrine of scientific concepts. Its role for contemporary education. In Kozlin, A., Gindis, B., geyev, S. and Miller, S. *Vygotsky's Educational Theory in Cultural Context*. Cambridge: Cambridge University Press, 65-82.

Mack, M., Hudson, S. & Thompson, D. (1997). *A descriptive analysis of children's playground injuries in the United States 1990 - 4.* Injury Prevention, 3(2), 100-103. Retrieved from www.ncbi.nlm.nih.govJournal List›InjPrev›v.6(2).

Malone, K. (2007). The bubble-wrap generation: children growing up in walled gardens. *Environmental Education Research*, *13*(4), 513-527.

Malone. K. (2009). Designs for a child-friendly city. *Curriculum Leadership An electronic journal for leaders in Education,* 7(2), 1. Retrieved from www.curriculum.edu.au/ leader/designsforachild,26559.html?issueID=11718.

Mitchell, R., Cavanagh, M & Eager, D. (2006). Not all risk is bad, playgrounds as a learning environment for children. *International Journal of Injury Control and Safety Promotion*, NSW: Taylor & Francis Group,13(2), 122-124.

Morrongiello, B. & Matheis, S. (2007). *Understanding Children's Injury-risk Behaviors: The Independent Contributions of Cognitions and Emotions*. Psychology Department, University of Guelph.

Murn, C. (2008). *Your child is a wuss.* Institute of Public Affairs. IPA Review November 2008. 37. Retrieved from https://ipa.org.au/library/publication/1224631145_document_60-5_murn.pdf

National Public Health Partnership (NPHP). (2004). *Canberra: The National Injury Prevention and Safety Promotion Plan: 2004-2014*.

O'Neill, S. (2014). *A CHILD'S VOICE: Shared early learning programs that empower children to influence positive safety behaviour in adults*. (Under review). Monash University, Melbourne

O'Neill, S., Fleer, M., Agbenyega, J., Ozanne-Smith, J. and Urlichs, M. (2013). Developing effective safety education programs for children: Findings from 'Seemore Safety', the Pilot Study. *Australasian Journal of Early Childhood*. ACT: DEST 38(2), 74-84.

Palmer, S. (2006). *Toxic Childhood. How the modern world is damaging our children and what we can do about it.* London: Orion

Robbé, F. (2004). *Designing for delight: Creative playground solutions, no matter what!* Paper presented at the Kidsafe National Playground Conference, 22-24 March, 2004. Sydney.

Sandseter, E (2009). *Risky play and risk management in Norwegian preschools-A qualitative observational study*. Safety Sci. Monitor, (13) 1-12.

Smeyers, P. (2010). *Child-rearing in the 'risk' society.* On the discourse of rights and the 'best interests of a child'. Educational Theory, 60(3), 271-284.

Stetsenko, A., & Arievitch, I. M. (2004). Vygotskian collaborative project of social transformation: History, politics, and practice in knowledge construction. *The International Journal of Critical Psychology, 12*(4), 58-80.

The Advertiser, (2009). *Childcare centres ban superheros*. 6 April 2009. Adelaide. Retrieved from http://www.adelaidenow.com.au/news/childcare-centres-ban-superheros/story-e6freo8c-1225698502212?nk=0e8f100d14a38249081d78b0c4515a04

The Townsville Bulletin. (2008*). What a flippin joke - Townsville school becomes cartwheel cops.* 26 August. Townsville. In Murn, C. (2008). *Your child is a wuss.* Institute of

Public Affairs. IPA Review November 2008. 37. Retrieved from https://ipa.org.au/library/publication/1224631145_document_60-5_murn.pdf

Ungar, M. (2007). *Too safe for their own good: how risk and responsibility help teens thrive*. Crows Nest: Allen & Unwin. 20.

Vygotsky, L. (1934). §14. The problem of the environment. The Vygotsky Reader, pp. 338-354, ed. Rene van der Veer and Jaan Valsiner. In The fourth lecture published in Vygotsky, L. S. 1935: *Foundations of Paedology*. 58-78.

Vygotsky, L.S. (1966). *Play and its role in the mental development of the child.* Voprosy psikhologii*,* 12, 62-76.

Vygotsky, L. (1987). *Thinking and speech*. In L.S. Vygotsky, The collective works of L.S Vygotsky, Vol.1, R.W. Rieber and A.S. Carton (eds), N. Minick (trans.). New York: Plenum Press, 39-285.

Vygotsky, L. (1994). *The problem with the environment*. In R. van der Veer & J. Valsiner (Eds.) The Vygotsky Reader, Oxford: Blackwell, 338-354.

Wentworth Courier. (2011). *Council to scrap community tree house.* 26 January 2011. Wentworth. Retrieved from http://wentworth-courier.whereilive.com.au/news/story/north-bondi-tree-house-saved/

World Health Organization (WHO) and UNICEF (2008). Peden, M., Oyegbite,K., Ozanne-Smith,J., Hyder, A., Branche, C., Rahman, F., Rivara, F and Bartolomeos, K (EDs). *World report on child injury prevention*. Geneva: WHO Press.

Chapter 10

Conclusion

Introduction

The outcomes of an intervention study framed from the culturally and historically designed safety education program called "SeeMore Safety" established reason to believe in a "collective risk intelligence" form of safety-related capacity building that positively contributes to children's behaviour and reasoning about safety.

A notable gap in the literature was identified and the findings of the study have shown that children from a young age can have agency in their safety learning. A review of the resources and injury prevention programs that are designed for preschool children were found to be limited, and it was noted that they were more topic specific rather than holistic in nature. For instance, there were only two programs that preschools had mentioned that they had participated in. They were "Thingle Toodle", a road safety program, and "Responsible Pet Handling", a program dealing with children's behaviour around pets. Most programs were generally targeted at parents, where the children tended to be passive recipients in the education process. The concept of a program centred around children's collective risk intelligence appeared absent. For this reason, the SeeMore Safety program was used in the study as an intervention to provide children with learning opportunities and experiences concerning safety, which were then examined to determine their effect, if any, on changing children's behaviour and reasoning about safety.

Due to the fact that the researcher was responsible for designing the program content and new testing instruments, it was considered prudent to conduct a pilot study to identify their suitability and reliability.

To ensure there was no bias in the pilot study process, the Geelong City Council was engaged to conduct the pilot study through its "SafeStart" program. In brief, the feedback provided by the teachers identified that the program's safety content was suitable and effective for preschool children (refer Chapter 4). Teachers and parents reported on the children's new safety knowledge and increase in safety risk understanding. Their conclusions were consistent with the children's test results, which demonstrated an increase in scores from the tests conducted pre-intervention to those

conducted post-intervention. Based on these findings, it was decided to use the SeeMore Safety program as the primary resource and to use the new testing instruments to collect the data in the main study.

Collectively, the pilot and main studies investigated a total of 500 preschool children, 236 parents and 15 preschools over a 20- to 28-week period to show that children can have agency in their safety learning when they are active recipients. Detailed accounts of the pilot and main studies can be found in chapters 4 and 5. Theoretical perspectives of Vygotsky (1929), Leontiev (1964), Elkonin (1972), Kozulin (1990) and Zaporozhets (1997) that promote learning through interaction with others, where individual perspectives are considered and valued, were used to underpin the principles of this intervention program's content and study design. The program encouraged partnerships between teachers, children, their parents and families to enhance the ability for safety-related learning to be more effective. Initiated in the preschool, the teacher guided the children through the safety-learning process, which was then enhanced at home by parent participation in co-constructing meaning with their children through the take-home resources.

Quantitative and qualitative methods used to examine the effects of the culturally and historically informed SeeMore Safety preschool safety intervention program revealed positive outcomes. As indicated in chapters 4 and 5, the quantitative methods used in the pilot and main studies demonstrated that the pre-intervention test scores compared with the post-intervention test scores of the children from the intervention groups improved considerably. Consistent with the children's test results, the parent scores also revealed an increase when the post-intervention results were compared the pre-intervention results.

A major difference between the main study and the pilot study was that one of the aims of the main study was to determine whether the SeeMore Safety program was more effective than conventional approaches to enhancing children's safety knowledge and understanding. To this end, the main study included a group of preschools (comparison group) that did not participate in the intervention program to act as a control group in order to be able to compare the differences, if any, in the safety knowledge and understanding of the children who participated in the intervention program with the safety knowledge and understanding of children who did not.

The results from the pre-intervention and post-intervention tests undertaken by the children and their parents in the intervention group established that the children from the intervention preschools demonstrated a significant increase in safety knowledge and reasoning when compared to that of the

children from the comparison preschools. The children from the intervention group demonstrated an average increase of 18.8% from pre- to post-intervention scores, whereas the average increase in the scores of the children from the comparison group was 1.2% from pre- to post-intervention. This indicates that the learning was advanced through participation in the intervention program, suggesting that the improved safety learning was due to more than a maturation developmental process.

As discussed in chapters 1, 2 and 8, the long-held views about education and child injury have prevailed in establishing measures for classifying childhood development and childhood injuries. Rather than the age of the child being the guiding principle which positions development from a maturational and biological view, the main study's findings are more favourable to a perspective grounded in a cultural-historical theory. In this context, the child's relationship to their social and material worlds is instrumental in shaping safety learning and is developed through interaction with others (Vygotsky, 1987). It appears that the higher level of internalised conscious thought that is required by an individual to comprehend safety and risk understanding cannot be gained by maturation alone.

Whilst the quantitative data provided evidence of a significantly higher increase in the post-intervention scores of the children from the intervention group, qualitative data revealed the depth and significance of changes in children's understanding of safety and injury risk.

The following section discusses the study findings (inclusive of both pilot and main) which have been arrived at through adopting a cultural-historical perspective to understand the way children learn and interact in their environment in order to manage personal safety risks. This concluding chapter is presented in a way that the hypotheses of the study and the research questions are addressed.

How Do Preschool Children Perceive Safety, and Safe and Unsafe Situations?

Qualitative and quantitative data collected through focus groups, questionnaires and informal interviews provided valuable information on the children's understanding of safe and unsafe terminology. In the main study pre-intervention, the children referenced words such as "bad" or "naughty" to describe unsafe. This terminology was used by 58 children in the intervention group and by 48 in the comparison group. After repeating the same exercise with the same children in each group post-intervention, findings revealed trends of changes in terminology. Within the intervention

group of children, “bad” and “naughty” were replaced with “hurt” on 50 occasions, whilst from the comparison group, only three children changed their terminology.

This pattern of word usage was also reflected in the camera activity. Disposable cameras were provided to four children selected from each preschool in the intervention and comparison groups participating in the main study. The children were asked to photograph safe and unsafe images in and around their homes. Both groups provided a variety of images that became the focus of the discussions in the small groups post-intervention. Whilst all the children were able to give meaning to the scenarios presented, the terminology used in the intervention group reflected a more in-depth understanding. For instance, during class activities, the teachers noted new terms appearing such as “you could get hurt” and “dangerous”. On one occasion, the teacher asked the children how their visits to their new school went, and one little boy replied, “I felt unsafe” (PreSP 6). In this example, the effect the social and environmental relationship has on the child’s development is evident, influenced by the child’s emotional experience in the environment (Vygotsky, 1934).

Vygotsky (1987) describes this relationship as “the social situation of development”. (Discussed in more detail in chapters 1, 2 and 7.) However, the same environmental situation may have had a different effect on the child’s development if the child’s perception and prior experiences were changed. For example, if the child had previously visited that school and met the teacher, the emotional experience may have been different. This child associated “unsafe” with his emotions relating to visiting an unfamiliar social and physical environment. Therefore in determining the meaning of “safe” or “unsafe”, the child’s individual experiences and characteristics have influenced the child’s attitude to the given situation, taking into account the emotions experienced in context of the child’s safety. This means the emotional experience unites the environmental and personal characteristics that affect the psychological development of the child (Vygotsky, 1934). Each child’s perceptions will therefore be entirely different, retained in their consciousness in a manner that is reflective of the associated emotional experience.

In Chapter 8, Figure 8.1 (O’Neill, 2015, under review) provides an example where a child swings across the monkey bars and reaches the other side with a sense of satisfaction. However, a child attempting the same activity who falls may find the experience painful. For this child, the activity will have a completely different meaning and the child will experience an entirely different emotion. This child will perceive the activity to have a far greater risk of injury than the first due to their prior experiences. What a child brings to a situation at any given point of time will change based on the

child's relationship to the environment from the last experience. Therefore the emotions the child experiences in the same environment may be entirely different to the previous time when the child had been in that situation.

It can be argued that if emotions are considered significant in a child's development, it is the child who is critical in the safety-learning process because their personal emotions related to situations influence their development. Taking a cultural-historical view of child development, where the child's perspective is shaped by the child's social, physical and emotional worlds, signifies the importance of the learner's contributions. In this context, the child is active in the safety-learning process and is a valid participant in safety reasoning. Therefore the child has agency in changing practices and giving meaning to their own safety, taking ownership in the safety-learning process. The child's ability to connect safety perceptions to situations within their environment and recognise whether the situation is safe or unsafe becomes a source of self-development.

Do Children Gain Greater Safety Awareness, Knowledge and Skills from the SeeMore Safety Program, if Any, Compared with General Preschool Safety Education Programs?

