Remember When You Believed Anything and Everything?
Understanding Social Vulnerability in Children

Rebecca Seward
BSc (Honours), BCom

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to fulfil the requirements for the degree of Doctor of Philosophy in the discipline of Psychology,
and in partial completion of the requirements for the Master of Psychology (Clinical) degree.

School of Psychology, University of Western Australia
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Thesis Declaration

I, Rebecca Seward, certify that:

This thesis has been substantially accomplished during enrolment in the degree.

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The research involving human data reported in this thesis was assessed and approved by The University of Western Australia Human Research Ethics Committee (approval number: RA/4/1/6369).

The following approvals were obtained prior to commencing the relevant work described in this thesis: Department of Education, Government of Western Australia; Catholic Education Office of Western Australia; Department for Education and Child Development, Government of South Australia; Department of Education and Communities, New South Wales Government; Department of Education, Training and Employment; Queensland Government.

This thesis contains published work and/or work prepared for publication, all of which has been co-authored.

Rebecca Seward [Candidate] 20 December 2016 Date
Abstract

Survival in the social world requires the ability to identify situations where involvement may lead to negative consequences. An impaired ability to detect or avoid potentially harmful interpersonal interactions is referred to as social vulnerability. Despite the potential for social vulnerability to inform us on children who might be at risk in social situations, there has been very little empirical research that has investigated social vulnerability in child developmental psychology. This thesis aimed to address this gap in the literature, firstly by developing a tool to measure social vulnerability in typically developing children, and then by investigating the underlying cognitive mechanisms and psychosocial consequences of social vulnerability.

The first study (Chapter 2) reports findings on the development of a parent-report instrument for measuring social vulnerability in children: the Children’s Social Vulnerability Questionnaire (CSVQ). Participants were parents \( n = 902 \) of Australian elementary school-aged children (3- to 12-years), and a sample teachers \( n = 96 \) who were used for a cross-informant report reliability assessment. Data presented indicated that the CSVQ is a reliable and valid measure for assessing social vulnerability in typically developing children. Consistent with theory, parents perceived greater levels of social vulnerability in younger than older children. Additionally, the study provided preliminary evidence to suggest that social vulnerability is associated with psychosocial maladjustment, and that children with clinical needs display heightened levels of social vulnerability compared to typically developing peers.

Using the scale developed in Chapter 2, the remaining studies of the thesis aimed to further our understanding of social vulnerability during childhood. In Chapter 3, the cognitive mechanisms associated with social vulnerability were examined. Specifically, the contributions of theory of mind, executive functioning and language ability were tested. Participants were children aged 6- to 9-years old \( n = 118 \) and their
parents. A path analysis identified that theory of mind fully mediated the relationship of executive functioning and language ability to social vulnerability, demonstrating that higher levels of executive functioning and language ability were associated with higher levels of theory of mind, which in turn were associated with lower levels of social vulnerability. These results suggest that theory of mind plays an important role in vulnerable social interactions.

Finally, across Chapter 4 and Chapter 5, the association of social vulnerability with peer interactions and psychological adjustment were examined. In Chapter 4, it was demonstrated that parent-reported social vulnerability was associated with increased peer victimisation (both overt and relational), but not bullying behaviour in elementary school-aged children ($n = 194$). Importantly, social vulnerability contributed unique variance to the prediction of peer victimisation after accounting for psychosocial adjustment. Chapter 5 aimed to further extend these findings by employing a longitudinal study design and exploring a broader array of psychosocial difficulties. It was demonstrated that social vulnerability was concurrently associated with internalising symptoms and peer victimisation, but that baseline levels of social vulnerability were not associated with risk for future psychosocial adjustment difficulties. The results across both studies strengthen support for social vulnerability as an important facet of children’s peer interactions and psychological adjustment.

Together, the findings indicate that social vulnerability can be reliability assessed in children using parent reports, and that social vulnerability is a valid construct for indicating psychosocial risk during childhood. Moreover, they provide some indication as to why some children are more socially vulnerable compared to their peers. The theoretical and clinical implications of the findings are discussed in the General Discussion.
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Authorship Declaration

Each of the studies contained within the thesis was designed by the candidate in collaboration with her supervisors, Doctor Donna Bayliss and Doctor Jeneva Ohan. All data collection and data analysis was performed by the candidate. The manuscripts were written by the candidate, with revisions made in accordance with suggestions from the supervisors and anonymous reviewers.

The following manuscripts arose from this thesis and are presented in the following chapters:

**Chapter 2**
Seward, R. J., Bayliss, D. M. & Ohan, J. O. (2016a). *The Children’s Social Vulnerability Questionnaire: Validation, relationship with psychosocial functioning, and age-related differences*. A shorterned version of this manuscript has been submitted for publication.

**Chapter 3**

**Chapter 4**

**Chapter 5**
I, Donna Bayliss, certify that the student statements regarding their contribution to each of the works listed above are correct.

Donna Bayliss [Coordinating Supervisor]

I, Jeneva Ohan, certify that the student statements regarding their contribution to each of the works listed above are correct.

Jeneva Ohan [Co-Supervisor]
Preface

The abilities to establish successful interpersonal interactions and to function effectively in social situations are amongst the most important tasks of child development. Poor social functioning during childhood has been linked to later adjustment problems. It is therefore important to thoroughly understand the skills required for successful (and contribute to unsuccessful) social interactions. A skill that is yet to be considered as an important facet of social interactions in child developmental psychology is social vulnerability (i.e., an impaired ability to detect or avoid potentially harmful interpersonal interactions). Currently, we have no clear understanding of how social vulnerability develops during childhood, why some children are more socially vulnerable than others, or of the impact of social vulnerability on a child’s social, emotional and behavioural outcomes. Consequently, this thesis addresses an important gap within developmental psychology by presenting a systematic program of research that investigates social vulnerability during childhood. Across the studies presented, it is demonstrated that social vulnerability is an important psychosocial construct that has the potential to inform us on how children relate to each other in ways that are not currently captured in measures of social skills or peer problems. The research contributes to our understanding of the developmental trajectory of social vulnerability in children, as well as the identification of cognitive mechanisms that are associated with social vulnerability. Importantly, the research indicates that our current theoretical and empirical understanding of individual-level risk factors for psychosocial maladjustment should be altered to include social vulnerability in order to help identify children who are at immediate risk of experiencing social, emotional and behavioural difficulties.

Accordingly, this thesis comprises a collection of studies that were conducted to explore social vulnerability in children. In accordance with the University of Western
Australia’s postgraduate and research scholarships regulation 41 (1), the thesis is presented as a series of papers, such that all empirical studies are presented in a format suitable for publication in peer reviewed journals. The six chapters of the thesis consist of an introductory account of the research, followed by four chapters which each describe an empirical study, and finally, a general discussion and conclusions chapter closes the thesis. The four empirical studies can be read as a part of the whole thesis, or as separate entities. Each of these chapters contains an independent introduction, methods, results and discussion section, and is concerned with a similar or related research question, therefore, some overlap is unavoidable. In addition, each chapter is independently referenced to acknowledge the contributions of previous related works.

The thesis contains six chapters as described below:

**Chapter 1** consists of a general introduction, providing background information on social vulnerability. The chapter explains theoretical conceptualisations of social vulnerability and reviews current empirical research relevant to the area.

**Chapter 2** describes the development of a questionnaire to measure parent-reports of social vulnerability in typically developing children. A shortened version of this chapter has been submitted for publication.

**Chapter 3** examines the cognitive mechanisms associated with social vulnerability in typically developing children. Specifically, the contributions of theory of mind, executive functioning and language were explored. This chapter has been prepared for publication.

**Chapter 4** explores the contribution of social vulnerability to the prediction of peer victimisation and bullying behaviour in typically developing children. This chapter has been submitted for publication.

**Chapter 5** further explores the relationship between social vulnerability and psychosocial functioning, including peer interactions (peer victimisation, bullying
behaviour, prosocial behaviours) and psychological maladjustment (internalising symptoms, externalising behaviours), in typically developing children by employing a longitudinal study design. This chapter has been prepared for publication.

Chapter 6 consists of a general discussion of the findings indicated throughout the thesis. Limitations of the studies and directions for future research are also discussed, as well as implications of the findings with reference to clinical psychology.
Chapter 1  General Introduction
Social interactions represent a significant part of our everyday lives, with much of our thought and activity dominated by the social domain (Beauchamp & Anderson, 2010; Saltzman-Benaiah & Lalonde, 2007). For children, experiences with peers constitute an important developmental context (Harris, 1995; Rubin, Bukowski, & Parker, 2006). Unsurprisingly, the central role that peer relationships play in facilitating children’s development has long been discussed by developmental psychologists. For example, Piaget (1932) suggested that children’s interactions with their peers allowed them to explore ideas, experience an opportunity, learn to negotiate and discuss multiple perspectives, and develop the ability to compromise; skills they might not develop in their relationships with adults. Additionally, Vygotsky (1978) proposed that cooperation with peers during social interactions was key to facilitating cognitive development and growth.

According to social learning theory, children learn behaviours through observing others, particularly from those who are similar to themselves (Bandura & Walters, 1963). Moreover, children are purported to act as the behavioural control agents for one another, reinforcing behaviours that are considered to be competent and appropriate, and punishing or ignoring behaviours that do not fit within the social norm (Bandura & Walters, 1963; Harris, 1995; Rubin et al., 2006). Supporting this, it has been demonstrated that children who are withdrawn are less rejected in groups of withdrawn children than in groups of aggressive children, with the opposite being true for aggressive children (Boivin, Dodge, & Coie, 1995; Chang, 2004; Stormshak, Bierman, Bruschi, Dodge, & Coie, 1999; Wright, Giammarino, & Parad, 1986). Consequently, it is the social norm of a behaviour that is purported to facilitate peer acceptance (Chang, 2004; Wright et al., 1986).