It is difficult to ascertain whether the SeeMore Safety program was solely responsible for the children participating in the intervention group gaining greater safety awareness, knowledge and problem-solving skills than the comparison group. As well as delivering its own education program that broadly covers many areas of safety, the SeeMore Safety program also promotes and encourages preschools to incorporate other safety education resources and programs that complement the topics covered in SeeMore Safety. Programs such as "Sun Smart", "Responsible Pet Handling" and "Thingle Toodle" could also have played an important role in increasing safety knowledge and understanding related to those particular topics. During the testing period, two of the four comparison preschools commented on engaging in other formal safety education programs. The programs included Thingle Toodle, and Responsible Pet Handling. The teachers reported on behaviour change and knowledge gained in reference to safety-related understanding associated with those programs. For instance, the comment: "They discuss Thingle Toodle and comment on road safety" (PreSM 5). These two preschools that had participated in other safety education programs during the intervention period produced slightly greater post-intervention scores than pre-intervention scores in comparison to the two preschools that did not participate in any formal programs (refer Chapter 5). This suggests that intervention programs overall can be effective in increasing children's safety knowledge.

There were common elements in the positive feedback from both the teachers and parents with regard to the resources provided by the SeeMore Safety program that would not necessarily be found in conventional safety education programs. Detailed information relating to the SeeMore Safety Resource Kit can be found in Chapter 3. The kits contain a teachers' guide, a mascot doll, a CD and a series of children's picture books, a class set of A4 books that the teachers present to the children, and smaller A5 versions of these books for the children to take home and share with their families.

Parents' and teachers' comments were directed towards the books. One teacher commented that "The children love the books and have ownership of them to teach other family members" (PreSM 3). Another teacher reported that the take-home picture books were "absolutely beneficial, as the program can be supported by parents and families" (PreSM 4). Parents also made reference to younger siblings of the participating children benefitting from the books and take-home activities (see chapters 4 and 5).

Figure 10.1. Child sharing new learning with siblings.

In addition to the formal safety education program content, both the pilot and main studies' intervention groups engaged in other activities related to safety to complement the SeeMore Safety program. Play corners were set up to represent themes presented in the books. For instance, in one preschool, the home corner featured safety items such as stove guards, demonstrating the safety practices depicted in the SeeMore Safety books. Other preschools set up play areas that represented

a car, where children were required to put on their safety belts. Children were also taken on excursions where they practised crossing at traffic lights and using pedestrian and school crossings. Several preschools held a bike safety day and encouraged healthy eating habits.

It was common practice in all intervention preschools that safety themes first introduced to the children through animated images in the books, posters and activities, then appeared in real-life situations through play and teacher-directed activities. One activity included photographs on safe and unsafe practices taken by the children on a disposable camera and brought to the preschool to be shared with the other children. Many of the photographs were inspired by the animated pictures featured in the books, for example:

Figure 10.2. Animated safe image.

Figure 10.3. Real-life safe image.

Figure 10.2 is a card depicting an animated picture of a child wearing a seatbelt that corresponds to the safe image in Figure 10.3. The children were asked to comment on safety aspects of the pictures on the cards. The children were able to demonstrate conceptual understanding of the relationship between the animated pictures and real-life photos to connect imaginary situations with realistic thinking.

In these scenarios, Vygotsky's (1994) concept of ideal and real situations is demonstrated, and is explained in detail in chapters 2, 7 and 8. Children were required to participate in activities that

allowed them to draw on their new knowledge gained from the SeeMore Safety program and apply responsible risk management understanding to real-life situations. To do this requires a higher level of conscious thought and advanced form of thinking, which was noted by teachers in the children's play-based and role-playing activities where imaginary situations aligned with realistic thinking.

For example, in one preschool a crossing was created in the playground where children were able to demonstrate responsible road safety practices (PreSM 3), which is an extension of the walk-themed book. The teacher then took the children on a walk to practise crossing the road at designated pedestrian crossings and where there were traffic lights. The learning situation advanced from animated images to imaginary play and real-life learning through teacher-guided activities. What is important in this context is that a child's safety understanding is developed in collaboration with the teacher due to the fact that the knowledge that needs to be gained for the level of risk associated with the particular activity is greater than what the child could achieve independently.

Consistent with Vygotsky's (1962) "understanding between minds" described in Chapter 6, the more knowledgeable person can advance the learner into what Vygostsky terms as their "zone of proximal development" (ZPD). The ZPD represents what can be achieved by the child with assistance compared to what the child can achieve without assistance (Chaikin & Lave, 1996). In relation to safety learning, the ZPD is particularly important because the level of risk associated with injury is high and requires the guidance of a more capable person with good safety knowledge. As shown in Figure 6.2 in Chapter 6, the children are taking an active role in the learning process, collaborating with the more knowledgeable person to extend their learning beyond what they can do alone. In this example, the conceptualisation of safety risk is gained through experience and practice guided by a more capable person. Vygotsky's (1994) concept of a dialectical relation between the ideal and the real situation, or form of development, where the interaction the child has with their social and material worlds is apparent in the road-crossing activity. The relationship the child has with the crossing in collaboration with the more knowledgeable person is important in the child's development because it allows the child to participate in meaningful communication to advance their learning.

All preschool teachers and parents commented on the changes they had witnessed in the children's behaviour in relation to road safety. In one preschool (PreSP4), a grandmother was responsible for walking her twin grandchildren to preschool, which she did so on a restraint. At the conclusion of the program, the grandmother commented that the children's positive safety behaviour and

capabilities of self-regulation no longer required them to be restrained. This suggests that the children were aware of safe practices in that environment. In this situation, the children are recognised as active participants in the learning process and are productive in their building of a sense of self as valid participants in safe reasoning, which is an example of cultural-historical theory incorporated within post-structural theory of child development.

Is the SeeMore Safety Program Effective in Changing Children's Safety Perceptions and Behaviours?

Evidence gathered from the quantitative and qualitative data in the main study gave reason to assume the SeeMore Safety program was effective in changing children's safety perceptions and behaviours. The change in the children's safety perceptions between the pre- and post-intervention periods, which was discussed previously, was evident and highlighted the significance of a child's social, physical and emotional worlds in the process. The example of the grandmother and twins acting safely within the road environment demonstrates positive behaviour change and the connection the children's perceptions of safe and unsafe made with that environment. As discussed in Chapter 8, an increased level of trust in the children's ability was gained by the grandmother who, in turn, gave them an increased level of independence. With a new level of trust and independence, the social position of the children's relationship with their grandmother in that environment changed. The position children occupy within the scheme of social relationships is conceptualised in Bozhovich's (2009) work, which is discussed in more depth in chapters 2, 7 and 8. As a result of the safety knowledge gained by the children, they were perceived by their grandmother to be more responsible and capable of thinking and acting in a safe manner walking to preschool. The new levels of safety consciousness and independence gained by the children were important in developing their competencies as their future learning will progress in an entirely different and meaningful manner compared to the direction it would have taken had they continued to be restrained.

In general, parents commented on the benefits they had gained from the behaviour change they had witnessed in their children, like the grandmother saw in the twins. This change, in turn, gave children opportunities to put into practice their new safety knowledge in everyday activities. Many parents commented on their children's behaviour changes in the car. For instance, one parent commented on her daughter previously misbehaving in the car and that the program had been beneficial in dealing with this issue, in particular not distracting the driver. Other parents noted that the children were more accepting of using their car restraints. In many cases, the children were

initiating the act of fastening the seatbelt, reinforcing the sense of "self" as important in the safety practice.

A common trend to emerge from the program was both teachers and parents noting the change in behaviour of the children in the study as well as that of other family members. The study found children were active in transforming family practices and understandings about safety and played an important role in encouraging safe behaviours in their parents. This alters the notion of pure psychological perspectives of behaviour change to a more socio-psychological perspective, where social and cultural variables are responsible for adopting new safe behaviours, and is discussed in Chapter 6. There is shared influence between the children and their parents, which complements the belief that theories of behavioural change are effective when understood within a socio-cultural realm.

A situation was noted by a teacher who commented on a father who transported his son to preschool on the back of his bike with neither of them wearing helmets. Towards the end of the program, both the child and father were wearing helmets. The teacher believed that the purchase of a helmet was not previously a priority for the father; however, the intervention program may have changed his perception of what is important. Many families made changes to their safety practices within their home environment. Such changes included the mandatory wearing of helmets when riding bikes and skates. Another parent reported on changing the storage of helmets to where the children could reach them, giving them agency in putting safety practices in place. One family collaboratively designed an evacuation plan whilst others included safety discussions in their daily interactions, commenting that "we talk about issues that arise on a daily basis; we point out the safe way to do different things" (PreSP 1). Another parent commented that "not only has my son changed his behaviour, but our family is more safety conscious" (PreSM 1).

These examples highlight changes families had made to their practices within their home environments to improve safety. Parents also made reference to their children sharing new safety knowledge with other family members. For instance: "He has come home from kinder and discussed in detail with his older and younger siblings safety with SeeMore" (PreSP 5).

The children also commented on roles they had played in changing behaviours and passing on relevant safety messages to their parents. For instance: "My dad talks on the mobile phone and I tell him, 'no, you don't talk on the phone when you are driving; that's what SeeMore says'" (PreSM 1). Another parent wrote: "Behaviour in the car has improved and we are not allowed to answer the

phone in the car" (PreSM 1). Common trends among children's comments related to car restraints, parents talking on mobile phones and bike helmets.

Parents and teachers were asked to comment on any behaviours they had noted in the children towards safety in their play and social interaction with other children. Teachers provided detailed accounts of children's play activities, where they had witnessed elements of safety learning as presented in chapters 4 and 5. The teachers made reference to the safety focus evident in the children's play activities – for example, the fire truck play corner discussed in Chapter 5 (PreSM 1).

Figure 5.3 in Chapter 5 shows results from the parent SKSB Checklist following intervention, where positive changes in children's risk-taking behaviours and increased safety knowledge were recorded. The study findings indicated a consistent pattern of increased scores for both children and their parents after taking the pre-intervention tests and post-intervention tests.

Safety Education Programs Designed for Preschool Children Can Provide a Foundation for Children to Develop an Integrated Understanding of Safety and How to Recognise, Analyse and Respond to Potential Injury Risk Situations

Previous chapters have highlighted how education and experiences in the early years significantly contribute to children's lifelong learning abilities and achievements. The most effective approach is where the relationship between a child's home and educational experiences are consistent (McLachlan et al., 2010). In this context, the shared learning is a collaborative process between children, parents, and teachers (Fleer & Williams-Kennedy, 2002; Victorian Curriculum and Assessment Authority, 2008) where each individual's roles are respectfully considered. This approach within the safety context allows for a partnership, where sharing of safety knowledge, messages and practices are more likely to be consistent. Forming partnerships with parents and families in early childhood education settings promotes positive role-modelling opportunities. Literature shows that within the safety context, children imitate behaviours demonstrated by their parents (Victorian Curriculum and Assessment Authority, 2008), which can be both positive and negative safety behaviours (Quaraishi et al., 2005). Consequently, reinforcing the concept of understanding between minds (Vygotsky, 1962), as discussed in Chapter 6, matters.

Findings from the pilot and main studies suggest children can also be positive role models for their parents (refer chapters 4 to 6). These findings have been supported by other studies such as the American National Fire Protection Association's (NFPA) "Learn Not to Burn" (LNTB) fire safety intervention program, where 73% of parents reported their children had influenced safe practices

within their homes following participation in the program (Johnson, 2007). Previous chapters have highlighted safety knowledge and comprehension gained through participation in early learning injury prevention programs where children have had a positive impact on the safety practices of others. Transforming family practices and understandings about safety through this collaborative process suggests early childhood education can play a significant role in injury prevention strategies.

Engaging parents in the education system can sometimes be quite challenging. However, qualitative data collected from the studies showed that in the case of the SeeMore Safety program, the parents and children felt supported and empowered in their safety learning. Teachers from both the pilot and main studies commented on the high level of participation of the parents from intervention group preschools, which in some centres was unusual. This may have been due to the fact that the resources the children took home were provided free of charge. The other contributing factor may have been the information nights that were arranged for the parents, which provided guidance on the role parents could play in the learning process. The interactive nature of the program within the preschool environment also provided parents with the opportunity to be informed on the most up-to-date safety-related knowledge, practices and resources available.

The structure of the program ensures the consistency of its safety messages eliminates the potential gaps that can appear when children's learning at home differs considerably from the learning that takes place in the preschool setting. This concept, described by Wise and Sanson (2000) as "dual socialisation", occurs when the child's experiences at home conflict with their experiences in educational settings (as cited in McLachlan et al., 2010). An example of this was previously discussed in Chapter 4, where a father transported his son to preschool on the back of his bike with neither of them wearing helmets. The importance of wearing a helmet was introduced in the bike safety component of the SeeMore Safety program. In this example, the son's safety messages and practices at home differed from the messages and experiences he received in the preschool setting. At this point, the social and cultural variables are emphasised in the new safe learning. Identifying influential factors affecting the parent's intentions and behaviours become important in the process of aligning the new learning between the preschool and home settings. In the bike example quoted earlier, sometime later, the father and son both wore helmets. However, the opportunity to investigate the factors contributing to the behaviour change was not readily available.

The effectiveness of an approach that encourages behaviour change in one person which then influences the behaviour of another, may be due to the individual's readiness to change a behaviour.