By middle childhood, it is estimated that approximately 30% of children’s social interactions involve peers (Gifford-Smith & Brownell, 2003; Rubin et al., 2006).
Further to this, peer groups enlarge, are often less supervised by adults, occur in settings outside of the home and classroom, and become more diverse and complex over the course of development (Gifford-Smith & Brownell, 2003; Rubin et al., 2006). These unique features of peer relationships during middle childhood distinguish children’s interactions with their peers from other socialisation experiences (Gifford-Smith & Brownell, 2003). Through these experiences, children develop a range of attitudes, behaviours and skills that influence their development during the lifespan (Rubin et al., 2006). Importantly, experiences within this context are thought to impact social, emotional and cognitive functioning beyond the influences of the family (Harris, 1995; Rubin et al., 2006). Although this viewpoint has been criticised as it is thought to discount the influence of parents on children’s development (Vandell, 2000), it nonetheless highlights the important developmental context provided by social interactions for children.

Not surprisingly then, the abilities to function effectively in social situations and to establish successful interpersonal relationships are believed to be among the most important tasks of child development (Fenning, Baker, & Juvonen, 2011). Our early social experiences in childhood are critical for later adaptive functioning (Cicchetti & Cohen, 1995), with poor social functioning linked to adjustment problems, including poor emotional, behavioural and school adjustment (Arseneault et al., 2006; Haltigan & Vaillancourt, 2014; Malecki & Elliot, 2002; Parker & Asher, 1987; Wolke, Copeland, Angold, & Costello, 2013). Social competence (i.e., the ability to function effectively in social situations), involves a dynamic interplay between the individual and the social environment within which the interaction occurs (Dodge, Pettit, McClaskey, Brown, & Gottman, 1986; Rose-Krasnor, 1997). Social success is determined by how others respond to the individual’s behaviour and is context-dependent, as what may be considered socially competent in one situation, may not be in another (Dodge et al.,
Consequently, social competence is often measured by peer acceptance, that is, likeability or social acceptance by peers (e.g., popularity or rejection), or number of friendships.

At the most fundamental level, social competence involves the application of social-cognitive skills and social skills to social situations. Social cognition refers to the cognitive processes that are used to perceive and process social cues, stimuli and environments (Beauchamp & Anderson, 2010). It is the capacity of an individual to perceive socially relevant information, requiring individuals to understand and interpret given interpersonal situations with regard to the implications for the person and/or situation (Weis & Süß, 2007). Social cognition is a broad domain that incorporates a number of skills and abilities, including social interpretation and problem solving, role taking, emotion perception and theory of mind (Marton, Abramoff, & Rosenzweig, 2005). These skills are crucial for the application of social skills to social interactions, and consequently, for effective social interactions (Beauchamp & Anderson, 2010).

Many of us take for granted the skills that are involved in effective social interactions, as, for most of us, these skills develop naturally and do not require specific attention or training (Saltzman-Benaiah & Lalonde, 2007). However, for others this is not the case. Of the many skills that are required for successful social outcomes, one that is considered to be a fundamental feature of social interactions is the ability to trust (Bernath & Feshbach, 1996; Rotter, 1980).

**Trust**

Trust is defined as the generalised expectancy that other individuals will keep their word or promises (Rotter, 1967). Through continued exposure to situations where this expectation is validated, individuals learn to expect that the social partner will keep their word in the future, and this trust is then extended to other social partners (Bernath & Feshbach, 1996; Rotter, 1980). Trust is important because from an early age we rely
on those around us to learn, develop an understanding of the social world, and develop social relationships (Betts & Rotenberg, 2008; Mills, 2013). Additionally, the establishment and maintenance of interpersonal relationships has been suggested to depend on children’s propensity to trust others (Betts & Rotenberg, 2008; Rotter, 1980; Rotenberg, 2010).

The view that trust affects children’s psychosocial functioning has long been held by contemporary developmental psychologists. It has been suggested that the quality of interactions between infants and their caregivers influences interpersonal trust, which subsequently impacts further social relationships throughout the course of development (e.g., Bernath & Feshbach, 1996; Erikson, 1963). Empirical research has supported these claims. Studies have demonstrated that children’s trust beliefs are positively associated with a wide range of positive psychosocial outcomes, such as social status (Betts & Rotenberg, 2008; Wentzel, 1991), prosocial behaviour (Rotenberg, Fox, et al., 2005; Wentzel, 1991) and effective interpersonal problem solving (Wentzel, 1991). Moreover, holding low trust beliefs in others has been associated with negative psychosocial outcomes, including social difficulties (e.g., lower peer acceptance, greater peer exclusion, lower self-perceived social acceptance, fewer friendships; Rotenberg, Boulton, & Fox, 2005, Betts, Rotenberg, & Trueman, 2009) and internalised maladjustment (e.g., depressive symptoms, anxiety, loneliness; Betts et al., 2009; Rotenberg et al., 2010; Rotenberg, Boulton, et al., 2005; Rotenberg, MacDonald, & King, 2004). Rotenberg, Boulton, et al. (2005) suggested that holding low trust beliefs impacts the development of peer relationships because children adopt a cynical attitude towards their peers. That is, they believe that their peers will not fulfil promises or maintain confidentiality, and therefore behave in a manner consistent with this orientation. Consequently, these children may be less likely to form and maintain social relationships (Rotenberg, Boulton et al., 2005).
However, trust should not be regarded as universally “good.” Rotenberg, Boulton, et al. (2005) posited that children’s trust beliefs have a curvilinear relationship with psychosocial adjustment. Specifically, they hypothesised that an excessively trusting, naïve orientation, would predispose children to being betrayed by their peers because their expectations that peers fulfil promises and maintain confidentiality would likely exceed the frequency with which this occurs. Rotenberg, Boulton, et al. (2005) proposed and found support for the contention that such children would experience greater levels of internalised maladjustment, including loneliness, anxiety and depressive symptoms. Children who held very high trust beliefs, like children who held very low trust beliefs (i.e., displaying a cynical orientation in comparison to the group norm), were also lower in social preference and higher in social exclusion than their peers. Furthermore, longitudinal data demonstrated that children who held very high (as well as very low) trust beliefs in their peers showed greater increases in internalised maladjustment and decreases in self-perceived social acceptance 6 months later. A similar finding was indicated by Betts and colleagues (2009), whereby children who held trusts beliefs that were either low or high in comparison to their peers reported greater levels of loneliness and fewer reciprocal friendships. Rotenberg, Boulton, et al. (2005) argued that children who hold low or high trust beliefs in comparison to their peers are rejected and excluded by the peer group because they deviate from group norms. Specifically, the authors suggested that holding very low trust beliefs and behaving as though their peers will not fulfil promises or maintain confidentiality, and holding very high trust beliefs and behaving as though peers almost always fulfil promises and maintain confidentiality, substantively deviates from the norms of the peer group. This then places children at risk for experiencing problems in psychosocial functioning. Consequently, developing the ability to ascertain when not to trust may be just as important as acquiring the ability to trust.
Critical Stance

It is of no surprise, then, that researchers have discussed the importance of developing a critical stance. Critical stance refers to the ability to critically evaluate information, filter out misinformation from accurate information, and distinguish who should be trusted from who should not be (Mills, 2013). Children are often considered to be credulous and gullible; believing in fantastical characters, displaying magical thinking, and holding grandiose ideas about their capabilities (Mills, 2013). Indeed, children are often encouraged by society to believe in invisible beings, with common examples including Santa Claus, the tooth fairy, and God. Although it has been argued that believing everything, even to the point of gullibility, is adaptive to enable children to learn information quickly and efficiently (Dawkins, 1993), acquiring the ability to doubt is likewise essential as we are frequently presented with information from many sources which may not necessarily be accurate (Mills, 2013).

Research has demonstrated that individuals have a tendency to trust new information if they have no clear reason to doubt; however, what counts as a clear reason to doubt differs across development and across individuals (Mills, 2013). Developmental literature indicates that from a young age, children are able to distinguish between those who should be trusted from those who should not be (see Mills, 2013). For example, before the age of 4, children demonstrate an ability—albeit limited—to critically evaluate information. That is, they show some ability to discount claims made by informants who express uncertainty, lack relevant knowledge, are mean, and who have made inaccurate claims in the past (e.g., Harris, 2007; Mills, 2013). As children age, their ability to critically evaluate information, and therefore, select who should and should not be trusted improves. They develop the ability to understand deception, notice subtleties in communication, understand the impact of past actions, intention, and motivation on behaviour, consequently, their ability to evaluate
information improves (see Mills, 2013, for a review). For example, Vanderbilt, Liu, and Heyman (2011) demonstrated that 5-year olds’ selective trust of helpful over deceptive sources was more advanced than 3- to 4-year olds’. Further to this, Mills and Elashi (2014) demonstrated that when the complexity of the deceit increased, older children were more accurate at detecting distortion than younger children. Similarly, Lapan, Boseovski, and Blincoe (2016) demonstrated that older children were less susceptible to believing misinformation from trusted or knowledgeable sources (in this case, a teacher) than younger children.

Mills (2013) attributed this improvement in the development of a critical stance to a number of factors, including improvements in cognition, and in particular, social cognition. Several studies have supported this assertion, demonstrating an association between more advanced social cognitive skills and the ability to detect deceit (Fusaro & Harris, 2008; Mills & Elashi, 2014; Vanderbilt et al., 2011). For example, in preschool-aged children, Vanderbilt et al. (2011) found an association between more advanced understanding of mental states and children’s selective trust. Likewise, in primary-school aged children, Mills and Elashi (2014) found that both general intelligence and advanced social cognitive skills were associated with children’s ability to detect distortion. However, researchers have also demonstrated that even young children who could not pass a false belief task were able to detect whether someone had made a false claim (Pasquini, Corriveau, Koenig, & Harris, 2007), highlighting that there are other factors that influence children’s ability to evaluate information. Together, these studies demonstrate that critical stance (i.e., being able to evaluate information and select who should be trusted from who should not) is a complex process that depends on both characteristics that are internal to the individual (e.g., age, intelligence, social cognition) and to the informant themselves (e.g., their knowledge, past accuracy, intentions).
Social Vulnerability

The literature on critical stance suggests that children at a young age are still developing a critical stance, which might be important for success in social situations. In social interactions, the ability to detect deceit is likely to be important because difficulties understanding situations that involve deception may leave an individual open to being deceived, misled, or cheated (Greenspan, Loughlin, & Black, 2001). Such ideas have been proposed and discussed by Greenspan et al. (2001), who suggested that survival in the social world requires the ability to identify situations where involvement may lead to negative consequences. An impaired ability to detect or avoid potentially harmful interpersonal interactions is referred to as social vulnerability (Pinsker, Stone, Pachana, & Greenspan, 2006). Although social vulnerability and critical stance appear to be closely related, critical stance is a broad construct that encompasses the ability to evaluate information and distinguish between sources that are trustworthy. Social vulnerability, on the other hand, is more specific to social interactions, and refers to the ability to detect interpersonal exchanges that may involve being deceived, misled or cheated.