This may have been the case in the bike example with the father and son. However, it does suggest that theories of behavioural change conceptualised within a socio-cultural structure can be effective within the safety context when there is shared influence between the child and adult as noted in Chapter 4.

Incorporating safety-related shared-learning programs within the early childhood curriculum, where the children's learning is supported and extended by their parents at home in everyday experiences, is advantageous. The significance of consistency in the safety concept formation process means all sources are working together to contribute to the child's safety learning in an environmental structure that is critical to the process. The social environment of the preschool provides opportunities for parents to be included in a safety education program structure. This multi-sectoral approach to safety appreciates the established human and institutional capacity in the process where parents and children are given agency and feel supported.

As discussed earlier, the relationship between a child's intentions and actions changes during the preschool years and therefore it is opportune to introduce safety-related learning at this time within a more formalised structure. Chapters 6 and 8 draw attention to Bodrova and Leong's (2007) theories on a child's capabilities to carry out and self-regulate complex processes and functions, where deliberate, mediated and internalised behaviours are gained through learning. Bodrova and Leong (2007) suggest that towards the end of kindergarten, young children should be capable of self-regulation. Coinciding a period of childhood development where self-regulation occurs with an education practice model that encourages child–adult interaction can be timely and effective in the conceptualisation of safety. The concept of self-regulation, where the child thinks first and then acts with intent, foregrounds the underlying principle that the concept of safety is a skill that can be developed. This notion further strengthens the motivation to explore opportunities for a safety risk intelligence model to be included in the early years' learning curriculum framework. These concepts are further explored in the next section.

Safety Is a Skill That Through Everyday Life Experiences Linked to Curriculum Resources and Programs Can Be Developed to Enhance Children's Ability to Manage Decisions about Their Own Safety and Others

The second hypothesis being tested in the study is that safety is considered a skill that has evolved into a more advanced form of thinking than originally thought. In this section, it is suggested that whilst the term skill, as meaning the gaining of knowledge to form abilities, is fitting, there is a

deeper meaning relating to concept formation of risk intelligence that can develop to provide individuals with the capability to appraise risk of injury and make informed decisions about their own safety and others.

Building children's competencies to enable them to conceptualise safety and risk within a process that considers the intricacies of a multi-sectoral approach to safety appreciates the established human and institutional capacity. Vygotsky's (1934) theories on the major accomplishments in the preschool child's development have been discussed in previous chapters. Concepts of self-regulation, the integration of emotions and cognitions, and the child's social situation of development inform how safety can be conceptualised. It has already been argued that Bodrova and Leong's (2007) theory of self-regulation occurs towards the end of the preschool/kindergarten years. Their conclusions were supported by the findings of the pilot and main studies, which suggest that the preschool period is the right time to commence the process of safety risk analysis. In understanding a child's growing safety competencies, the concept of self-regulation is significant. The optimal developmental outcome of safety-related learning is that the child gains independence in managing the risk of injury in later life by demonstrating positive safe behaviours. As discussed previously, this is manifested by the internalisation of more advanced mental tools that help children to master their own behaviour (Bodrova & Leong, 2007; Kozulin et al., 2003).

The study found that what each child brought to the preschools with regard to their perception of safety was quite similar, where unsafe was perceived to be an act of naughty or bad behaviour. However, it was the children's social, physical and emotional experiences that were quite varied. For some of the children, attending preschool was the first time they had been independent from their parents. Others had been in day care for a number of years prior to attending preschool. Parenting styles were diverse, with some parents allowing their children to engage in activities with higher levels of risk whilst others showed over-protective tendencies. Each child came with wide-ranging levels of independence and social skills and therefore experienced the new situation differently. Consequently, it was important that the intervention program cater for the established individual's capabilities within the context of the educational setting. For this reason, Vygotsky's wholeness approach to understanding the child's development in relation to the child's social situation matters (Fleer, 2010). Conceptualising together the individual's development in context with the kinds of activities and institutional practices the child engages in (Rogoff, 2003) was theorised in this study. The cultural-historical grounding of the SeeMore Safety program encourages

a style of interaction where there is an understanding between the teachers, parents and children, and that the children's views matter.

The safety risk assessment model detailed in Chapter 7 captures the interrelationship between the children, parents and teachers as a transfer of safety knowledge. The model shows the interactive and dialectical process where the co-construction and development of safety knowledge and understanding is gained. In this context, the child is central to the new safety-learning process, building on the concept of self as a foundation for the child having agency in their safety learning. This process has been shown throughout the previous chapters to be fundamental in formulating a child's safety conceptualisation.

The intervention program provides experiences for children to explore their social and material worlds in a way that fosters their capacities to develop the safety risk understanding and competencies they need to become responsible risk-takers. It is argued that such programs that consider the wholeness of the child can direct children in the development of what has evolved into the concept of *safety risk intelligence*.

Culture and Safety Education Programs

Chapter 4 highlighted the significance of appreciating cultural understanding in designing safety education programs. One particular study discussed in Chapter 4, which involved a mixture of single-parent, two-parent and blended families with multiple combinations of first, second and third generation immigrants, questioned the effectiveness of traditional preschool safety education programs in such a setting, where police and fire services were engaged to deliver safety messages (Saltmarsh, 2010). Given the culturally diverse mix of the group, using police and fire services to introduce the topic of safety was found to be problematic. In this scenario, the children were disturbed by the officers wearing uniforms and being in positions of authority, which led to the safety programs being ineffective. However, using police and fire services in delivering safety knowledge has been found to be extremely successful in other programs and has been responsible for saving lives (Johnson, 2007).

This suggests that what is important in providing an effective method is the understanding of the child's development in relation to the child's cultural and social situations. An approach that provides flexibility to cater for the complexities of cultural diversity may be as simple as the police and firefighters first engaging with the children in plain clothes in a way that acknowledges the

children as legitimate participants in the safety learning. In this situation, the power of the relationship in social interactions is recognised as engaging rather than distressing. The children's prior experiences with adults in uniform or in positions of authority may have influenced their perception of the situation. To understand the children's situation and the effect it has on their development, their perceptions and prior experiences must be appreciated. It is the children's emotional experience of prior environmental situations that will have influenced their understanding of the current situation (Vygotsky, 1934). In the example of the migrants receiving the safety education program, it is likely that the children may have been exposed to authorities during the migration process. Therefore, their prior emotional experiences that are imprinted in their consciousness have determined their perception of the situation, with each child reacting in an entirely different way. The multicultural context of the classroom of more recent times has led to educational institutions becoming more responsive to cultural diversity (Kozulin et al., 2003). It is for this reason that a cultural-historical view of child development in safety conceptualisation is significant because the whole child is considered in the learning process.

Emotional significance. Chapter 1 highlighted the many factors that influence children's injury risk-taking and safety conceptualisation. The study findings also drew attention to the significance of emotions and the important role they play in influencing safety reasoning. An example of emotions guiding the conceptualisation of safety was evident in the pilot study, where during a class discussion, the teacher asked the children about their visits to the schools they would be attending in the new year. As discussed earlier, one little boy replied that he felt "unsafe" (PreSP 6). To this child, his understanding of unsafe had an emotional connection, where he was uncomfortable in unfamiliar surroundings. The child's use of language to transform his perceptions and thinking on "unsafe" in this way suggests he was able to make sense and meaning of "unsafe", a significant development in itself. This is representative of Vygotsky's (1934) claim of the unity of emotion and cognition within the child's social situation.

Identity of self. The importance of having an inclusive structure around children's safety education where teachers, parents and children are part of the approach is discussed throughout the chapters. Within the process is the construction of identity of self where the aim is that the child becomes capable of self-regulation, of having the capability to act in a deliberate and planned manner (Bodrova & Leong, 2007). In the context of safety, the child's intentions and subsequent actions highlight risk appraisal conceptualisation. The underlying principle is that the child thinks about the situation and level of risk associated with it and then acts in an informed manner. This process is

grounded on prior experiences, knowledge, self-awareness and understanding that the child has of their own safety and capabilities.

In the SeeMore Safety program, the children have agency in transforming their own practices, taking ownership in the safety-learning process. Children acting in an informed manner to manage their safety-related behaviour was demonstrated by the many examples discussed in chapters 4 to 6. For instance, the situation discussed earlier of the grandmother who, prior to the intervention, walked her twin grandchildren to preschool with both of them wearing harnesses to prevent them running away. Towards the end of the program, the children demonstrated a behaviour change that gave the grandmother confidence in their capabilities to manage risk situations and act in a more responsible manner. Consequently, the harnesses were removed. As a result of the new skills and competencies gained by the children, the grandmother had developed a new level of trust, which gave the children increased independence over time. In this example, the children were perceived to be more responsible because of their behaviour change and assumed knowledge of safety.

From a cultural-historical perspective of risk appraisal, the tasks the children engaged in became more challenging until they were equipped to deal with them independently. The children having agency for acting safely with understanding emphasises their sense of self as valid participants in safety reasoning.

Reading safety and risk. In the intervention program, the children consciously engaged in reading safety and injury risk through a dialectical relation. An example to illustrate this interaction is the case between the more knowledgeable child and the other child participating in the bike safety activities. One child had selected an inappropriate-sized bike, which the more knowledgeable child had pointed out to her. She explained that the bike was too big for her, which could cause her to fall off and hurt herself (PreSP 1). The significance of the social context of the shared-learning process is recognised in this example where the children are psychologically aware and engaged, collaboratively co-constructing the new learning. The more knowledgeable child drew upon her new learning to share knowledge about the situation that presented itself in the bike activity. This process saw the more capable child supporting the other child in her development to reach new levels of comprehension. This was demonstrated by the children moving to the line of bikes where together they selected a more suitable one that was smaller in size. To recognise an injury risk with the knowledge of body–object relationship is a sign of psychological significance in safety reasoning.

This level of safety understanding positions the child to have agency in the particular situation and be influential in the learning of others.

Another example of safety-related conceptual understanding was noted during a children's small focus group session where a series of photographs were used (refer figures 8.4, 8.5 and 8.6 in Chapter 8). The first photograph depicted a child not wearing a helmet, the second had a child wearing a helmet but the straps were not done up, and the third had a child wearing a helmet with the straps secured. The four children engaged in the focus group session equally contributed in navigating the conversation to conclude that the first photo was unsafe because the child in the photo was not wearing a helmet. The second photo was also considered unsafe due to the fact that "the helmet is undone and it could fall off" (PreSM 1). The third photo depicted a safe situation because the helmet was done up. A source of development is recognised in this scenario in that the children in their dialectical relations were able to conceptualise the situation or acts presented in the photographs as being safe or unsafe. The safety awareness element of the activity was at a higher level of thinking and a more advanced level of motor skill and cognitive engagement. As well as building on the related terms and more recent work of Ungar (2007), Malone (2007), Gill (2007), Wyver, Bundy, et al. (2010) and Wyver, Tranter, et al. (2010), it was the deeper cognitive functions of the children that emerged. The study demonstrated a level of self-understanding by the children realised in their intellectual capacity to read safety and risk. The children acting with consciousness and logic is recognised in the term safety risk intelligence, which is used to label the new way of thinking about safety.

The term: safety risk intelligence. The contexts of the terms "safety", "risk" and "intelligence" were discussed comprehensively in Chapter 8. In summary, "safety" means the risk of injury is minimal or eliminated (NPHP, 2004), "risk" is associated with a level of exposure to danger, and "intelligence" is the ability to read life's experiences and situations and act with understanding (refer Chapter 8).

In this context, the reading of intelligence is not typical of the IQ and cognitive measures traditionally associated with intelligence, but is representative of a more holistic view of everyday skills built on self-awareness, knowledge and experiences. When the terms are brought together, safety risk intelligence in children means safety and risk concept formation as a form of consciousness and logic that is evident in children's actions in everyday life practices and activities.

In theorising about safety risk intelligence, there are guiding principles that help to better understand its context.

Guiding principles of safety risk intelligence. There are key ideas that have been revealed through important published literature and the pilot and main studies' findings on safety capacity building that have guided the thinking behind the concept of safety risk intelligence, and they have come to include the following:

- Healthy risk-taking is necessary for cultivating a safety intellect.
- Experiences important for building safety and risk competencies include challenges.
- Mechanisms of cognitive, physical and emotional satisfaction are included in the safety context.
- In the co-construction of knowledge process, the child has agency in the conceptualisation of safety and risk.
- Safety is conceptualised as a special relationship between the child and the environment.

Healthy risk-taking

Safety risk intelligence is grounded on a risk-benefit analysis approach where a healthy level of personal risk in everyday life is needed for a child's optimal growth (Brussoni & Olsen, 2012a; Gill, 2007; Malone, 2007; Ungar, 2007). By taking informed risks, certain benefits are gained based on the belief that it is the child's prior experiences that will determine how the child makes sense and meaning of a situation. This is an essential component for identity formation and self-regulation (Bodrova & Leong, 2007). In this context, behaviour is governed by the child's ability to act in a deliberate and intended manner, where thinking before doing is apparent, a characteristic of intelligence.

The concept of making a conscious, informed decision before acting is significant to the notion of safety and synonymous with safety risk intelligence. What is important is the relationship between the child's intentions ,where the child thinks about the level of risk associated with the circumstances, and the subsequent actions informed by prior experiences, knowledge and self-awareness of capabilities. To act with conscious understanding of their own personal capabilities is the foresight of a self-regulated child who thinks first and then acts with understanding later.