Theoretically, two constructs have been purported to underlie social vulnerability: credulity (i.e., a tendency to believe something that is highly questionable despite limited evidence) and gullibility (i.e., a vulnerability to being tricked or manipulated) (Greenspan et al., 2001). These two constructs are thought to be closely related in that the presence of credulity invariably leads to a gullible outcome (Greenspan et al., 2001). As a result, being socially vulnerable is believed to diminish a person’s capacity to interact in social situations and to contribute to negative interpersonal experiences, such as victimisation. Much literature has discussed the dangers of being overly trusting in social exchanges. For example, *The Adventures of Pinocchio*, *Othello*, and even the *Bible* (with one of the most well-known stories being
Eve in the Book of Genesis), demonstrate and serve to warn others about the consequences of being gullible.

To date, however, this concept has received little empirical attention in child developmental psychology. Older adults, people with developmental disabilities, and young children have been purported to be more credulous and gullible, and consequently more socially vulnerable (Greenspan, 2009; Greenspan et al., 2001; Nettelbeck & Wilson, 2002). Greenspan et al. (2001) and Greenspan (2009) hypothesised that this may be due to impairments (or limitations) in social-cognitive functioning within these populations, hence impairing the ability to evaluate false claims and identify dangerous situations. According to Greenspan et al. (2001), the risk of social vulnerability is influenced by both the environment and a range of personal competence factors (e.g., general intelligence, social intelligence, communication, personality/motivation, and physical competence). When presented with a potentially challenging situation, such as a coercive or persuasive situation, the interactions between the situation and these personal competence factors are what are thought to contribute to successful or unsuccessful adaptation.

Using individuals with developmental disabilities as an example, Greenspan et al. (2001) suggested that such individuals may lack the cognitive processing ability required to accurately evaluate false claims, and may also lack the perspective-taking capacity to see through exploiters, or the social insight to label situations as dangerous (Greenspan et al., 2001). In addition, Greenspan et al. (2001) suggested that these individuals may have personality characteristics (specifically, an ‘external’ and compliant orientation) which cause them to model their behaviour on the behaviour of others. Consequently, when faced with an exploitative situation, the combination of these personal competency factors may contribute to unsuccessful adaption. However, it is important to note that Greenspan’s (2009) conclusions regarding the presence of
credulity and gullibility in individuals with developmental disorders are based solely on observational case studies.

Empirical research has since provided some support for these claims in samples at social-cognitive risk (e.g., Fisher, Moskowitz, & Hodapp, 2012; Fisher, Moskowitz, & Hodapp, 2013; Pinsker, 2011; Pinsker & McFarland, 2010; Pinsker et al., 2006; Sofronoff, Dark, & Stone, 2011). Pinsker and colleagues investigated social vulnerability in older adults across a number of studies (Pinsker, 2011; Pinsker & McFarland, 2010; Pinsker, McFarland, & Pachana, 2010; Pinsker, McFarland, & Stone, 2011; Pinsker et al., 2006). This was based on the assertion that older adults are susceptible to being exploited, particularly in regard to financial situations. Pinsker et al. (2006) and Pinsker et al. (2011) demonstrated that older adults with a neurological condition or memory impairment were rated, on average, as being more socially vulnerable than healthy older adults. Pinsker et al. (2006, 2010) hypothesised that it was not old age per se that predisposes a person to exploitation, but rather an individual’s physical, cognitive (i.e., memory impairment, executive dysfunction) and social capacities (i.e., social intelligence deficit). Consequently, Pinsker et al. (2010) proposed a model of personal competency factors that they thought may underlie an individual’s level of social vulnerability. The domains included general intellectual functioning, cognitive functioning (memory and executive abilities), social intelligence, social skills, personality traits and motivation. Assessment of this model demonstrated that each of these domains, aside from personality, predicted social vulnerability after controlling for impairment and age. However, cognitive functioning (i.e., executive functioning) and social intelligence demonstrated the greatest effect sizes (Pinsker & McFarland, 2010). Accordingly, Pinsker and McFarland (2010) concluded that both neurocognitive and social cognitive deficits (and not age per se) may contribute to social vulnerability in older adults.
In other populations believed to be at risk of experiencing social victimisation, social vulnerability has also been identified as important in explaining risk for exploitation. Across two studies, Fisher and colleagues (2012, 2013) investigated social vulnerability in older adolescents and adults with developmental disabilities (intellectual disability, autism spectrum disorder, William’s syndrome, and Down syndrome). The authors identified high levels of victimisation within these samples, and suggested that there are specific facets of ‘social vulnerability’ (e.g., a decreased ability to detect risk, being perceived by others as being physically vulnerable, and having low social protection from peers) associated with each of these disorders that places these individuals at risk for victimisation (Fisher et al., 2012, 2013). Furthermore, Fisher et al. (2012) demonstrated that for individuals with an intellectual disability, facets of social vulnerability, in particular credulity and emotional bullying, were associated with internalising symptoms and externalising behaviours. This suggests that social vulnerability may not only underlie victimisation in this sample, but that it may also contribute to psychosocial maladjustment.

Finally, Sofronoff et al. (2011) investigated social vulnerability in children with Asperger’s syndrome. Children with Asperger’s syndrome experience a vast array of social difficulties compared to their typically developing peers (e.g., Cappadocia, Weiss, & Pepler, 2012; Rao, Beidel, & Murray, 2008; Rowley et al., 2012; Wainscot, Naylor, Sutcliffe, Tantam, & Williams, 2008). Of these difficulties, bullying is particularly problematic due to its enduring impact on an individual’s psychosocial development (e.g., Arseneault, Bowes, & Shakoor, 2010). Sofronoff et al. (2011) proposed that social vulnerability may be important to understanding the social problems, including bullying, commonly experienced by children with Asperger’s syndrome. Their findings indicated that children with Asperger’s syndrome were rated as being more socially vulnerable than typically developing children. Moreover, they
demonstrated that social vulnerability was associated with social interaction problems (e.g., peer victimisation and poor social skills), as well as emotional/behavioural problems (anger, anxiety, and aggression) in this population. Importantly, social vulnerability was the only unique predictor of peer victimisation. The authors suggested that, for children with Asperger’s syndrome, being credulous and gullible may be considered a particular weakness by their peers, which places them at risk of being deceived or conned.

Together, these studies demonstrate that, across a wide range of development, social vulnerability is associated with psychosocial functioning for those who are socially and/or cognitively compromised. However, the extent to which social vulnerability is an important construct in typically developing children is not yet understood. At present, we have no clear understanding of the cognitive mechanisms that underlie social vulnerability, nor do we have an understanding of the consequences of social vulnerability for psychosocial adjustment in typically developing children. Yet, there is reason to believe that children may be at risk for being deceived and misled in social situations. During the elementary school years, children go through a process of substantial cognitive development (Anderson et al., 2001), during which they might be at risk for being deceived and misled in social situations (Greenspan, 2009; Greenspan et al., 2001). Across a series of case studies, Greenspan (2009) provided examples of how children are easily duped by others and are susceptible to believing misinformation. However, despite the potential for social vulnerability to inform us on children who are at risk in social situations, there has been little empirical work conducted to examine the conclusions drawn by Greenspan (2009). Looking at the broader literature on the development of selective trust and critical stance provides us with some indication that young children may be at risk of heightened social vulnerability, as it is evident that the ability to critically evaluate information and
distinguish who should be trusted from who should not be develops with age. Therefore, to begin to understand social vulnerability in children, a systematic program of research is required, beginning with a scale that reliably and validly measures social vulnerability within this population.

**Measuring social vulnerability**

To date, research on social vulnerability has been accomplished with various scales that were developed specifically for at-risk populations. Pinsker et al. (2006) developed the Social Vulnerability Scale for Older Adults. It is an informant-based rating scale that assesses social vulnerability in older adults based on their day-to-day behaviour, particularly in relation to financial situations. Psychometric evaluation of the scale provided preliminary support for this scale as a psychometrically sound instrument. The scale demonstrated high internal consistency ($\alpha = .92$), as well as strong test-retest reliability at a 1 week interval ($r = .87$). Moreover, Pinsker et al. (2006) demonstrated that social vulnerability scores were higher for neurologically compromised individuals than their healthy peers, providing support for the concurrent validity of the scale. Pinsker et al. (2011) extended these findings and examined the underlying factor structure of the scale. An exploratory factor analysis resulted in a two factor solution; the first factor related to a tendency to believe things that are not true (e.g., “believes things that are clearly untrue”), and the second comprised of items that indicated a susceptibility to being manipulated or deceived (e.g., “persuaded to purchase unneeded items”) – credulity and gullibility, respectively. These findings provide support for Greenspan and colleagues’ (2001) conceptualisation of social vulnerability, distinguishing between the cognitive (credulity) and behavioural (gullibility) facets of susceptibility to exploitation.

Since then, researchers have continued to measure social vulnerability in other at-risk samples (Fisher et al., 2012; Sofronoff et al., 2011). Fisher and colleagues (2012)
designed a scale based on pre-existing measures of bullying, gullibility, abuse and deception to measure potential risk factors for social victimisation in older adolescents and adults with developmental disabilities. Fisher et al. (2012) favoured a 30-item, 6-factor solution of their scale, with the factors indicating emotional bullying, risk awareness, perceived physical vulnerability, social protection and credulity. However, this study was limited as the authors measured a broad array of general risk factors for social vulnerability, and omitted gullibility from the scale. As such, whether social vulnerability, as conceptualised by Greenspan et al. (2001), is in fact higher in these individuals and underlies their risk of victimisation is currently unclear.

Finally, social vulnerability has also been assessed in children with Asperger’s syndrome, with items pertaining to both credulity and gullibility (Sofronoff et al., 2011). Sofronoff and colleagues (2011) developed the Social Vulnerability Scale (SVS) largely based on the Social Vulnerability Scale for Older Adults (Pinsker et al., 2006), but with items about being victimised, either by peers or the child’s teacher (e.g., “been victim of physical bullying” and “treated unkindly by teacher because of difficulties”), also included. An exploratory factor analysis endorsed a two-factor solution that largely corresponded to credulity and gullibility. However, there were notable deviations, as the first factor (gullibility) contained victimisation items (e.g., “been victim of physical bullying”) and the second factor (credulity) contained both credulity and gullibility items (e.g., “believes what he/she is told regardless of the source” and “is easily fooled”). Consequently, these findings raise some doubt as to whether the theoretical conceptualisation of social vulnerability described by Greenspan et al. (2001) is applicable to children. Moreover, this scale was specifically developed for children with a disability and contains items that are not applicable for typically developing children (e.g., “excluded from activity by a teacher because of difficulties”).
Although a number of scales have been developed to measure social vulnerability, all of these scales were developed specifically for populations at social-cognitive risk, and are not appropriate for assessing social vulnerability in typically developing children. In order to systematically investigate social vulnerability in typically developing children, a scale first needs to be developed. There has been one investigation into the application of another scale, the Social Vulnerability Rating Instrument - Children’s Version (SVRI-CV; Bianco, 2012), with typically developing children. The SVRI-CV is a 20-item parent-report measure of social vulnerability that was developed for children and used to assess social vulnerability in a neurologically compromised paediatric population. It was based on the Social Vulnerability Scale for Older Adults (Pinsker et al., 2006), and was developed independently to the Social Vulnerability Scale (Sofronoff et al., 2011). In a preliminary investigation, parents of 232 typically developing primary school-aged children (Kindergarten – Year 7) completed the scale. Psychometric analysis provided some initial support for the use of the SVRI-CV with typically developing children. Results demonstrated good internal reliability (Cronbach’s alpha = .85) and high test-retest reliability at a four week interval ($r = .93$), suggesting that it is a psychometrically reliable tool for measuring social vulnerability in a typically developing population. However, Bianco (2012) identified a number of items that displayed poor item-total correlations, and did not examine the factor structure of the instrument. Furthermore, an extensive examination of the psychometric properties of the scale was not conducted. Although the results from Bianco (2012) provide promising support for using the SVRI-CV as a measure of social vulnerability in typically developing children, further exploration and investigation into this scale is required to determine whether it is appropriate.
Cognitive mechanisms underlying social vulnerability

Given the limited research on social vulnerability in typically developing children, and in order to understand this construct from a developmental perspective, the current research will aim to identify potential cognitive mechanisms that may underlie social vulnerability. Greenspan (2009) attributed the tendency for children to be socially vulnerable to their limited cognitive development, and suggested that this gullibility typically declines with age as a function of both advances in cognitive development and increasing social exposure. Although there has been no empirical research on this to date, theoretical conceptualisations and empirical research in other populations can provide us with some indication as to which cognitive mechanisms may underlie social vulnerability.

Greenspan et al. (2001) suggested that impaired intellectual functioning contributes to socially vulnerable behaviours because such impairments may limit the ability to evaluate false claims. Research into critical stance has provided support for this suggestion, demonstrating that general intelligence is important for understanding where to appropriately place trust (Mills & Elashi, 2014). However, this research has also demonstrated that there are other cognitive mechanisms, such as social cognition, that are associated with a more advanced critical stance (Fusaro & Harris, 2008; Mills & Elashi, 2014; Vanderbilt et al., 2011). Likewise, Greenspan et al. (2001) highlighted that although individuals with developmental disabilities may experience difficulties in everyday social understanding, performance on general cognitive assessments does not always fall below the average range, thus implying that cognitive mechanisms other than decreased cognitive ability may account for elevated levels of social vulnerability. Consequently, Greenspan et al. (2001) proposed that social intelligence and communication may be other aspects of cognition that also underlie social vulnerability.
Both Sofronoff et al. (2011) and Pinsker and McFarland (2010) provide support for the role that social intelligence and communication may play in explaining social vulnerability. For example, impairments in general intellectual functioning cannot explain the increased levels of social vulnerability evident in children with Asperger’s syndrome, as these children have increased levels of social vulnerability despite average levels of intelligence (Holdnack, Goldstein, & Drozdick, 2011). Sofronoff et al. (2011) made a strong conceptual link between social cognitive deficits, in particular, theory of mind deficits, and social vulnerability. Theory of mind refers to the ability to understand mental states of the self and others, and to understand that others’ mental states can differ from one’s own (Wellman & Liu, 2004). In their study, Sofronoff and colleagues (2011) demonstrated that children with Asperger’s syndrome were rated as more socially vulnerable than typically developing children. They hypothesised that a tendency towards social vulnerability may be attributable to a poorly developed theory of mind, which is evident within this population. Sofronoff and colleagues (2011) suggested that individuals with Asperger’s syndrome may lack the ability to detect social cues that indicate deceit, placing them at risk of being exploited. More generally, it has been proposed that children with an autism spectrum disorder (ASD) may be at greater risk for negative interpersonal interactions than their typically developing peers due to socio-communicative difficulties (Cappadocia et al., 2012). Competent communication is considered to be a protective factor in the face of negative peer interactions (Cappadocia et al., 2012), and so difficulties communicating effectively may place individuals at an increased risk for experiencing social difficulties.

Research into social vulnerability in older adults also provides support for the role that cognitive mechanisms, aside from general intellectual ability, may play in social vulnerability. Pinsker and McFarland (2010) demonstrated that both neurocognitive (i.e., executive functioning and memory deficits) and social cognitive
deficits, and not age per se, contribute to social vulnerability in older adults. Moreover, the authors suggested that language may also be important to understanding social vulnerability. They hypothesised that someone with diminished verbal abilities may be at an increased risk of being socially vulnerable due to difficulty communicating with others and understanding social exchanges.

As such, currently it is unclear whether social vulnerability is related to general intellectual ability, or whether it is independent of intellectual ability and related to more specific cognitive abilities. Together, theoretical conceptualisations and past empirical research in at-risk populations suggests that social cognition, language ability and executive functioning may be specific cognitive abilities that underlie social vulnerability. However, the extent to which these associations extend to typically developing children remains unknown. Each of these cognitive mechanisms and their possible association with social vulnerability in typically developing children is discussed below.

**Social cognition.** The development of social-cognitive intelligence is an important aspect of child development, with longitudinal studies providing a directional relationship between more advanced social-cognitive skills and better adaptive outcomes (e.g., Crick & Dodge, 1994; Denham et al., 2003; Fenning et al., 2011). One particular aspect of social cognition that may be of importance to understanding social vulnerability is theory of mind. Theory of mind has consistently been associated with successful social interactions throughout childhood, with the capacity to understand the intentions of individuals in a social situation purported to be crucial for successful social-problem solving and interpersonal communication (Uekermann et al., 2010). Although theory of mind (as measured by first- and second-order belief tasks) has been reported to develop by preschool (e.g., Carlson, Moses, & Breton, 2002; Saltzman-Benaiah & Lalonde, 2007), this should be thought of as a relatively early point in the
development of these skills. Indeed, the preschool period represents a significant developmental shift in theory of mind capacity (Wellman, Cross, & Watson, 2001); however, these skills continue to become increasingly sophisticated throughout childhood, with children developing the capacity to understand more advanced aspects of theory of mind, such as the detection of sarcasm and irony (Peterson, Wellman, & Slaughter, 2012).

Researchers have demonstrated that more advanced theory of mind skills are associated with increased prosocial behaviour (Caputi, Lecce, Pagnin, & Banerjee, 2012; Watson, Nixon, Wilson, & Capage, 1999). A recent meta-analysis indicated a small but significant correlation between theory of mind and prosocial behaviour in children aged 2- to 12-years old, with the strength of the relationship stronger for 6- to 12-year old children relative to their younger peers (Imuta, Henry, Slaughter, Seluk, & Ruffman, 2016). Additionally, theory of mind has been positively linked to peer acceptance (Banerjee, Watling, & Caputi, 2011; Slaughter, Dennis, & Pritchard, 2002) and reciprocated friendships (Fink, Begeer, Peterson, Slaughter, & Rosnay, 2015), and negatively linked to peer victimisation and aggression (Shakoor et al., 2012). Together, this research highlights that the acquisition of theory of mind is important for social functioning in children.

As suggested by Sofronoff et al. (2011), the capacity to develop an understanding that the thoughts and actions of others may be different to one’s own (that is, theory of mind), and the ability to use this understanding to avoid being manipulated and deceived, is an aspect of social cognition that may be related to social vulnerability. In support of this hypothesis, researchers have demonstrated that theory of mind is associated with the ability to detect deceit (e.g., Mills & Elashi, 2014; Vanderbilt et al., 2011). This research highlights the potential importance of theory of mind to understanding the social motives of an individual, and lends support to the
hypothesis that this ability may be necessary to avoid being manipulated and deceived. Therefore, given the well-documented association between theory of mind and successful social interactions in children, as well as the strong conceptual links between social vulnerability and theory of mind (Greenspan et al., 2001; Sofronoff et al., 2011), it is possible that theory of mind may be a cognitive mechanism that underlies social vulnerability.