Healthy child development should include opportunities to take some risk, otherwise the child develops within an atmosphere of fear and inability to try new things and make decisions.

Importance of experiences that include challenges

Previous chapters have highlighted the importance of experiences that provide achievable challenges and play opportunities that enrich knowledge gain and competencies so that a child can read their environment and interpret safety and risk. The experiences the child engages in should aim to develop the child's capabilities by becoming more complex so the child is equipped to deal with new situations and the relationship with their environment in a more advanced way. As the experiences change, the child builds new skills and competencies to undertake activities with higher levels of risk. It is the relationship between the child's social and material worlds, and their capabilities to read risk situations that matter in their ability to become good safety risk assessors. Developing new competencies supported by adults includes expectations that the child will become independent in being able to collectively read risky situations over time. This was shown in the study finding where the children managed challenges safely, the parents gained trust in the child's capabilities and the child's level of independence was increased.

The more complex the experiences become, the more the child is challenged to manage the new situation and advance their learning. In this context, the adult slowly draws back from their involvement as the child assumes a stronger role. The guidance the adult provides to the child is not overemphasised, and the child's capabilities are valued, where their competence to take responsibility for themselves is recognised.

Literature has shown how many childhood injuries happen at times when children are independent and responsible for assessing their own safety and risk situations (Morrongiello & Matheis, 2007). Therefore it is the experiences that encourage independence, where sometimes children may make mistakes, that provide valuable lessons that are important in children's safety orientation. Ungar (2007) suggests that getting a minor injury may even help children to manage risk independently.

Relevance of cognitive, physical and emotional satisfaction in the safety context

As already mentioned, the work of Bodrova and Leong (2007) on self-regulation has foregrounded much of the thinking on the child's ability to act in a deliberate manner within the conceptualisation of safety risk intelligence. The studies demonstrated how a child's intentions and subsequent actions

require control of the physical and cognitive abilities together with their emotions in navigating safe behaviours.

In the examples referenced in Chapter 6, it was evident that the children were able to draw from prior experiences to assess the risk situations. For instance, when the children were taken on a guided walk, they applied practices gained from safety messages conveyed in the SeeMore Safety books to a real-life situation. The children were shown how to walk along the footpath and were made aware of cars exiting driveways. They were also taken to a variety of road crossings: one supervised by a "lollipop" lady, another with flags and a third with pedestrian lights. The children used their new knowledge, emotional understanding and physical capabilities to master their own behaviours in this everyday activity. In this context, the child's relationship with the environment is considered one of the most important factors in their experience. Each child would have experienced the road-crossing situation differently based on what they brought to the situation.

Emotional factors, influenced by prior knowledge and understanding, are one of the main reasons that situations are perceived and attended to in the way they are (Vygostsky, 1934), and influence safety behaviour.

To sense danger is an emotional understanding where one's own feelings are recognised. For instance, the child who crossed the monkey bars reaching the other side shown in Figure 8.1 in Chapter 8 has a perception of his ability to cross the bars safely. The child in Figure 10.4 wants to attempt the same activity as the older child but asks for assistance. Vygotsky's (1934) views on emotional experiences in the environment, determining what influences the child's development, helps to understand what the child is experiencing in this situation. He tells us it is the emotional experience that is responsible for a child becoming aware of, interpreting and emotionally relating to, a certain event (Vygotsky, 1934). Therefore, in this case, the child asking for assistance is influenced by her previous experience of the monkey bars. Each time the child engages in this same activity, she will experience it differently based on what she has brought to the situation from the last time (Vygotsky, 1934). As the child's abilities grow, the social context changes to accommodate the new skills the child has gained (Bodrova & Leong, 2007). In this example, the child draws on her cognitive, physical and emotional understanding to conceptualise the situation of completing the task, albeit in an entirely different manner to the older child.

Figure 10.4. A child being assisted in her activity by a more capable person.

In this activity, the younger child is being supported by the adult to develop her capabilities related to the activity through a shared-learning process. The social context matters in this situation because the child is collaboratively constructing the development of new skills with the help of the adult. This practice enables the child to develop her capabilities that will potentially allow her to perform the task independently over time.

In the co-construction of knowledge process the child has agency in conceptualisation of safety and risk

It is the style of child–adult interaction where a collaborative process provides a supportive structure in advancing the child's ability to develop understandings of safety and risk that matters. The study found that the SeeMore Safety program encourages a collaborative form of shared learning between the children and teachers, which was then extended to include other children, parents and siblings (refer chapters 4 and 5). Comments provided by parents indicated that positive shared-learning outcomes were achieved, where the psychological significance of the child's safety conceptualisation positioned the child to have agency in the situation and be powerful in the learning of others (see chapters 4 and 5).

Examples in Chapter 4 express the range of child–adult mediation positioning that was evident from the study findings. For instance, the example where the adult was initially "above" the child as the more knowledgeable person in the situation where the child's seatbelt was fastened by the adult.

Then the child took an "equal" position, voluntarily climbing into the booster seat and assisting to put on his own seatbelt. This was followed by the child becoming the more knowledgeable person by influencing the adult not to talk on the mobile phone whilst driving (PreSM 2).

Through this supportive process, the child reaches new levels of understanding which re-positions the child as having agency and influence in supporting behaviour change that goes beyond the preschool setting into the everyday life of the child. In this context, the social position of the child has changed as the concept of self is shaped by the social interactions where the positions each individual occupies reflect their ability to create new levels of consciousness in relation to safety and risk. The child's ability to recognise safe and unsafe situations and act accordingly demonstrates their growing competencies and capabilities of self-regulation.

Safety is conceptualised as a special relation between the child and the environment

Central to safety risk intelligence is the belief that children conceptualise safety by actively engaging in experiences and assessments of risk in their environment through a social process. This aligns with a cultural-historical view of child development where the child's relationship with their social and material environments are responsible for helping them to understand and make meaning of situations (Vygotsky, 1994). In this context, it is argued safety cannot be understood through singled-out targeted risk factors or statistics of injury; rather, it should be thought of holistically, conceptualised as a special relationship between the child and the child's environment (Vygotsky, 1934). Safety should not be viewed as a process of merely reducing the possibility of injury through eliminating the risk or changing the environment. Chapter 9 shows that such measures that were intended to protect children can be counterproductive.

In the development of safety risk intelligence, scaffolding for growth is mediated by more competent others, such as teachers and parents, where the child's current competencies to assess risk is understood in relation to the situation or environment they are about to experience. In this conceptualisation model, the support provided is in advance of the child's competence so they can collectively read risk situations or engage in experiences with greater levels of risk independently over time. It is the interrelationship between the child's social and material environments and the child's capabilities and the risk situations that will influence the child's ability to become a good safety risk assessor. Therefore it is the child's risk assessment relationship with their social and material environments that matters in safety and injury risk understanding. The *safety risk assessment model* introduced in chapters 7 and 9 illustrates the relationship between the child and

their social and material environments in safety conceptualisation as an active two-way process. The collective responsibility in shaping the child's safety and risk understanding plays a key role in developing capabilities for children to independently act safely through accurately reading risk situations.

The Bangladeshi study reported in Chapter 5 demonstrated the significant benefits that an intervention program can have on reducing childhood injury deaths (Linnan et al., 2012). It also highlighted how programs can be adapted to accommodate for cultural differences in providing children with injury prevention programs, and how the environment matters. Building swimming structures in village ponds as training sites enabled these children to gain swimming and water safety skills that children in other communities would experience in swimming pools.

Drowning accounts for 19% of all childhood injury deaths in Australia with swimming pools the most common location for such tragedies, followed by lakes, rivers, streams and the sea (Australian Bureau of Statistics, 2006). The diverse nature of aquatic environments means the risks associated with them are also very different. Therefore, methods used to keep children safe around water not only need to account for the differences, but also it must be kept in mind that one method alone may not be sufficient in providing children with what they need to manage their safety near water. Fencing water facilities and limiting access to them, using personal floatation devices and teaching a child to swim are proven effective water safety measures. However, it is the environment and the child's situation in it that will make the approach either effective or counterproductive. Where these measures come unstuck is when they are singled out because they give both the child and/or the parents a false sense of security. Fencing waterways is not practical in all situations, particularly for natural aquatic environments such as lakes and dams. Putting personal floatation devices on children without familiarising them with water prior to using the aids does not teach them the skills to be water safe.

In developing the skills children need to conceptualise safety, it is necessary to provide experiences that cater for the complexities associated with the risk factors, the environment and the child's relationship to it. It is for this reason that safety is understood as a special relationship between the child and their environment. A child who understands their capabilities in whatever risk situations they are exposed to and acts accordingly in a safe manner, is a self-aware and regulated child. It is the holistic context of risk factors in consideration of the child's relationship with the environment that forms the thinking behind safety risk intelligence. A child with good safety risk intelligence

would be able to read the risk factors more broadly rather than view them as a single entity. Furthermore, a sign of a safety risk intelligent child is when that child recognises a situation that poses a high level of personal injury risk and does not engage in it. Drawing from a cultural-historical view of childhood development as well as the findings of this study of an intervention program called SeeMore Safety, it has been shown that the concept of safety risk intelligence is useful for supporting early childhood education.

References

Alexander, S. (2001). *Kitchen Garden Foundation*. Retrieved from http://www.kitchengardenfoundation.org.au

Agbenyega, J. (2009). The Australian early development index, who does it measure: Piaget or Vygotsky's child? *Australasian Journal of Early Childhood, 34*(2), 31–38.

Andersen, P. (2010). Converting the bubble wrap generation into eco warriors: Results on the effectiveness of a co-signed protocol. *Leading change, living for one planet: 16th biennial conference Australian National University Canberra 26–30 September 2010 –conference journal* (pp. 1–7). Canberra, ACT: AAEE National Conference Committee.

Anning, A., Cullen, J., & Fleer, M. (Eds.). (2004). *Early childhood education, society and culture*. London, England: Sage Publications Ltd.

Ashby, K., & Corbo, M. (2000). Child fall injuries: An overview. *Hazard, 44*: 1–17. Victorian Injury Surveillance and Applied Research System (VISS). Melbourne, Vic: Monash University Accident Research Centre.

Australian Bureau of Statistics. (2006). *Year Book Australia, 2006* (No. 1301.0). Canberra, ACT: Author.

Australian Institute of Health and Welfare. (2005). *A picture of Australia's children* (No. PHE 58). Retrieved from http://www.aihw.gov.au/publication-detail/?id=6442467717

Australian Safe Communities Foundation. (2015). Retrieved from http://www.safecommunities.net au.

Ball, I. L., Farnhill, D., & Wangeman, J. F. (1984). Sex and age differences in sensation-seeking: Some national comparisons. *British Journal of Psychology, 75*(2), 257–265.

Bandura, A. (1997). *Social learning theory*. New York, NY: General Learning Press.

Berk, L. (2006*). Child development* (7th ed.). Boston, MA: Pearson Education.

Berk, L., & Winsler, A. (1995). *Scaffolding children's learning: Vygotsky and early childhood education*. Washington, DC: National Association for the Education of Young Children.

Bialostok, S., & Kamberelis, G. (2010). New capitalism, risk, and subjectification in an early childhood classroom. *Contemporary Issues in Early Childhood, 11*(3), 299–312.

Blunden, A. (2008). The problem of age. (Transcribed). *The Collected Works of L. S. Vygotsky, Volume 5, 1998*. (pp. 187–205). Retrieved from www.marxists.org/archive/vygotsky/works/1934/problem-age.htm

Bodrova, E., & Leong, D. (2003). The importance of being playful. *Educational Leadership, 60*(7), 50–53.

Bodrova, E., & Leong, D. (2007). *Tools of the mind: The Vygotskian approach to early childhood education*. Upper Saddle River, NJ: Pearson Education.

Bozhovich, L. I. (2004). L. S. Vygotsky's historical and cultural theory and its significance for contemporary studies of the psychology of personality. *Journal of Russian and East European Psychology, 42*(4), 20–34.

Bozhovich, L. I. (2009). The social situation of child development. *Journal of Russian and East European Psychology, 47*(4), 59–86.

Breivik, G. (1999). The quest for excitement and the safe society. *Safety Science Monitor: Special Edition, Philosophy of Safety, 2*(3), 52.

Brussoni, M., & Olsen, L. (2012a). The perils of overprotective parenting: Fathers' perspectives explored. *Child: Care, Health and Development, 39*(2), 237–245. doi:10.1111/j.1365-2214.2011.01361.x

Brussoni, M., & Olsen, L. (2012b). *The perils of overprotective parenting: Fathers' perspectives explored*. Child Health Dev. Affiliation: Department of Pediatrics, University of British Columbia School of Population and Public Health, University of British Columbia British Columbia Injury Research & Prevention Unit, and Child & Family Research Institute, ePup. Vancouver, Canada: John Wiley and Sons. Retrieved from. www.safetylit.org/week/journalpage.phd?jid=3306

Brussoni, M., Olsen, L., Pike, I., & Sleet, D. (2012). Risky play and children's safety: Balancing priorities for optimal child development. *International Journal of Environmental Research and Public Health, 9*(9), 3134–3148. doi:10.3390/ijerph9093134

Buchanan, C. (1999). Building better playgrounds: A project for parents? *UAB Magazine, 19*(3). Retrieved from http://main.uab.edu/show. asp?durki=25353

Cassell, E., & Clapperton, A. (2007). Preventing unintentional injury in Victorian children aged 0–14 years: A call to action. *Hazard, 65,* 1–14. Victorian Injury Surveillance Unit (VISU). Melbourne, Vic: Monash University Accident Research Centre.