**Executive functioning.** Executive functions refer to a broad range of abilities that are involved in higher-order cognitive processes. While specific definitions vary, there is a general consensus that executive functions comprise related, yet separable abilities that enable intentional, goal-directed behaviour (Lehto, Juujärvi, Kooistra, & Pulkkinen, 2003). Although there are a number of theories regarding the structure of executive functions, the Miyake et al. (2000) model is widely cited as the seminal model. This model proposes that ‘inhibition,’ the ability to suppress an automatic response; ‘shifting,’ the ability to switch between different tasks or rules; and ‘updating,’ monitoring and updating of working memory representations, are the three underlying executive functions that, collectively, are involved in a range of higher-order functions, such as planning, problem solving and performance maintenance (Miyake et al., 2000; Zelazo, Carter, Reznick, & Frye, 1997). Executive functions develop throughout childhood, with research suggesting that the first 5 years of life play a critical role in the development of these skills, which then form a foundation for the development of higher-order cognitive processes into adolescence and adulthood (Garon, Bryson, & Smith, 2008).

Executive functions are purported to play a central role in social competence, as such skills are critical for efficient functioning in everyday life, including the development of appropriate social skills and facilitation of social interactions (Beauchamp & Anderson, 2010). A robust amount of evidence links executive
dysfunction to an array of social, emotional and behavioural problems during childhood (e.g., Ghassabian et al., 2014; Hughes & Ensor, 2008; Hughes & Ensor, 2011; Schoemaker, Mulder, Deković, & Matthys, 2013; Verlinden et al., 2014). Importantly, poorer executive functioning has been associated with fewer prosocial behaviours (Diamantopoulou, Rydell, Thorell, & Bohlin, 2007), an increased risk of being involved in bullying and victimisation (Verlinden et al., 2014), and lower social competence two years later (Nigg, Quamma, Greenberg, & Kusche, 1999). Moreover, there is a vast amount of research linking executive functioning to theory of mind, with studies demonstrating that executive functioning is related to both the emergence of theory of mind in early childhood (Carlson et al., 2002; Carlson, Moses, & Claxton, 2004; Hughes & Ensor, 2007), and the development of complex aspects of social understanding across childhood (Bock, Gallaway, & Hund, 2015).

Although a detailed discussion of executive functions is beyond the scope of this thesis, the literature outlined demonstrates that executive functions are associated with the emergence of social competence in children, as well as the development of social-cognitive skills. With this in mind, executive functions may be a cognitive mechanism related to social vulnerability, either directly or indirectly via their relationship with social cognition.

**Language.** Verbal communication forms the foundation of our social relationships, providing the basis by which we experience thought, intention, and information (Beauchamp & Anderson, 2010). It is of no surprise, then, that weaker language skills have been associated with social difficulties, such as, peer rejection (Menting, Van Lier, & Koot, 2011), and reduced social skills and social preference (Mostow, Izard, Fine, & Trentacosta, 2002). Likewise, children with language difficulties are at an increased risk for social difficulties compared to typically developing children, including problems such as social withdrawal, poorer quality of
friendships and peer victimisation (Botting & Conti-Ramsden, 2008; Conti-Ramsden & Botting, 2004; Durkin & Conti-Ramsden, 2010; Hart, Fujiki, Brinton, & Hart, 2004). These difficulties become apparent in early childhood (Gertner, Rice, & Hadley, 1994) and often endure throughout the school years (Snowling, Bishop, Stothard, Chipchase, & Kaplan, 2006; St Clair, Pickles, Durkin, & Conti-Ramsden, 2011).

In addition, language has been demonstrated to play a causal role in the development of children’s social understanding. There is an abundance of research indicating a relationship between language ability and theory of mind (e.g., Astington & Jenkins, 1999; Filippova & Astington, 2008), with a meta-analysis by Milligan, Astington, and Dack (2007) demonstrating that in young children (before 7-years of age), language task performance was predictive of later performance on false-belief tasks. Similarly, researchers have demonstrated that language task performance predicts more advanced aspects of social understanding, such as sarcasm and irony (Filippova & Astington, 2008; Peterson et al., 2012). Moreover, language impairments are associated with impairments in the development of social cognition (Astoning & Jenkins, 1995; Cohen et al., 1998; Farmer, 2003; Ford & Milosky, 2003). For example, Cohen et al. (1998) demonstrated that children with language impairments exhibit greater deficits in social cognitive processing, particularly in social problem solving situations, than typically developing peers.

The importance of language for the establishment of interpersonal relationships is well recognised, as is the association between language and social understanding. Consequently, given the extensive literature on the relationship between social competence, social cognition and language, it is plausible that language development is associated with social vulnerability.
**Psychosocial consequences of social vulnerability**

The final aim of the current research is to enhance our understanding of the psychosocial consequences of social vulnerability in typically developing children. In at-risk populations, social vulnerability has been linked to poor psychosocial functioning. For example, in adolescents and adults with an intellectual disability, Fisher et al. (2012) demonstrated that facets of social vulnerability, in particular, credulity, were associated with internalising behaviours and externalising behaviours. Moreover, the authors hypothesised that social vulnerability may be what places individuals with developmental disabilities at risk for experiencing greater levels of victimisation (Fisher et al., 2012, 2013), albeit they did not specifically test this hypothesis. In children with Asperger’s syndrome, Sofronoff and colleagues (2011) found that social vulnerability was associated with poor social skills, and higher levels of anxiety, anger, behavioural problems and peer victimisation. Furthermore, when considered alongside ratings of anxiety, anger, behavioural problems and social skills, social vulnerability was the only factor to significantly predict peer victimisation in this population. Together, these studies suggest that across development, in at-risk populations, social vulnerability is associated with psychosocial maladjustment. However, the extent to which these relationships apply to typically developing children is unknown and warrants further investigation.

Understanding the psychosocial consequences of social vulnerability in children is important because social, emotional and behavioural problems are prevalent. Current estimates indicate that approximately 10-15% of children have significant mental health problems or disorders (Merikangas et al., 2010; Sawyer et al., 2001), with research demonstrating that for many of these children these problems persist into adolescence and adulthood (Kessler et al., 2005; Merikangas et al., 2010). Notably, the onset of approximately 50% of cases of severe mental health problems is estimated to occur
prior to 14-years of age (Kessler et al., 2005). Therefore, identifying factors that are associated with the development of emotional and behavioural problems amongst children is crucial so that interventions can be implemented to prevent such problems from developing into more severe psychiatric disorders. As such, considering social vulnerability in typically developing children may help us to understand how children relate to each other in ways that are not currently captured in measures of social skills or peer problems, but which may influence their social, emotional and behavioural wellbeing.

Of particular interest is the relationship between social vulnerability and peer victimisation. As discussed, effective social functioning during childhood is critical for later adaptive functioning (e.g., Arseneault et al., 2006; Haltigan & Vaillancourt, 2014; Malecki & Elliot, 2002; Parker & Asher, 1987; Wolke et al., 2013). Being accepted by peers, having friends, and having positive interactions with peers are all aspects of social functioning that are associated with psychosocial adjustment (Gifford-Smith & Brownell, 2003). Involvement in bullying, on the other hand, is an aspect of social functioning that has consistently been associated with adjustment problems (e.g., Arseneault et al., 2010; Crick & Bigbee, 1998; Espelage & Holt, 2013; Hawker & Boulton, 2000; Nansel, Craig, Overpeck, Saluja, & Ruan, 2004). Bullying is a pervasive problem, with worldwide prevalence rates indicating that 10% to 30% of children are involved in bullying (Analitis et al., 2009; Berger, 2007; Nansel et al., 2004). Moreover, children who are involved in bullying manifest adjustment problems, many of which persist into adolescence (e.g., Arseneault et al., 2010; Espelage & Holt, 2013; Haltigan & Vaillancourt, 2014; Hanish & Guerra, 2002; Hawker & Boulton, 2000; Nansel et al., 2004). Consequently, of the many possible social consequences of social vulnerability, bullying and victimisation are perhaps the most problematic. Therefore, investigation into the relationship between social vulnerability and peer victimisation, as well as the
relationship between social vulnerability and psychosocial adjustment, is required in order to enhance our understanding as to whether social vulnerability may be a specific facet of social skills that underlies these difficulties in typically developing children.

**Overview of the Current Research**

Given the potential for social vulnerability to provide us with insight into which children may be at risk in social situations, the dearth of research on social vulnerability in typically developing children is surprising. There remains no published scale for measuring social vulnerability in typically developing children, nor a substantive understanding of the cognitive mechanisms that underlie social vulnerability. Additionally, research is required to enhance our understanding of the relationship between social vulnerability and psychosocial functioning (i.e., peer interactions and psychological adjustment) in children. As such, a systematic program of research is required to address these fundamental issues. Consequently, the aim of this thesis was to address these gaps in the literature in order to extend our current understanding of social vulnerability in typically developing children.

To take steps towards understanding social vulnerability in children, a social vulnerability measure for typically developing children first needs to be established. Currently, only one scale has been utilised for measuring social vulnerability in typically developing children (i.e., the SVRI-CV; Bianco, 2012). However, the investigation into the reliability and validity of this scale was limited, and the factor structure of the instrument is yet to be examined. Hence, Chapter 2 presents a study describing the development of an instrument suitable for assessing social vulnerability in typically developing children. This study outlines the construction of the scale, and includes an exploration of the factor structure and examination of psychometric properties. Furthermore, this study explores age-related differences in social
vulnerability in typically developing children, and presents a clinical case study on levels of social vulnerability amongst children with clinical needs.

In Chapter 3, the cognitive mechanisms associated with social vulnerability in typically developing children are explored. Specifically, the study aimed to test the contributions of theory of mind, executive functioning and language ability in predicting individual differences in social vulnerability in typically developing children.