Chaiklin, S., & Lave, J. (Eds.). (1996). *Understanding practice: Perspective on activity and content*. Cambridge, England: Cambridge University Press.

Chaiklin, S. (2003). The zone of proximal development in Vygotsky's analysis of learning and instruction. In A. Kozulin, B. Gindis, V. S Ageyev & S. M Miller (Eds.), *Vygotsky's educational theory and practice in cultural context* (pp 39–64). Cambridge, England: Cambridge University Press.

Christensen, P., & Mikkelsen, M. (2008). Jumping off and being careful: Children's strategies of risk management in everyday life. *Sociology of Health and Illness, 30*(1), 112–130.

Chudacoff, H. (1989). *How old are you?: Age consciousness in American culture*. Princeton, NJ: Princeton University Press.

Clapperton, A., & Cassell. E. (2009). The impact of area socioeconomic inequity on serious injury in Victoria. *Hazard, 70,* 1–32. Victorian Injury Surveillance Unit (VISU). Melbourne, Vic: Monash University Accident Research Centre

Clapperton, A., Cassell, E., & Wallace, A. (2003). Injury to children aged 5–15 years at school. *Hazard, 53,* 1–16. Victorian Injury Surveillance & Applied Research System (VISS) Melbourne, Vic: Monash University Accident Research Centre.

Cody, B., Mickalide, A., Paul, H., & Colella, J. (2002). *Child passengers at risk in America: A national study of restraint use*. Washington, DC: National SAFE KIDS Campaign.

Cody, B., Quraishi, A., Dastur, M., & Mickalide, A. (2004). *Clear danger: A national study of childhood drowning and related attitudes and behaviors*. Washington, DC: National SAFE KIDS Campaign.

Cole, M., & Wertsch, J. (1996). Beyond the individual-social antimony in discussions of Piaget and Vygotsky. *Human Development 1996, 39*. 250–256.

Crewe, N., & Zola, I. (Eds.). (1983). *Independent living for physically disabled people*. San Francisco, CA: Jossey Bass.

Dalton, T. (2005). Arnold Gesell and the maturation controversy. *Integrative Psychological and Behavioral Science, 40*(4), 182–204.

Damon, W. (1998). Preface. In W. Damon (Series Ed.) & R. M. Lerner (Vol. Ed.). *Handbook of child psychology, Vol. 1: Theoretical models of human development* (5th ed.) (pp. xi–xvii). New York, NY: John Wiley & Sons.

Daniels, H., Cole, M., & Wertsch, J. (2007). *The Cambridge Companion to Vygotsky*. Cambridge, UK: Cambridge University Press.

Davydov, V. V. (2008). *Problems of developmental instruction: A theoretical and experimental psychological study (international perspectives in non-classical psychology)*. New York, NY: Nova Science Publishers.

Department of Education and Early Childhood Development (DEECD). (2012). *Safety in physical education and sport*. Retrieved from (www.education.vic.gov.au/management/governance/spag/curriculum/safety/safesport.htm#H2N1005C

Department of Education, Employment and Workplace Relations (DEEWR). (2009). *Belonging, Being and Becoming – The Early Years Learning Framework for Australia*. Canberra, ACT: Australian Government Department of Education, Employment and Workplace Relations for the Council of Australian Governments.

Eager, D., & Little, H. (2011). Risk Deficit Disorder. *Proceedings of the IPWEA International Public Works Conference*. Canberra, ACT, Australia, 21–24 August 2011.

Eaton, W. (1989). Are sex differences in child motor activity level a function of sex differences in maturational status? *Child Development, 60*. 1005–1011.

Edgar, D., & Edgar, P. (2008). *The new child: In search of smarter grown-ups*. Melbourne, Vic: Wilkinson Publishing Pty Ltd.

Edwards, S. Fleer, M., & Nuttall, J. (2008). *A research paper to inform the development of the Early Years Learning Framework for Australia*. Victoria: Office of Children and Early Childhood Development, Department of Education Early Childhood Development, from www.deewr.gov.au/EarlyChildhood/Policy_ Agenda/Pages/home.aspx

Egan, K., & Gajdamaschko, N. (2003). Some cognitive tools of literacy. In A. Kozulin, B. Gindis, S. Ageyev & S. Miller (Eds.), *Vygotsky's educational theory in cultural context*. (pp. 83–98) Cambridge, UK. Cambridge University Press.

Elkonin, D. (1972). Toward the problem of stage in mental development of the child. *Soviet Psychology, 10*(3), 225-251. (Original work published 1971).

Fleer, M. (2005). Developmental fossils – unearthing the artefacts of early childhood education: The reification of 'child development'. *Australasian Journal of Early Childhood*, *30*(2), 2–7.

Fleer, M. (2009). Understanding the dialectical relations between everyday concepts and scientific concepts within play-based programs. *Research in Science Education, 39*(2), 281–306.

Fleer, M. (2010). *Early learning and development: Cultural historical concepts in play*. New York, NY: Cambridge University Press.

Fleer, M. (2011a). Conceptual play: Foregrounding imagination and cognition during concept formation in early years education. *Contemporary Issues in Early Childhood, 12*(3), 224–237.

Fleer, M. (2011b). Technologically constructed childhoods: Moving beyond a reproductive to a productive and critical view of curriculum development. *Australasian Journal of Early Childhood, 36*(1), 16–24.

Fleer, M., & Hedegaard, M. (2010). Children's development as participation in everyday practices across different institutions. *Mind, Culture, and Activity, 17*(2), 149–168.

Fleer, M., Hedegaard, M., & Tudge, J. (2009). (Eds.). *Constructing childhood: Global-local policies and practices*. *World Year Book Series*. New York, NY: Routledge.

Fleer, M., & Raban, B. (2007). *Early childhood literacy and numeracy: Building good practice*. Department of Education, Science & Training. Retrieved from http://www.dest.gov.au/NR/rdonlyres/072400D9-3172-460A-910BC190C3C21FDA /18862/ecl_buildinggoodpractice.pdf

Fleer, M., & Williams-Kennedy, D. (2002). *Building bridges: Research literacy development for young indigenous children*. Canberra, ACT: Australian Early Childhood Association.

Gay, L., Mills, G., & Airasian, P. (2009). *Education research competencies for analysis and applications*. Upper Saddle River, NJ: Pearson Education.

Gesell, A. (1933). Maturation and patterning of behavior. In C. Murchison (Ed.), *A Handbook of Child Psychology* (pp. 209–235). Worcester, MA: Clark University Press.

Gesell, A. (1946). The ontogenesis of infant behavior. In L Carmichael (Ed.), *Manual of Child Psychology* (pp. 295–331). Hoboken, NJ: John Wiley & Sons Inc.

Gill, T. (2007). *No Fear: Growing up in a risk averse society*. London, England: Calouste Gulbenkian Foundation.

Ginsburg, H., & Opper, S. (1988). *Piaget's theory of intellectual development* (3rd ed.). Upper Saddle River, NJ: Prentice Hall.

Greig, A., Taylor, J., & MacKay, T. (2007). *Doing research with children* (2nd ed.). London, England: Sage Publications Ltd.

Grieshaber, S. (2010). Departure from tradition: The early years learning framework for Australia. *International Journal of Child Care and Education Policy, 4*(2), 33–44.

Harrison, J. (1995). Australian Injury Data. In J. Ozanne-Smith & F. Williams (Eds.), *Injury Research and Prevention: A Text* (pp. 44–60). Melbourne, Vic: Monash University Accident Research Centre.

Heck, A., Collins, J., & Peterson, L. (2001). Decreasing children's risk taking on the playground. *Journal of Applied Behavior Analysis, 34*(3), 349–352.

Heckman, J. J., & Masterov, D. V. (2007). *The productivity argument for investing in young children: Discussion paper 2725*. Bonn, Germany: Institute for the Study of Labor.

Hedegaard, M. (1990). The zone of proximal development as basis for instruction. In L. C. Moll (Ed.), *Vygotsky and education: Instructional implications and applications of sociohistorical psychology* (pp. 349–371). Cambridge, England: Cambridge University Press.

Hedegaard, M. (2005). Strategies for dealing with conflicts in value positions between home and school: Influence on ethnic minority student's development of motives and identity. *Culture & Psychology, 11*(2), 187–205.

Hedegaard, M. (2009). Children's development from a cultural-historical approach: Children's activity in everyday local settings as foundation for their development. *Mind, Culture, and Activity, 16*(1), 64–81.

Hedegaard, M., & Fleer, M. (2008). *Studying children: A cultural-historical approach*. London, England: Open University Press.

Helps, Y., & Harrison, J. (2004). *Reported injury mortality of Aboriginal and Torres Strait Islander people in Australia, 1997–2000*. Canberra, ACT: Australian Institute of Health and Welfare.

Herrington, S., & Studtmann, K. (1998). Landscape interventions: New directions for the design of children's outdoor play environments. *Landscape and Urban Planning, 42*(2–4), 191–205.

Hutchby, I., & Moran-Ellis, J. (1998). *Children and social competence: Arenas of action*. London, England: Falmer Press.

Johnson, W. (2007). *Safety Education: Do kids know more than parents? Study paper*. Shaker Heights, OH: Shaker Heights Fire Department.

Jordan, B. (2004). Scaffolding learning and co-constructing understandings. In A. Anning, J. Cullen & M. Fleer (Eds.), *Early childhood education: Society and culture* (pp. 31–42). London, England: Sage Publications Ltd.

Karpov, Y. (2003). Vygotsky's doctrine of scientific concepts: Its role for contemporary education. In A. Kozulin, B. Gindis, S. Ageyev & S. Miller (Eds.), *Vygotsky's educational theory in cultural context* (pp. 65–82). Cambridge, England: Cambridge University Press.

Karpov, Y. (2005). *The neo-Vygotskian approach to child development*. New York, NY: Cambridge University Press.

Kincheloe, J. (2008). Educational psychology: Limitations and possibilities. In J. Kincheloe & R. Horn (Eds.), *Handbook of education and psychology* (pp. 3–40). West Port, CT: Praeger.

Kozulin, A. (1990). *Vygotsky's psychology: A biography of ideas*. Cambridge, MA: Harvard University Press.

Kozulin, A., Gindis, B., Ageyev, V., & Miller, S. (Eds.). (2003). *Vygotsky's Educational Theory in Cultural Context*. Cambridge, England: Cambridge University Press.

Kravtsov, G. G., & Kravtsova, E. E. (2009). Cultural-historical psychology in the practice of education. In M. Fleer, M. Hedegaard & J. Tudge (Eds.), *Childhood studies and the impact of globalization: Policies and practices at global and local levels. World Yearbook of Education* (pp. 202–212). New York, NY: Routledge.

Kravtsova, E. E. (2008, December). *Zone of potential development and subject positioning*. Paper presented at Vygotsky symposium, Monash University, Melbourne.

Krueger, R. (2000). *Focus groups: A practical guide for applied research* (3rd ed.). Thousand Oaks, CA: Sage Publications Inc.

Krueger, R. (2007a). *Interviewing*. Retrieved from http://www.tc.umn.edu/~rkrueger/evaluation_interviewing.html

Krueger, R. (2007b). *Tips for designing a survey questionnaire*. Retrieved from http://www.tc.umn.edu/~rkrueger/evaluation_tfdasq.html

Krueger, R., & Casey, M. (2000). *Focus groups: A practical guide for applied research* (3rd ed.). Thousand Oaks, CA: Sage Publications.

Lave, J. (1991). Situating learning in communities of practice. In L. Resnick, J. Levine & S. Teasley (Eds.), *Perspectives on socially shared cognition* (pp. 63–82). Washington, DC: American Psychological Association.

Lave, J., & Wenger, E. (1991). *Situated learning: Legitimate peripheral participation*. Cambridge, England: Cambridge University Press.

Lave, J., & Wenger, E. (1999). Learning and pedagogy in communities of practice. In J. Leach & B. Moon (Eds.), *Learners and pedagogy* (pp. 21–33). London, England: Paul Chapman Publishing.

Lehoczky, S., Isaacs, J., Grayson, N., & Hargreaves J. (2002). *Hospital statistics: Aboriginal and Torres Strait Islander Australians 1999–2000: Occasional paper*. (ABS No. 4711.0). Canberra, ACT: Australian Bureau of Statistics.

Leontiev, A. (1964). *Problems of mental development*. Washington, DC: US Joint Publication Research Service.

Leontiev, A. (1978). *Activity, consciousness and personality* (M. Hall, Trans.). Englewood Cliffs, NJ: Prentice Hall.

Linnan, M., Rahman, A., Scarr, J., Reinten-Reynolds, T., Linnan, H., Rui-wei, J., …Rahman, F. (2012). Child drowning: Evidence for a newly recognized cause of child mortality in low and middle income countries in Asia. *Working Paper 2007–12, Special Series on Child Injury No. 2*. Florence, Italy: UNICEF Office of Research.