The next two chapters investigate the link between social vulnerability and peer interactions, and social vulnerability and psychosocial adjustment in children. Chapter 4 explored the relationship between social vulnerability and peer experiences, specifically, peer victimisation and bullying behaviour, testing the unique contribution of social vulnerability to the prediction of these peer experiences after accounting for other psychosocial adjustment variables. Chapter 5 extended this research by employing a longitudinal study design, and exploring a broader array of psychosocial adjustment variables (including internalising problems, externalising problems and social skills). In this study the relationships between social vulnerability and later peer interactions (peer victimisation, bullying behaviour, prosocial skills), and later psychological adjustment (internalising symptoms, externalising behaviours) were examined.

Finally, the results from the four studies contained in the thesis are summarised in the General Discussion. Limitations of the studies are discussed and suggestions for future research are recommended. Lastly, wider implications of the research program with regard to clinical psychology are explored.
References


Botting, N., & Conti-Ramsden, G. (2008). The role of language, social cognition, and social skill in the functional social outcomes of young adolescents with and
without a history of SLI. *British Journal of Developmental Psychology, 26*(2), 281-300. doi: 10.1348/02615107X235891


Chapter 2

The Children’s Social Vulnerability Questionnaire: Validation, relationship with psychosocial functioning, and age-related differences

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Abstract

Parents have long warned their children about being misled by others. Difficulties detecting or avoiding potentially harmful interpersonal situations is referred to as social vulnerability. Despite the potential for social vulnerability to inform us on children who are at risk in social situations, empirical research investigating this construct is scarce. With this in mind, we aimed to a) develop the Children’s Social Vulnerability Questionnaire (CSVQ), a brief measure for assessing social vulnerability in typically developing children, b) examine the relationship between social vulnerability and psychosocial functioning, c) explore age-related differences, and d) explore levels of social vulnerability amongst children with clinical needs. Data were gathered on two samples. Participants were parents (\( n = 902 \)) of Australian elementary school-aged children (3- to 12-years), and parents and teachers of a local sample of Australian children (\( n = 96 \)). Results provide strong evidence for the reliability and validity of the CSVQ. Importantly, social vulnerability showed moderate relationships with emotional and behavioural problems. However, social vulnerability showed only a weak relationship with social skills, indicating that social vulnerability is not merely a lack of social skills. Parents perceived greater social vulnerability in younger than older children and amongst children with clinical needs, and their scores correlated with teachers’ scores. Together, the results provide support for social vulnerability as a psychosocial construct that has the potential to provide us with greater insight into social exchanges.

KEYWORDS: Social vulnerability, measurement, peer interactions, psychosocial adjustment, children.
For generations, children have been cautioned about the perils of being duped by others. Many parents warn their children, “I think he’s just using you,” or “she’s being nice so you’ll invite her to your party.” Similarly, from *Little Red Riding Hood* to *The Adventures of Pinocchio*, much of children’s literature has had a central theme of warning them against the dangers of being overly trusting. However, this concept has received little empirical attention in child and adolescent developmental psychology. This lack of empirical attention is surprising, given that effective functioning in the social world requires the ability to identify situations where involvement may lead to negative consequences (Greenspan, Loughlin, & Black, 2001). Even though a tendency to be trusting is generally considered to be adaptive (Betts & Rotenberg, 2008; Rotter, 1980), difficulties understanding situations that involve deception may leave an individual open to being deceived, misled, or cheated (Greenspan et al., 2001). This impaired ability to detect or avoid potentially harmful interpersonal interactions is referred to as social vulnerability (Pinsker, Stone, Pachana, & Greenspan, 2006).

Theoretically, two constructs are purported to underlie social vulnerability: credulity (a tendency to believe something that is highly questionable despite limited evidence) and gullibility (a vulnerability to being tricked or manipulated) (Greenspan et al., 2001). These two constructs are thought to be closely related in that the presence of credulity invariably leads to a gullible outcome (Greenspan et al., 2001). As a result, being socially vulnerable is believed to diminish a person’s capacity to interact in social situations and contribute to negative interpersonal experiences, such as victimisation. It has been purported that older adults, people with developmental disabilities, and young children are more likely to be socially vulnerable (Greenspan, 2009; Greenspan et al., 2001). In children, social vulnerability may manifest as being easily fooled by their
peers or tricked into doing something. Greenspan et al. (2001) and Greenspan (2009) attributed the tendency for children to be socially vulnerable to their limited cognitive development, and suggested that this gullibility typically declines with age as a function of both advances in cognitive development and increasing social exposure. However, these conclusions were based on a series of case studies, and although they seem logical, there has been very little research that has directly addressed these claims.

Despite the limited empirical research on social vulnerability in children, empirical research with other samples believed to be at social-cognitive risk has been more abundant. For example, social vulnerability has been examined in older adults with a neurological condition who are thought to be at risk for financial and social exploitation. As expected, these adults were rated as more socially vulnerable than their healthy peers (Pinsker, McFarland, & Stone, 2011; Pinsker et al., 2006). In older adolescents and adults with developmental disabilities (e.g., intellectual disability, autism spectrum disorder, William’s syndrome and Down syndrome), Fisher et al. (2012, 2013) identified specific facets of ‘social vulnerability’ (e.g., a decreased ability to detect risk, being perceived by others as being physically vulnerable, and having low social protection from peers) associated with each disorder that place individuals within these groups at risk for victimisation (Fisher, Moskowitz, & Hodapp, 2012, 2013). Finally, children with Asperger’s syndrome, who have known social problems, have been rated as being more socially vulnerable than typically developing children (Sofronoff et al., 2011). Importantly, for these children, social vulnerability was associated with social interaction problems (e.g., peer victimisation, poor social skills) and emotional/behavioural problems (anger, anxiety, and aggression), and was the only unique predictor of peer victimisation. Together, these studies demonstrate that, across a wide range of development, social vulnerability is elevated in those who experience
social-cognitive difficulties, and is an important predictor of psychosocial and interpersonal difficulties.

Young children who are developing typically, nonetheless, may also be at risk for being deceived and misled in social situations, as they are still developing their social and cognitive abilities. In the elementary school years, children go through a process of substantial cognitive development (Anderson et al., 2001). While in the process of developing their cognitive and social abilities, they may be socially vulnerable to interactions that are intended to harm (Greenspan, 2009; Greenspan et al., 2001). Considering social vulnerability in typically developing children may help us to understand how children relate to each other in ways that are not captured in current measures of social skills or peer problems, but which may influence their social, emotional and behavioural wellbeing. Despite the potential for social vulnerability to inform us on children who are at risk for being taken advantage of in social situations, there has been no empirical research in this population. Part of this may be due to the lack of an appropriate measure for this population. Hence, in order to facilitate research on social vulnerability in typically developing children, a scale first needs to be developed.

Given the focus on assessing social vulnerability in individuals that have social-cognitive deficits to date, research on social vulnerability has been assessed using scales that were developed specifically for at-risk populations. For example, Pinsker et al. (2006) developed an informant-rated scale to measure older adults susceptibility to exploitation in financial situations – The Social Vulnerability Scale for Older Adults. Consistent with Greenspan et al.’s (2001) theory, Pinsker et al. (2011) found a two factor structure: one factor was related to credulity (i.e., a susceptibility to believing questionable claims, with items such as, “believes things that are clearly untrue”), and a second to gullibility (i.e., a susceptibility to being manipulated or deceived, with items
such as, “persuaded to purchase unneeded items”). A separate measure of social vulnerability was developed by Fisher and colleagues (2012) based on pre-existing measures of bullying, gullibility, abuse and deception, for older adolescents and adults with developmental disabilities. In this scale, six factors were found, representing emotional bullying, risk awareness, perceived physical vulnerability, social protection and credulity. Importantly, gullibility was omitted from the scale. Finally, the Social Vulnerability Scale (SVS; Sofronoff et al., 2011) was developed for children with Asperger’s syndrome, based on items from the Social Vulnerability Scale for Older Adults (Pinsker et al., 2006). Items concerning credulity, gullibility and being victimised as a result of the child’s disability, either by peers or the child’s teacher (e.g., “treated unkindly by teacher because of difficulties”) were included. Although a two-factor solution was found, there were notable deviations from the expected differentiation between credulity and gullibility. Specifically, the first factor (gullibility) contained victimisation items and the second factor contained both credulity and gullibility items (e.g., “believes what he/she is told regardless of the source” and “is easily fooled”). Consequently, these findings raise some doubt as to whether the theoretical conceptualisation of social vulnerability described by Greenspan et al. (2001) is applicable to children.

One additional scale – the Social Vulnerability Rating Instrument- Children’s Version (SVRI-CV) – developed for use with children with neurological conditions, was recently used with typically developing children (Bianco, 2012). The SVRI-CV is a 20-item parent report measure of social vulnerability that assesses both credulity and gullibility, based on the Social Vulnerability Scale for Older Adults (Pinsker et al., 2006). Bianco (2012) provided preliminary support for the SVRI-CV in a typically developing Australian elementary school-aged population \( (n = 232) \). Psychometric analysis of the SVRI-CV revealed good internal reliability for the full scale (Cronbach’s
alpha = .85) and high test-retest reliability at a 4 week interval (r = .93), suggesting that it is a psychometrically reliable tool for identifying children who are socially vulnerable in a typically developing population. Results from Bianco (2012) provide promising support for using the SVRI-CV as a measure of social vulnerability in typically developing children, however, Bianco (2012) identified a number of items that displayed poor item-total correlations, and did not examine the factor structure of the instrument.

Given the potential for social vulnerability to provide us with insight into which children may be at risk in social situations, the dearth of research on social vulnerability in typically developing children is surprising. To take steps towards understanding social vulnerability in children, a social vulnerability measure for typically developing children needs to be established. Although Bianco (2012) provided promising support for using the SVRI-CV as a measure of social vulnerability in typically developing children, there are a number of limitations that need to be addressed. With this in mind, the current study aimed to develop a new brief parent-report social vulnerability scale with strong psychometric properties for use with typically developing children, and to then examine whether social vulnerability is an important psychosocial construct in children. This study reports findings on the development of this questionnaire, including the construction of the scale, exploration of its factor structure, and examination of the psychometric properties. We also report findings on the relationship between social vulnerability and psychosocial functioning, using both parents and teachers as reporters. Based on the evidence for this relationship found by Sofronoff et al. (2011), it was expected that social vulnerability would be positively associated with internalising problems and externalising problems, and negatively associated with social skills, providing support for the validity of the scale. Finally, because of the suggestions of Greenspan et al. (2001; 2009) regarding age-related changes in social vulnerability, and
the finding that individuals with social and cognitive impairments were rated higher in
social vulnerability (Pinsker et al., 2006; Pinsker et al., 2011; Sofronoff et al. 2011), we
examined age-related differences in social vulnerability in typically developing
children, and explored the level of social vulnerability amongst children with clinical
needs. Based on this past research it was expected that parents would rate younger
children as more socially vulnerable than older children, and that social vulnerability
would be elevated in clinical groups (in particular, those associated with social
difficulties).

Method

Participants

Nine-hundred and two parents/guardians of elementary school-aged children
(Kindergarten – Year 6) from across Australia were recruited via a broad approach,
which included advertisements placed in newsletters of schools or education
associations in each state. In addition to this, the study was advertised via the media
(television, radio and social), as well as through email distribution lists.

Of the 902 parents, 112 reported that their child had a physical, mental or
chronic illness or disability and were removed from the psychometric analysis of the
scale (these children formed the clinical groups in the case study analysis). This left data
from 790 parents/guardians (93% mothers) for analysis. The sample consisted of
parents of 417 girls (52.8%) and 373 boys, ranging in age from 3 years 8 months to 12
years 4 months. Additional demographic characteristics of the sample are presented in
Table 2.1.
Table 2.1

*Demographic characteristics of the sample.*

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Sample (n = 790)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of children (M, SD)</td>
<td>2.25 (0.85)</td>
</tr>
<tr>
<td>Marital Status</td>
<td></td>
</tr>
<tr>
<td>Married, de facto</td>
<td>687 (87.0%)</td>
</tr>
<tr>
<td>Divorced, separated</td>
<td>67 (8.5%)</td>
</tr>
<tr>
<td>Single</td>
<td>26 (3.3%)</td>
</tr>
<tr>
<td>Widowed</td>
<td>1 (0.1%)</td>
</tr>
<tr>
<td>Missing</td>
<td>9 (1.1%)</td>
</tr>
<tr>
<td>Ethnicity</td>
<td></td>
</tr>
<tr>
<td>Australian</td>
<td>568 (71.9%)</td>
</tr>
<tr>
<td>Aboriginal/Torres Strait Islander</td>
<td>5 (0.6%)</td>
</tr>
<tr>
<td>European</td>
<td>91 (11.5%)</td>
</tr>
<tr>
<td>New Zealander</td>
<td>32 (4.0%)</td>
</tr>
<tr>
<td>Other</td>
<td>86 (10.9%)</td>
</tr>
<tr>
<td>Missing</td>
<td>8 (1.0%)</td>
</tr>
<tr>
<td>Family average annual income</td>
<td></td>
</tr>
<tr>
<td>$0 - $60,000</td>
<td>136 (17.2%)</td>
</tr>
<tr>
<td>$60,000 - $100,000</td>
<td>217 (27.5%)</td>
</tr>
<tr>
<td>$100,000 - $150,000</td>
<td>214 (27.2%)</td>
</tr>
<tr>
<td>$150,000 - $200,000</td>
<td>111 (14.0%)</td>
</tr>
<tr>
<td>$200,000 +</td>
<td>77 (9.7%)</td>
</tr>
<tr>
<td>Missing</td>
<td>34 (4.3%)</td>
</tr>
<tr>
<td>Type of School</td>
<td></td>
</tr>
<tr>
<td>Government</td>
<td>627 (79.4%)</td>
</tr>
<tr>
<td>Private/Independent</td>
<td>63 (8.0%)</td>
</tr>
<tr>
<td>Catholic</td>
<td>84 (10.6%)</td>
</tr>
<tr>
<td>Montessori/Steiner/Waldorf</td>
<td>5 (0.6%)</td>
</tr>
<tr>
<td>Home</td>
<td>5 (0.5%)</td>
</tr>
<tr>
<td>Missing</td>
<td>7 (0.9%)</td>
</tr>
</tbody>
</table>
An additional sample of parents (84.4% mothers) and teachers of a local sample of children \( n = 96 \) also participated in the study to provide further evidence for the reliability and validity of the scale. Participants were recruited through elementary schools of varying socioeconomic status across the metropolitan area of a major city. The sample consisted of 45 boys (46.9%), ranging in age from 6 years 1 month to 11 years 8 months.

**Measures and Procedure**

This study was approved by our University’s ethics committee. A web-based software program (Qualtrics) was used to conduct the survey online over a period of 12 months. The study was introduced as an investigation into children’s ability to detect or avoid potentially harmful social interactions. Upon entering the survey website, a participant information sheet was presented along with links to follow depending on whether parents consented or declined to participate. Parents who consented to participate completed three questionnaires (described below).

**Children’s Social Vulnerability Questionnaire (CSVQ).** The CSVQ is a parent-report measure that was developed as part of the current study to measure social vulnerability. It is predominantly based on the SVRI-CV (Bianco, 2012), as well as the SVS (Sofronoff, Dark, & Stone, 2011). Before launching the national survey, we sought to pilot test the scale on a small sample of parents \( n = 10 \). Qualitative feedback revealed that there was repetition within the scale and that some of the items were not applicable to young children (e.g., “lent money or things to someone who is unlikely to repay them or give them back”). Based on this feedback from parents, such items were removed from the scale. Consequently, the preliminary scale used for the development of the CSVQ consisted of 11 items. Of these items, 6 were hypothesised to map on to the credulity factor and 5 on to the gullibility factor. Parents were asked to rate the extent to which they agreed with the statements about their child’s behaviour over the
past 6 months on a 5-point Likert scale (0 = never or very rarely, 4 = very often or always). The preliminary scale is provided in Appendix 2.A.

**Strengths and Difficulties Questionnaire (SDQ; Goodman, 1997).** The SDQ is a widely-used 25-item informant-rated measure of behavioural and emotional problems for children aged 3- to 16-years of age (Goodman, 1997). Informants are asked to rate the presence of each behaviour over the past 6 months on a 3-point scale (0 = not true, 1 = somewhat true, 2 = certainly true). In the current study, scores on the internalising problems (emotional symptoms and peer relationship problems), externalising problems (conduct problems and hyperactivity/inattention), and prosocial behaviour subscales were used to examine the validity of the CSVQ (Goodman, Lamping, & Ploubidis, 2010). For this study, the internal consistency was adequate for the internalising problems (α = .69), externalising problems (α = .70) and prosocial behaviour (α = .74) scales.

**Demographics.** Parents were asked to provide background information regarding the participating child, including child’s age, gender, year level, and relationship to the rater, as well as their own marital status, education level, socioeconomic status, family composition, and ethnicity. Parents were also asked for information regarding the diagnoses of medical illnesses or developmental difficulties.

**Statistical Analysis**

CSVQ data were screened for missing values. Little’s missing completely at random (MCAR) test demonstrated that data were missing completely at random, $\chi^2(108) = 93.24, p = .843$. The proportion of missing values was 0.25%; therefore, expectation maximisation in SPSS was used to replace missing values before conducting the factor analysis.

The data were analysed in three stages. Stage 1 involved an exploratory and confirmatory factor analysis to examine the underlying factor solution of the CSVQ. To
do this, the sample was randomly split in half within each year level, leaving 389 participants in the first sample (EFA) and 401 participants in the second sample (CFA). Stage 2 involved a series of analyses to examine the psychometric properties of the scale, relationship with psychosocial functioning, and year level differences in social vulnerability. Given that children’s social experiences largely occur at school with peers in their year level, and because it was anticipated that exposure to social experiences and peer interactions at school would be one of the critical factors influencing changes in social vulnerability (due to the influence of peers on social development; Brechwald & Prinstein, 2011), comparisons of social vulnerability scores were based on year level at school, rather than chronological age. For these analyses, the whole sample was examined. Finally, in Stage 3, mean ratings of social vulnerability in the typically developing sample were compared to ratings of social vulnerability in the sample of children who were identified to have a physical, mental or chronic illness or disability.

**Results**

**Stage 1: Examining the Factor Structure of the CSVQ**

**Exploratory factor analysis.** An exploratory factor analysis using a maximum likelihood extraction and a direct oblimin rotation was conducted on the CSVQ. The Kaiser-Meyer-Olkin measure of sampling adequacy was .93, and Bartlett’s test of sphericity was significant, $\chi^2 (55) = 1827.78, p < .001$. Examination of the eigenvalues revealed a one-factor solution. The first factor had an eigenvalue of 5.39 and accounted for 48.9% of the variance in the CSVQ. The second factor had an eigenvalue .92, hence supporting a one-factor solution. Similarly, inspection of the scree plot provided further support for a one-factor solution. Items with factor loadings above .55 were deemed to be good items (Comrey & Lee, 1992) and were retained. Consequently, one item (“is friends with kids who have been mean”) was removed from the scale.
A second exploratory factor analysis of the remaining 10-items again supported a one-factor solution (the first factor had an eigenvalue of 5.19, the second factor had an eigenvalue of .84) that accounted for 51.9% of the variance in the CSVQ, with all factor loadings greater than 0.55. However, examination of the reproduced residuals revealed two values above .10, suggesting the presence of another factor (Tabachnick & Fidell, 2001). Consequently, another exploratory factor analysis forcing a two-factor solution was conducted. All items, apart from one (“can be tricked into doing things that others laugh at”) loaded onto a single factor. Thus, the two-factor solution was deemed to be invalid, and the 10-item single factor solution was endorsed. Table 2.2 presents factor loadings for the retained scale items for the 10-item one-factor solution.

Table 2.2

Factor loadings of the items selected for the final scale.