Little, H. (2006). Children's risk-taking behaviour: Implications for early childhood policy and practice. *International Journal of Early Years Education, 14*(2), 141–154. doi:

10.1080/09669760600661427

Little, H. (2010). Risk, challenge and safety in outdoor play: Pedagogical and regulatory tensions. *Asia-Pacific Journal of Research in Early Childhood Education, 4*(1), 3–24.

Little, H., & Wyver, S. (2008). Outdoor play: Does avoiding the risks reduce the benefts? *Australian Journal of Early Childhood, 33*(2), 33–40.

Loescher, L., Emerson, J., Taylor, A., Hendrickson-Christensen, D., & McKinney, M. (1995). Educating preschoolers about sun safety. *American Journal of Public Health, 85*(7), 939–943.

Mack, M., Hudson, S. & Thompson, D. (1997). A descriptive analysis of children's playground injuries in the United States 1990–94. *Injury Prevention, 3*(2), 100–103. Retrieved from www.ncbi.nlm.nih.govJournal List›InjPrev›v.6(2).

Mahn, H. (2003). Periods in child development: Vygotsky's perspective. In A. Kozulin, B. Gindis, S. Ageyev & S. Miller (Eds.), *Vygotsky's educational theory in cultural context* (pp. 119–137). New York, NY: Cambridge University Press.

Malone, K. (2007). The bubble-wrap generation: Children growing up in walled gardens. *Environmental Education Research*, *13*(4), 513–527.

Malone. K. (2009). Designs for a child-friendly city. *Curriculum and Leadership Journal: An electronic journal for leaders in education, 7*(2), 1. Retrieved from www.curriculum.edu.au/leader/designsforachild,26559.html?issueID=11718.

McLachlan, C., Fleer, M., & Edwards, S. (2010). *Early childhood curriculum: Planning, assessment and implementation*. Melbourne, Vic: Cambridge University Press.

Mitchell, R., Cavanagh, M., & Eager, D. (2006). Not all risk is bad, playgrounds as a learning environment for children. *International Journal of Injury Control and Safety Promotion*, *13*(2), 122–124.

Moore, R., & Wong, H. (1997). *Natural learning: The life history of an environmental schoolyard*. Berkeley, CA: MIG Communications.

Morrongiello, B., & Dawber, T. (2004). Identifying factors that relate to children's risk-taking decisions. *Canadian Journal of Behavioural Science, 36*(4), 255–266.

Morrongiello, B., & Lasenby, J. (2007). Psychological determinants of risk taking by children: An integrated model and implications for interventions. *Injury Prevention, 13*(1), 20–25. doi:10.1136/ip.2005.011296

Morrongiello, B., & Matheis, S. (2007). Understanding children's injury-risk behaviors: The independent contributions of cognitions and emotions. *Journal of Pediatric Psychology, 32*(8), 926–937. doi:10.1093/jpepsy/jsm027

Morrongiello, B., & Rennie, H. (1998). Why do boys engage in more risk taking than girls? The role of attributions, beliefs and risk appraisals. *Journal of Pediatric Psychology, 23*(1), 33–43. doi:10.1093/jpepsy/23.1.33

Moscaritolo, M. (2009, April 7). Childcare centres ban superhero toys and clothes. *The Advertiser*. Retrieved from http://www.adelaidenow.com.au/news/childcare-centres-ban-superheros/story-e6freo8c-1225698502212?nk=0e8f100d14a38249081d78b0c4515a04

Murn, C. (2008, November). Your child is a wuss. *IPA Review*. p. 37. Retrieved from https://ipa.org.au/library/publication/1224631145_document_60-5_murn.pdf

National Public Health Partnership. (2004). *The national injury prevention and safety promotion plan: 2004–2014*. Canberra, ACT: Author.

Nsamenang, A.B., & Lamb, M.E. (1998). Socialization of Nso children in the Bamenda grassfields of northwest Cameroon. In M. Woodhead, D. Faulkner & K. Littleton (Eds.), *Cultural worlds of early childhood* (pp. 250–260). London, England: Routledge.

O'Donnell, A., Dobozy, E., Bartlett, B., Bryer, F., Reeve, J., & Smith, J. K. (2012). *Educational psycholog:First Australian edition*. Milton, Qld: John Wiley & Sons Australia, Ltd.

O'Neill, S. (2006). *SeeMore Safety*. Ballarat, Vic: KIDS Foundation.

O'Neill, S. (2014). *A child's voice on safety: Empowering children to influence positive safety behaviour in themselves and others*. Manuscript submitted for publication.

O'Neill, S. (in press). Safety risk intelligence: Children's concept formation. *Australasian Journal of Early Childhood*.

O'Neill, S., Fleer, M., Agbenyega, J., Ozanne-Smith, J., & Urlichs, M. (2013). A cultural-historical construction of safety education programs for preschool children: Findings from SeeMore Safety, the pilot study. *Australasian Journal of Early Childhood, 38*(2), 74–84.

Organisation for Economic Co-operation and Development (OECD). (2006). *Starting strong II: Early childhood education and care*. Paris, France: Organisation for Economic Co-operation and Development.

Ozanne-Smith, J., & Williams, F. (1995). *Injury Research and Prevention: A Text*. Melbourne, Vic: Monash University Accident Research Centre.

Palmer, S. (2006). *Toxic childhood: How the modern world is damaging our children and what we can do about it*. London, England: Orion

Parker, S. (2002). *McGraw-Hill dictionary of scientific and technical terms* (6th ed.). New York, NY: McGraw-Hill.

Piaget, J. (1929). *The child's conception of the world*. London, England: Routledge and Kegan Paul Ltd.

Piaget, J. (1970). *Science of education and the psychology of the child*. New York, NY: Orion Press.

Piaget, J. (1971). *Genetic epistemology*. New York, NY: W. W. Norton & Company.

Pointer, S., Harrison, J., & Bradley, C. (2003). *National injury prevention plan priorities for 2004 and beyond: Discussion paper*. Canberra, ACT: Australian Institute of Health and Welfare.

Polgar, S., & Thomas, S. (2008). *Introduction to research in the health sciences* (5th ed.). Edinburgh, Scotland: Churchill Livingstone Elsevier.

Prince, J. (2011). Looking out for the kids. *Fundraising and Philanthropy Australasia, 33*.

Prosser, L., Chakaodza, R., Stevens, M., & O'Neill, S. (2007, November). *School safety clubs as an injury prevention strategy for primary schools*. Paper presented at the 4th Asian Regional Conference on Safe Communities, Bangkok, Thailand.

Pyle, R. (2002). Eden in a vacant lot: Special places, species and kids in the neighborhood of life. In P. H. Kahn & S. R. Kellert (Eds.), *Children and nature: Psychological, sociocultural and evolutionary investigations* (pp. 305–328). Cambridge, MA: MIT Press.

Quaraishi, A., Mickalaide, A., & Cody, B. (2005). *Follow the leader: A national study of safety role modeling among parents and children*. Washington, DC: National Safe KIDS Campaign.

Queensland Health. (2007). *Child Injury Prevention*. Retrieved from http://www.health.qld.gov.au/chipp/what_is/e_of_injury

Raban, B., Nolan, A., Waniganayake, M., Ure, C., Brown, R., & Deans, J. (2007). *Building capacity: Strategic professional development for early childhood practitioners*. Melbourne, Vic: Thomson Social Science Press.

Reading, R. (2008). Area socioeconomic status and childhood injury morbidity in New South Wales, Australia. *Child: Care, Health and Development, 34*(1), 136–137.

Renshaw, P. (1992). The reading apprenticeship of preschool children. In J. Cullen & J. Williamson (Eds.), *The early years: Policy research, and practice*. Perth, WA*:* Meerilinga Young Children's Foundation.

Robbé, F. (2004, March*). Designing for delight: Creative playground solutions, no matter what!* Paper presented at the Kidsafe National Playground Conference, Sydney, NSW.

Rogoff, B. (1994). Developing understanding of the idea of communities of learners. *Mind, Culture, and Activity, 1*(4), 209–229.

Rogoff, B. (1995). Observing sociocultural activity on three planes: Participatory appropriation, guided participation and apprenticeship. In J. V. Wertsch, P. del Rio & A. Alvarez (Eds.), *Sociocultural studies of mind* (pp. 139–164). Cambridge, England: Cambridge University Press. Reprinted (2008) in K. Hall & P. Murphy (Eds.), *Pedagogy and practice: Culture and identities*. London, England: Sage Publications Ltd.

Rogoff, B. (2003). *The cultural nature of human development*. New York, NY: Oxford University Press.

Rosen, B., & Peterson, L. (1990). Gender differences in children's outdoor play injuries: A review and integration. *Clinical Psychology Review, 10*(2), 187–205.

Ryan, J. (2005). *Learning to be safe: Developing children's perceptions of safety and risk.* Australian Research Council Grant Application. Melbourne, Vic.

Safe Kids USA. (2009). *Raising safe kids one stage at a time: A study of child development and unintentional injury*. Retrieved from. http://www.usa.safekids.org

Saltmarsh, S. (2010). Lessons in safety: Cultural politics and safety education in a multiracial, multiethnic early childhood education setting. *Contemporary Issues in Early Childhood*, *11*(3), 288–298. doi: 10.2304/ciec.2010.11.3.288

Sandseter, E (2009). Risky play and risk management in Norwegian preschools: A qualitative observational study. *Safety Science Monitor, 13*(1), 1–12.

Shearn, P. (2006). Teaching practice in safety education: Qualitative evidence. *Research Papers in Education, 21*(3), 335–359.

Siraj-Blatchford, I. (2004). Quality teaching in the early years. In A. Anning, J. Cullen, & M. Fleer (Eds.), *Early childhood education: Society and culture* (pp. 137–148). London, England: Sage.

Siraj-Blatchford, I. (2007). Creativity, communication and collaboration: The identification of pedagogic progression in sustained shared thinking. *Asia-Pacific Journal of Research in Early Childhood Education, 1*(2), 3–23.

Skene, K. (2008, August 26). What a flippin' joke – Aussie school bans cartwheels. *The Townsville Bulletin*. Retrieved from http://www.global-report.com/philuche/a337012-what-a-flippin-joke-aussie-school-bans-cartwheels

Smeyers, P. (2010). Child rearing in the 'risk' society*:* On the discourse of rights and the 'best interests of a child'. *Educational Theory, 60*(3), 271–284.

Speltz, M., Gonzales, N., Sulzbacher, S., & Quan, L. (1990). Assessment of injury risk in young children: A preliminary study of the injury behaviour checklist. *Journal of Pediatric Psychology, 15*(3), 373–383.

SPSS for Windows, Version 17, 2008. Chicago: SPSS Inc.

Standards Australia. (1981). *Playground equipment for parks, schools and domestic use: part 1: general requirements* (AS 1924.1:1981). Homebush, NSW: Author.

Standards Australia. (1981). *Playground equipment for parks, schools and domestic use: part 2: design and construction – safety aspects* (AS 1924.2:1981). Homebush, NSW: Author.

Stetsenko, A., & Arievitch, I. M. (2004a). The self in cultural-historical activity theory: Reclaiming the unity of social and individual dimensions of human development. *Theory & Psychology, 14*(4), 475–503.

Stetsenko, A., & Arievitch, I. M. (2004b). Vygotskian collaborative project of social transformation: History, politics, and practice in knowledge construction. *The International Journal of Critical Psychology, 12*(4), 58–80.

Sumsion, J., Cheeseman, S., Kennedy, A., Barnes, S., Harrison, L., & Stonehouse, A. (2009). Insider perspectives on developing belonging, being and becoming: The early years learning framework for Australia. *Australasian Journal of Early Childhood, 34*(4), 4–13.

SwimSafe. (2015). *Preventing child drowning in Asia through teaching survival swimming skills*. Retrieved from http://swimsafe.org/swimsafe-projects/bangladesh/

Thompson, D., Rivara, F., & Thompson, R. (1999). Helmets for preventing head and facial injuries in bicyclists. *Cochrane Database of Systematic Reviews, 1999*(4). doi: 10.1002/14651858.CD001855

Thomson, J., Tolmie, A., Foot, H., & McLauren, B. (1996). *Child development and the aims of road safety education: A review and analysis. Road Safety Research Report No. 1*. Retrieved from http://www.dft.gov.uk

Tovey, H. (2007). *Playing outdoors: Spaces and places, risk and challenge*. Maidenhead, England: Open University Press.

Ungar, M. (2007). *Too safe for their own good: How risk and responsibility help teens thrive*. Crows Nest, NSW: Allen & Unwin.

Valentine, G. (1997). "Oh yes I can." "Oh no you can't": Children and parents' understandings of kids' competence to negotiate public space safely. *Antipode, 29*(1), 65–89. doi: 10.1111/1467-8330.00035

van Oers, B. (2009). Developmental education: Improving participation in cultural practices. In M. Fleer, M. Hedegaard, & J. Tudge (Eds.), *Childhood studies and the impact of globalization: Policies and practices at global and local levels. World Yearbook of Education* (pp. 213–229). New York, NY: Routledge.

Venger, L. A. (Ed.). (1986). *Development of cognitive abilities in preschool education*. Moscow, USSR: Pedagogika.

Venger, L. A. (1988). The origin and development of cognitive abilities in preschool children. *International Journal of Behavioral Development, 11*(2), 147–153. doi: 10.1177/016502548801100201

VicRoads. (2011). *Traffic safety education: Directions and Action Plan 2008-2010 Victoria*. Retrieved from http://www.arrivealive.vic.gov.au

Victorian Curriculum and Assessment Authority. (2008). *Appendices: Analysis of curriculum/learning frameworks for the early years (birth to age 8)*. East Melbourne, Vic: Author.

Vygotsky, L. (1929). *Mind in society*. Cambridge, MA: Harvard University Press.

Vygotsky, L. (1934). The problem of the environment. In R. van der Veer & J. Valsiner (Eds.), *The Vygotsky reader* (pp. 338–354). Cambridge, MA: Blackwell.

Vygotsky, L. (1962). *Thought and language* (E. Hanfmann & G. Vakar, Eds. & Trans.). Cambridge, MA: MIT Press.

Vygotsky, L.S. (1966). Play and its role in the mental development of the child. *Voprosy psikhologii, 12*, 62–76.

Vygotsky, L. (1976). Play and its role in the mental development of the child. In J. S. Bruner, A. Jolly & K. Sylva (Eds.), *Play: Its role in development and evolution*. (pp. 537–554). New York, NY: Basic Books.

Vygotsky, L. (1978). *Mind in society: The development of higher psychological processes*. Cambridge, MA: Harvard University Press.

Vygotsky, L. (1987). Thinking and speech (N. Minick, Trans.). In R. W. Rieber & A. S. Carton (Eds.), *The collective works of L.S Vygotsky: Vol 1, Problems of general psychology* (pp. 39–285). New York, NY: Plenum Press.

Vygotsky, L. (1994). The problem with the environment. In R. van der Veer & J. Valsiner (Eds.), *The Vygotsky Reader* (pp. 338–354). Oxford, UK: Blackwell

Vygotsky, L. (1997). The history of the development of higher mental functions (M. Hall, Trans.). In R. W. Rieber (Ed.), *The collected works of L. S. Vygotsky: Vol. 4, The history of the development of higher mental functions* (pp. 1–251). New York, NY: Plenum Press. (Original work written 1931).

Vygotsky, L. (1998). The problem of age (M. Hall, Trans.). In R. W. Rieber (Ed.), *The collected works of L. S. Vygotsky: Vol. 5, Child psychology* (pp. 187–205). New York, NY: Plenum Press. (Original work written 1933-1934).

Wentworth Courier. (2011). Council to scrap community tree house. 26 January 2011. Wentworth. Retrieved from http://wentworth-courier.whereilive.com.au/news/story/north-bondi-tree-house-saved/

White, F., Hayes, B., & Livesey, D. (2005). *Developmental psychology: From infancy to adulthood*. Sydney, NSW: Pearson Education.

Whitebread, D., & Neilson, K. (1998). *Cognitive and metacognitive processes. Report No. 06*. Retrieved from www. dft.gov.uk.

Wise, S., & Sanson, A. (2000). *Child care in cultural context: Issues for new research*. Melbourne, Vic: Australian Institute of Family Studies.

Wood, D., Bruner, J. S., & Ross, G. (1976). The role of tutoring in problem solving. *Journal of Child Psychology and Psychiatry, 17*(2), 89–100.

World Health Organization (WHO) and UNICEF (2008). Peden, M., Oyegbite, K., Ozanne-Smith, J., Hyder, A., Branche, C., Rahman, F., … Bartolomeos, K. (Eds.). *World report on child injury prevention*. Geneva, Switzerland: WHO Press.

Wyver, S., Bundy, A., Naughton, G., Tranter, P., Sandseter, E. B., & Ragan, J. (2010). Safe outdoor play for young children: Paradoxes and consequences. In S. Howard (Ed.), *AARE International Education Research Conference*. Retrieved from http://www.aare.edu.au/10pap/abs10.htm

Wyver, S., Tranter, P., Naughton, G., Little, H., Sandseter, E. B., & Bundy, A. (2010). Ten ways to restrict children's freedom to play: The problem of surplus safety. *Contemporary Issues in Early Childhood, 11*(3), 263–277.

YMCA (2008). *The Victorian Premier's Active Families Challenge*. Retrieved from http://victoria.ymca.org.au/cpa/htm/htm_article.asp

Zaporozhets, A. (1997). Principal problems in the ontogeny of the mind. *Journal of Russian & East European Psychology, 35*(1), 53–94.

Zuckerman, M. (2000). Are you a risk taker? *Psychology Today, 33*(6), 52–57.

Zuckerman, M. (2003). Biological bases of personality. In T. Milton & M. J. Lerner (Eds.), *Handbook of psychology: Personality and social psychology, Vol 5,* (pp. 85–116). Hoboken, NJ: John Wiley & Sons, Inc.

Zuckerman, M. (2007). *Sensation seeking and risky behavior*. Washington, DC: American Psychology Association.

Appendices

Appendix A

5th May 2009

EXPLANATORY STATEMENT (AUSTRALIA)

Project Title: Developing effective safety education programs for children.

Project Number: CF08/3282 - 2008001603

Researcher: Susie (Sue-anne) O'Neill, PhD Student, Faculty of education, Monash University under the supervision of Professor Marilyn Fleer.

Research Question: Can safety education programs designed for children between four and six years of age provide a foundation for children to develop an understanding of how to manage decisions about their own safety?

Project Number:

Participants: Children, parents and teachers from pre-schools in the Ballarat Region

My name is Susie O'Neill, a PhD student in the Faculty of Education at Monash University. I am conducting a research project under the supervision of Professor Marilyn Fleer to investigate whether pre-school injury prevention programs can educate children to manage their own safety. My research will use a program named SeeMore Safety which has been developed as a resource to educate children aged between 4 and 6 on safety. The study will include surveys and tests, interviews and focus groups along with visual images.

Purpose of the research: The purpose of this study is to investigate whether a safety education program for children aged four to six years can increase safety awareness, knowledge and problem-solving skills to enhance children's ability to manage their own safety. The study will compare child safety education programs in pre-schools.

This age group has been chosen due to the fact that they have a large proportion of children hospitalised due to preventable injuries.

Aims and benefits: The aim of the research project is to investigate whether children of pre-school age can develop knowledge and problem-solving skills that allows them to make informed choices about their own safety behaviours. The outcome of the project is to develop a safety education model for children. If shown to be effective, it could be developed into a model for adoption more broadly to inform practice in the area of child safety and the development of risk management skills in ways that can be embedded within mainstream education and learning.

Desirable Outcomes:

- Injury reduction in children
- Increased safety awareness
- Safety knowledge gained
- Positive behavioural change

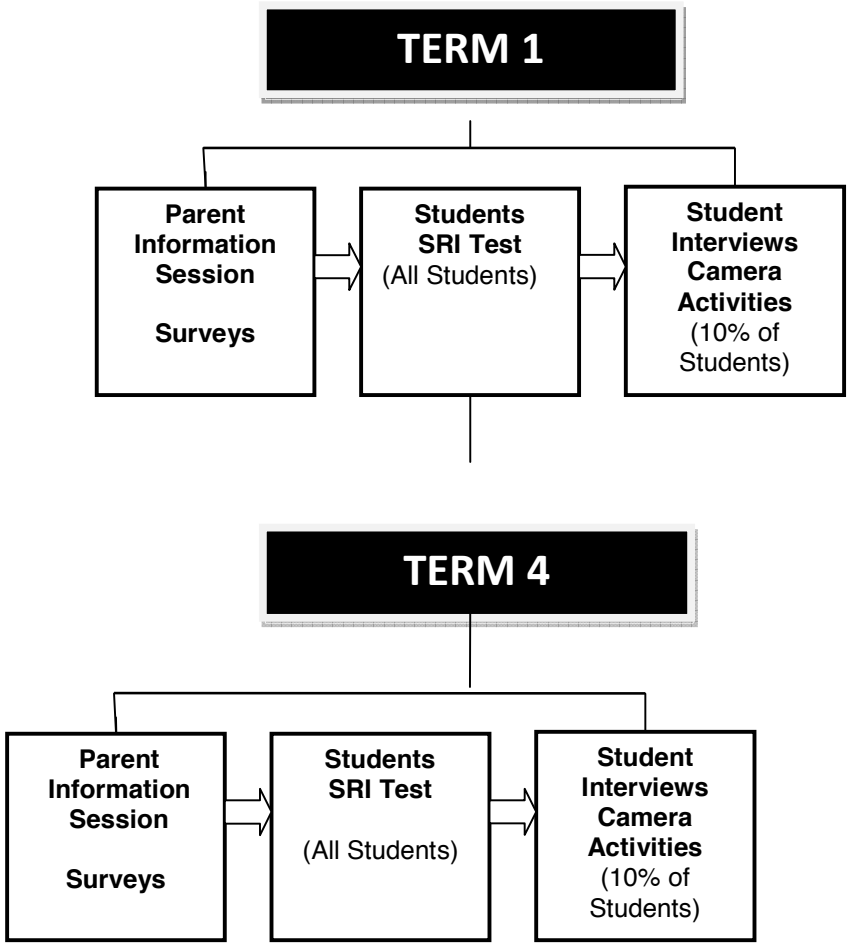
The research process: Participation in the research study is voluntary. A child or parent will not be disadvantaged in any way if he/she does not participate. Consent to participate will be sought for all children before they are eligible to participate in the study. Children whose

parents chose not to sign informed consent forms will participate in the safety education program as a general class activity, but will not be involved in the research component.

Parents will be invited to attend information sessions arranged by the pre-school teacher. Information sessions will take place in term 1 and term 4. At each information session, parents will receive a survey to be completed and returned to the researcher. Children for whom consent forms are signed will be invited to participate in the SRI Test. The SRI Test is an instrument designed to gauge the child's ability to recognise safe and unsafe situations. The SRI Test includes 20 picture cards depicting 10 unsafe and 10 safe behaviours. The students will be randomly selected and separated into groups with five students or less in each group. Only one group will engage in the test at any one time to enable the researcher to record response times accurately. This will also be captured using a DVD camera and discussions later transcribed for further analysis.

A random selection of 10% of participating students will be involved in interview sessions. Approximately 20 children will take part in the one-on-one interview sessions in term one and term 4. The second interview sessions will involve a different group of participants to provide a wider representation.

Children in both interview groups will be provided with cameras to take home and asked to take photographs of things they consider safe and unsafe in and around their homes, under adult supervision. The photos will be printed and used to prompt discussion about safe and unsafe situations, behaviours and consequences of actions. The discussions will be captured on DVD recorded and later transcribed to represent accurate contributions from the participants.



Time allocation for each participant:

Teachers: 2, 20 minutes interviews with the researcher.

Parents: 2, half hour information sessions with the researcher.

Children: It is expected that each group of children will spend 2 to 8 minutes to sort the cards. The focus group children will spend approximately 20 minutes taking the photographs and 20 minutes for discussing the images, these will not happen concurrently.

Inconvenience/discomfort: Teachers will support the researcher to ensure the health and safety of the participating children. It is not anticipated that there will be any adverse

consequences as a result of participation in this study. If a participant feels uncomfortable about any activity or procedure they can decline to continue participation.

Payment: There is no financial or any other form of remuneration.

Withdrawing from participation: Participation is voluntary and participants are free to withdraw at any time.

Confidentiality: The research has been designed to ensure confidentiality and anonymity.

Storage of data: Data collected will be stored by the researcher through the university for 5 years and reports will have no identifiers.

Use of data for other purposes: The data collected will be used for this research project and may be used for other related projects. Both still and moving images will be used in the presentation of the research, but will only involve participants that have signed a consent form.

Mandatory Reporting: The research student is compelled by law to report to appropriate authorities any concerns for the welfare of any children participating in the research.

Queries or complaints regarding the conduct of the research project: In case there are further questions or complaints about the nature and conduct of this research please contact:

Human Ethics

Monash Research Office

Building 3E, Room 111

Monash University, Clayton 3800

[redacted]

[redacted]

Project Number: CF08/3282 – 2008001603

If you would like feedback on this project, please contact Susie O'Neill on [redacted]

Kind regards

Susie O'Neill

Student: Faculty of Education

Monash University

PO Box 12

Wendouree, VIC 3355

[redacted]

Professor Marilyn Fleer

Faculty of Education

Monash University

PO Box 527

Frankston, VIC 3199

[redacted]

Appendix B

5th September 2009

Name

Director

Preschool/Kindergarten

Dear,

Re: Invitation to participate in a research project: Developing effective safety education programs for children (Project Number: CF08/3282 – 2008001603).

My name is Susie O'Neill, a PhD student in the Faculty of Education at Monash University. I am conducting a research project under the supervision of Professor Marilyn Fleer to investigate whether a safety education program for children aged four to six years can increase safety awareness, knowledge and problem-solving skills to enhance children's ability to manage their own safety. My research will involve the use of pre and post intervention surveys and tests, in-depth interviews and focus groups along with visual images to explore children's understanding of their own development in relation to safety. This age group has been chosen as it has a large proportion of children hospitalised due to injuries.

Pre-schools will be provided with training and safety education resources free of charge. All children will receive a copy of each story book (6 in total) to take home to share with their families free of charge. Each kindergarten will be provided with a class story book for each topic, posters for each topic

with a spot the hazard activity and a poem to learn. A teacher's resource manual will also be provided for follow up activities.

This project has been approved by Monash Ethics for research involving humans. I have attached the explanatory statement detailing how the pre-school and the children will be involved in the research process. I'm currently looking for expressions of interest from kindergartens to participate in the research and safety education program.

For further information or to register your details please email Susie on smone2@student.monash.edu.

Attached are the explanatory statement and consent forms.

Kind regards

Susie O'Neill, Student: Faculty of Education, Monash University

P.O. Box 12 Wendouree VIC 3355 [redacted]

[redacted]

Appendix C

3rd March 2009

Dear Parent or Guardian,

Re: Invitation to participate in a research project: Developing effective safety education programs for children.

My name is Susie O'Neill, a PhD student in the Faculty of Education at Monash University. I am conducting a research project to investigate whether a targeted evidence-based safety education program for children aged four to six years can increase safety awareness, knowledge and problem-solving skills to enhance children's ability to manage their own safety. My research will involve the use of visual images and video recording to explore children's understanding of their development in relation to safety and their ability to recognise safe and unsafe situations.

Your child will receive a copy of 6 story books to take home to share with your family free of charge. The books are part of the safety education program your pre-school will be involved in as part of the research.

This project has been approved by Monash Ethics for research involving humans. I have attached the explanatory statement detailing how you and your children will be involved in the research process. If you are willing and allow your child to participate, please sign and return the attached consent form to your child's preschool director.

Thank you for your assistance.

Kind regards

Susie O'Neill, Student: Faculty of Education, Monash University

P.O. Box 12 Wendouree VIC 3355 [redacted]

[redacted]

Appendix D

INFORMED CONSENT FORM

(For participating children)

Project Title: Developing effective safety education programs for children.

I agree for my child to take part in the above Monash University research project. The project has been explained to my child and I, and that I have read the Explanatory Statement, which I will keep for my records.

I understand that in agreeing to my child taking part in the research he or she will:

- Have her/his interactions captured on still photographs and a video camera using the SeeMore resources and participating in activities.

Use of images in any publications resulting from this project

Upon completion of this project, the researchers may want to publish images and video as examples of the findings. For example, the researchers may include photographs in a book or parts of videos in electronic publications or educational videos.

Please tick the appropriate box:

- ❑ The images and video of my child CAN be used in publications resulting from this project.
- ❑ Only the images of my child only CAN be used in publications resulting from this project.
- ❑ Only the video of my child CAN be used in publications resulting from this project.
- ❑ The images and video of my child CANNOT be used in publications resulting from this project.

Further use of data

Upon completion of this research, the researchers may want to use words and images collected from this project for educational purposes including publications in books, journals or CDRoms, presentations to peers or to students in lectures, or in professional conferences.

Please tick the appropriate box(es):

- ❑ The information provided by my child (including words and images) CAN be used for educational purposes.
- ❑ The information provided by my child (including words and images) CAN be used at professional conferences.
- ❑ The information provided by my child CANNOT be used for either educational purposes or at conferences.

The researchers might also like to use and / or share the data collected on this study for further research.

Please tick the appropriate box:

- ❑ The information provided by my child (including words and images) CAN be used in further research projects which have ethics approval.
- ❑ The information provided by my child (including words and images) CANNOT be used in further research projects without asking me first.
- ❑ The information provided by my child (including words and images) CANNOT be used in further research.

If you are agreeing on behalf of your child to take part in this study, please sign this form where indicated.

You might like to discuss the research project with the researcher further. If so, please feel free to contact Susie O'Neill via email smone2@student.monash.edu or provide your phone number and I will phone you on receiving your details.

Name:

Your phone number or preferred way to contact you:

_____ _____

Name of parent Name of child

_____ _____

Signature of parent Date

Please return this form to your pre-school Director in the attached envelope or you can post it to:

Susie O'Neill
PO. Box 12
Wendouree VIC 3355

[redacted]
[redacted]

Appendix E

Parent Questionnaire: Safety Knowledge, Skills and Behaviour (SKSB) Checklist

My name is Susie O'Neill, a PhD student in the Faculty of Education at Monash University. I am conducting a research project to investigate whether a targeted evidence-based safety education program for children aged four to six years can increase safety awareness, knowledge and problem-solving skills to enhance children's ability to manage their own safety. The aim is to create and implement a range of intervention activities designed to reduce the incidence of unintentional injuries amongst children aged between 4–6 years.

A program named SeeMore Safety has been developed to be used as a resource to educate children aged between 4 and 6 on safety. The SKSB Checklist has been devised to provide feedback on your child's safety knowledge, skills and behaviours and will be compared with data obtained at the completion of the study.

I appreciate your thoughts and value your comments. Your name and child's name will not be disclosed and the information given will be used solely for the purpose of evaluating the new SeeMore Safety program.

PLEASE RETURN TO: Pre-school Director

Your name……

Your child's name……

PLEASE ANSWER THE FOLLOWING 24 QUESTIONS IN RELATION TO YOUR CHILD'S SAFETY KNOWLEDGE, SKILLS AND BEHAVIOURS:

Rate the importance using the following scale:

(1 = Never 2 = Rarely 3 = Unsure 4 = Often 5 = Almost Always)

1. Runs or steps onto the road without looking ……1 2 3 4 5
2. Holds an adult's hand when crossing a road ……...1 2 3 4 5
3. Recognises the meaning of a red pedestrian light ……1 2 3 4 5
4. Misbehaves in the car and distracts the driver ……1 2 3 4 5
5. Resists wearing a seatbelt in the car ……..1 2 3 4 5
6. Puts on a helmet before riding a bicycle without prompting 1 2 3 4 5
7. Rides a bike in unsafe areas ……..1 2 3 4 5
8. Jumps from high structures such as furniture ……..1 2 3 4 5
9. Climbs onto high objects or structures ……1 2 3 4 5
10. Attempts to play on playground equipment too advanced1 2 3 4 5
11. Knows to apply sun screen, wears a hat and shirt in the sun.1 2 3 4 5
12. Asks permission to leave the house……...1 2 3 4 5
13. Becomes lost in crowds ……1 2 3 4 5
14. Wanders into areas that are off limits ……..…1 2 3 4 5
15. Is attracted to fire ……..1 2 3 4 5
16. Touches hot objects ……....1 2 3 4 5
17. Places fingers or objects into electrical appliances ……..…1 2 3 4 5
18. Plays with sharp objects ……..1 2 3 4 5
19. Comes in contact with dangerous substances ……..1 2 3 4 5
20. Behaves responsibly in and around water ……...1 2 3 4 5
21. Approaches unfamiliar animals such as dogs ……1 2 3 4 5
22. Hurts other children ……1 2 3 4 5
23. Keeps to the left when riding a bike in public places..…… 1 2 3 4 5

24. Knows why there are yellow and red flags at the beach…..1 2 3 4 5

Other comments you may like to make in regards to your child's safety knowledge skills and behaviours:

……

……

……

Thank you for completing this questionnaire, your time and effort has been very much appreciated.

Warmest regards

Susie O'Neill

Student: Faculty of Education

Monash University

P.O. Box 12

Wendouree

VIC 3355

[redacted]

SKSB RATING SCALE

Rate the importance using the following scale:

1 = Never 2 = Rarely 3 = Unsure 4 = Often 5 = Almost Always

5 = Never 4 = Rarely 3 = Unsure 2 = Often 1 = Almost Always .....

1. Runs or steps onto the road without looking 1 2 3 4 5
2. Holds an adult's hand when crossing a road 1 2 3 4 5
3. Recognises the meaning of a red pedestrian light 1 2 3 4 5
4. Misbehaves in the car and distracts the driver 1 2 3 4 5
5. Resists wearing a seatbelt in the car 1 2 3 4 5
6. Puts on a helmet before riding a bicycle without prompting 1 2 3 4 5
7. Rides a bike in unsafe areas 1 2 3 4 5
8. Jumps from high structures such as furniture 1 2 3 4 5
9. Climbs onto high objects or structures 1 2 3 4 5
10. Attempts to play on playground equipment too advanced.....1 2 3 4 5
11. Knows to apply sun screen, wears a hat and shirt in the sun.....1 2 3 4 5
12. Asks permission to leave the house.....1 2 3 4 5
13. Becomes lost in crowds 1 2 3 4 5
14. Wanders into areas that are off limits 1 2 3 4 5
15. Is attracted to fire 1 2 3 4 5
16. Touches hot objects 1 2 3 4 5
17. Places fingers or objects into electrical appliances 1 2 3 4 5
18. Plays with sharp objects 1 2 3 4 5
19. Comes in contact with dangerous substances 1 2 3 4 5
20. Behaves responsibly in and around water 1 2 3 4 5

21. Approaches unfamiliar animals such as dogs ……1 2 3 4 5

22. Hurts other children ……1 2 3 4 5

23. Keeps to the left when riding a bike in public places……1 2 3 4 5

24. Knows why there are yellow and red flags at the beach…….1 2 3 4 5

Appendix F

Safety Risk Intelligence (SRI) Test

The SRI Test is an instrument designed to gauge the child's ability to distinguish between safe and unsafe situations.

The SRI Test includes a recording chart, 20 picture cards depicting 10 unsafe and 10 safe behaviours and 2 title cards – safe and unsafe.

PROCEDURE:

- Each student is to be given the two title cards:
  - A card with a happy SeeMore face and the word safe underneath
  - A card with an unhappy SeeMore face and the word unsafe underneath.
- The 20 additional safe and unsafe behaviour cards are to be given to each student face down.
- Ask the students to turn the cards over and sort them into two piles, unsafe and safe.

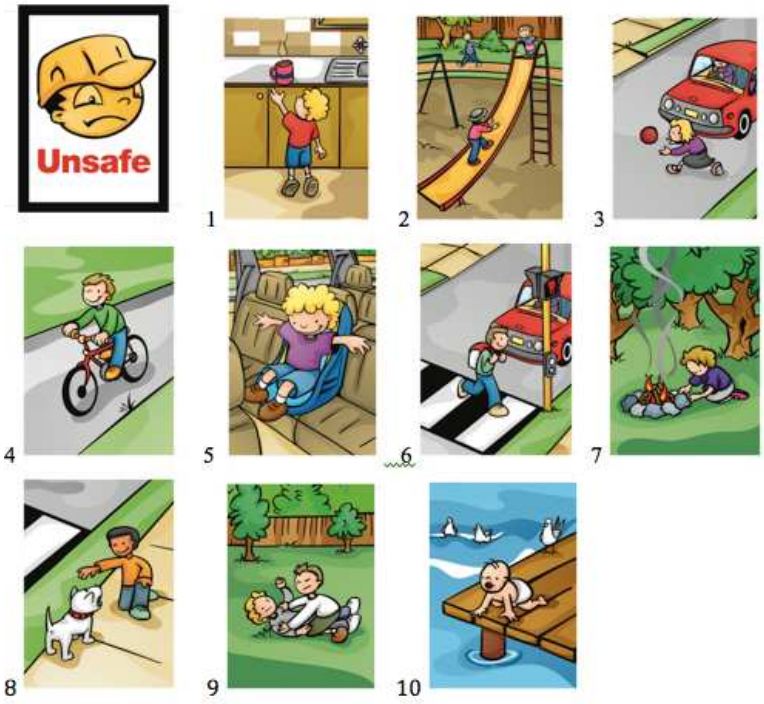
SCORING:

- Count up the cards that have been correctly placed as safe and unsafe. Each student is to be given a mark out of 20 for correct placement of cards.
- Once the student has completed sorting the cards they are also to be given a score according to their response time.
- The response time is based on a 5 point scale ranging from 1 point [for five minutes and over] to 5 points [for less than two minutes].

Minutes	Points
5+	1
4 – 4:59	2
3 – 3:59	3
2 – 2:59	4
0 – 1:59	5

nb: The response time is considered significant in reading and reacting to a safety risk situation.

1. Swim between the flags, swim with a grown up, protection from the sun.
2. Travel in a car seat or booster that is right for your age, always wear a seatbelt.
3. Always wear a helmet, wear sensible shoes, be seen, ride a bike suitable for your size.
4. Cross at the safest place, make sure the traffic has stopped before crossing. Cross with an adult or where there is adult supervision.
5. Stay with an adult in a crowd, hold hands so you don't get lost.
6. Always wear a life jacket when on a boat or taking part in water sports such as water skiing or jet skiing.
7. Medicines and any chemicals should be kept out of reach of children or locked away.
8. Always protect yourself from the sun, use sunscreen, wear a hat, rash vest and seek shade.
9. Cross at the safest place with adult supervision, wait for the green man but still check that the traffic has stopped before crossing.
10. Be kind to others, play nicely and take care of your friends.



1. Never reach for things on a bench, you never know wha they contain. Hot drinks should not be left in a child's reach.
2. Use playground equipment correctly and stick to the equipment which suits your size and skill. Don't let others talk you into doing something you are not comfortable with.
3. Never chase toys onto the road. Always ask an adult.
4. Never ride without a helmet.
5. Never travel in a car without a seatbelt on.
6. Always cross the road at the safest place, check that the lights are showing a green man and that the cars have stopped before crossing.
7. Children should never be left alone with a fire, never get too close and make sure an adult is with you when there is an open fire.
8. Never approach a dog who is not with its owner. Always check with the owner before patting a dog.
9. Play nicely and talk about how you feel instead of fighting and hurting others.
10. Children should never be left alone near water.

NAME OF CENTRE:

CHILD ID	POST TEST			COMMENTS
	Score out of 20	Response time	TOTAL	