<table>
<thead>
<tr>
<th>Item</th>
<th>Factor 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Believes everything kids tell him/her</td>
<td>.60</td>
</tr>
<tr>
<td>2. Is easily talked into handing over toys, valued items or money</td>
<td>.55</td>
</tr>
<tr>
<td>3. Can be persuaded into doing things that he/she doesn’t want to do or things that will get them into trouble</td>
<td>.61</td>
</tr>
<tr>
<td>4. Falls for a trick, even when previously tricked by the same person</td>
<td>.73</td>
</tr>
<tr>
<td>5. Believes things that are clearly unbelievable</td>
<td>.68</td>
</tr>
<tr>
<td>6. Is unaware when other kids are being mean to him/her</td>
<td>.57</td>
</tr>
<tr>
<td>7. Can be tricked into doing things that others laugh at</td>
<td>.67</td>
</tr>
<tr>
<td>8. Does things that can be described as “gullible”</td>
<td>.77</td>
</tr>
<tr>
<td>9. Believes someone even though they have lied to them in the past</td>
<td>.73</td>
</tr>
<tr>
<td>10. Is easily fooled</td>
<td>.86</td>
</tr>
</tbody>
</table>
**Confirmatory factor analysis.** A confirmatory factor analysis using IBM SPSS AMOS version 21.0 was conducted to examine the fit of the 10-item one-factor structure solution identified in the exploratory factor analysis. Due to moderate levels of item skewness and the sensitivity of structural equation modelling to deviations from normality, square root transformations were conducted on each item (Kline, 2005). The 10-item model was estimated using maximum likelihood estimation. The fit of the model was assessed through examination of the chi-square statistic, particularly the adjusted $\chi^2 (\chi^2/df)^1$. In addition, incremental model fit indices, including the Comparative Fit Index [CFI], Tucker-Lewis Index [TLI], Adjusted Goodness of Fit Index [AGFI], root mean square error of approximation [RMSEA], and standardised root mean squared residual [SRMR], were examined as the robustness of these particular indices has been demonstrated (Hu & Bentler, 1999).

Examination of the fit statistics for the 10-item solution highlighted that the chi-square statistic was significant, $\chi^2 (35) = 90.37, p < .001$, however the adjusted $\chi^2$ value was adequate (2.58). Further examination of the incremental fit statistics demonstrated that some did not meet recommended cut-off criteria (see Table 2.3), suggesting that the model did not provide a good fit to the data. Inspection of the standardised residual covariances between the items revealed high correlations between items 1 and 3, and 3 and 4 (see Appendix 2.A). Furthermore, inspection of the squared multiple correlations demonstrated that of these items, the construct explained the least variance in items 1 and 3 (.29 and .30, respectively). Therefore, items 1 and 3 were removed from the scale, and a subsequent confirmatory factor analysis was used to examine the fit of an 8-item model. For this model, the chi-square statistic was significant, $\chi^2 (20) = 41.62, p = .003$, however the adjusted $\chi^2$ was adequate (2.08). All incremental fit statistics met or

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1 The chi-square statistic is known to be overly sensitive in moderate to large sample sizes, so it has been argued that the model demonstrates reasonable fit if $\chi^2/df \leq 3$ (Kline, 2005)
exceeded recommended cut-off criteria (see Table 2.3), suggesting that the 8-item model provided a good fit to the data.

Table 2.3

*Confirmatory factor analysis fit indexes.*

<table>
<thead>
<tr>
<th>Fit Index</th>
<th>10-Item Model</th>
<th>8-Item Model</th>
</tr>
</thead>
<tbody>
<tr>
<td>CFI&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.96</td>
<td>.98</td>
</tr>
<tr>
<td>TLI&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.95</td>
<td>.97</td>
</tr>
<tr>
<td>AGFI&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.93</td>
<td>.95</td>
</tr>
<tr>
<td>RMSEA&lt;sup&gt;b&lt;/sup&gt; [lower and upper confidence intervals]</td>
<td>.06 [.05, .08]</td>
<td>.05 [.03, .07]</td>
</tr>
<tr>
<td>SRMR&lt;sup&gt;b&lt;/sup&gt;</td>
<td>.04</td>
<td>.03</td>
</tr>
</tbody>
</table>

<sup>a</sup> Ideal value, ≥ 0.95 (Hu & Bentler, 1999)

<sup>b</sup> Ideal value, ≤ 0.06 (Hu & Bentler, 1999)

All items were found to load onto the social vulnerability factor, and all standardised loadings were above .45. Thus, the confirmatory factor analysis provided support for a one-factor, 8-item solution of the CSVQ, and demonstrated that the overall goodness-of-fit of the model was sound. Parameter estimates are presented in *Figure 2.1*. 
Figure 2.1. Parameter estimates for the CSVQ one-factor model. The numbers next to the single-headed arrows leading from the latent variable to the observed variables are the standardised factor loadings. The values next to the small single-headed arrows leading to the observed variables reflect the residual variance for each item.
To cross validate the one-factor solution across gender and school year level, measurement invariance was assessed. To do this, factor loadings for measured variables were constrained to be invariant between groups, and a chi-square difference test between this model and an unconstrained model was performed. The chi-square difference test demonstrated that for both gender and year level the constrained model did not provide a significantly worse fit than the unconstrained model, $\Delta \chi^2 (8) = 9.68, p = .288$, $\Delta \chi^2 (56) = 67.14, p = .146$, respectively. Therefore, it can be concluded that the factor structure does not differ between genders or across year levels, providing support for the 8-item model across groups.

**Stage 2: Psychometric Properties and Year Level Differences in Social Vulnerability**

**Reliability.** The internal consistency of the CSVQ was good ($\alpha = .86$). Corrected item-total correlations for each item ranged from .48 to .75. The test re-test reliability of the CSVQ was assessed in a small subsample of participants ($n = 84$) who elected to complete the questionnaires again at a 1 month interval. The subsample consisted of parents (94% mothers) of 43 girls (51.2%) and 41 boys, ranging in age from 4 years 3 months to 12 years 0 months. There were no differences in age, child gender or parents relationship to the child between this subsample and the full sample. Test re-test reliability was strong ($r (73) = .74$), indicating that CSVQ scores remained relatively stable over this time period.

**Validity.** To assess the concurrent and discriminant validity of the scale, partial correlations between social vulnerability and subscale scores on the SDQ were
examined (controlling for year level). Social vulnerability was significantly positively correlated with internalising symptoms \((r (785) = .32, p < .001)\) and externalising symptoms \((r (785) = .33, p < .001)\), and was negatively correlated with prosocial behaviour \((r (785) = -.09, p = .008)\).

**Additional assessment of reliability and validity.** To assess the inter-rater reliability of the scale we asked both parents and class teachers of a local sample of children to complete the CSVQ and SDQ, and then correlated the reports. Ratings of social vulnerability between parents and teachers were significantly correlated \((r (93) = .29, p = .004)\).

Partial correlations between social vulnerability and subscale scores on the SDQ (controlling for year level) for parents and teachers were then examined to further assess the concurrent and discriminant validity of the scale (see Table 2.4). For both parent and teacher reports, there was a significant, positive correlation between social vulnerability and internalising symptoms and externalising symptoms. The correlation between social vulnerability and prosocial behaviour was negative (albeit, not significant for parents). The magnitude of the parent report correlations were similar to the magnitude of correlations that emerged in the larger national sample.
Table 2.4

*Partial correlations controlling for year between social vulnerability and internalising symptoms, externalising symptoms, and prosocial behaviour (df = 93).*

<table>
<thead>
<tr>
<th>Measure</th>
<th>1.</th>
<th>2.</th>
<th>3.</th>
<th>4.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. CSVQ</td>
<td>--</td>
<td>.31**</td>
<td>.58***</td>
<td>-.42***</td>
</tr>
<tr>
<td>2. SDQ – Internalising Symptoms</td>
<td>.31**</td>
<td>--</td>
<td>.38***</td>
<td>-.35**</td>
</tr>
<tr>
<td>3. SDQ – Externalising Symptoms</td>
<td>.24*</td>
<td>.07</td>
<td>--</td>
<td>-.60***</td>
</tr>
<tr>
<td>4. SDQ – Prosocial Behaviour</td>
<td>-.06</td>
<td>-.16</td>
<td>-.23*</td>
<td>--</td>
</tr>
</tbody>
</table>

Note: Teacher reports are presented above the diagonal and parent reports are presented below the diagonal.

* p < .05, ** p < .01, *** p < .001

**Year level differences in social vulnerability.** To examine differences in social vulnerability across year levels, mean scores for each year level and gender were compared. Mean social vulnerability scores and standard errors for each year level are presented in Figure 2.2.
Figure 2.2. Mean social vulnerability scores and standard errors for each year level, minimum = 0, maximum = 32. Note: Pre-Primary is the first year of full-time schooling in Australia.

A univariate analysis of variance with year level (Kindergarten, Pre-Primary, Year 1, Year 2, Year 3, Year 4, Year 5, Year 6) and gender (male, female) as between-subjects factors was conducted on total scores on the CSVQ. This analysis revealed a significant main effect of year level, $F(7, 772) = 9.27, p < .001, \eta^2_p = .08$, with children in lower year levels rated as being more socially vulnerable than children in higher year levels, and a significant main effect of gender, $F(1, 772) = 5.79, p = .016, \eta^2_p = .01$, with boys ($M = 9.91, SE = .29$) rated as being more socially vulnerable than girls ($M = 8.95, SE = .27$). The interaction between year level and gender was not significant, $F(7, 772) = .95, p = .470, \eta^2_p = .01$.

To further examine the impact of year level on social vulnerability, pairwise comparisons using a Bonferroni correction were conducted. Results demonstrated gradual reductions in parent perceptions of children’s social vulnerability with increasing year level, with significant differences in social vulnerability scores between
children in Year 4 and children in the first three year levels (i.e., Kindergarten, Pre-
Primary, and Year 1), children in Year 5 and children in the first three year levels (i.e.,
Kindergarten, Pre-Primary, and Year 1), and children in Year 6 and children in the first
five year levels (i.e., Kindergarten, Pre-Primary, Year 1, Year, 2 and Year 3) (all \( ps <
.05 \)). Means and standard deviations for the sample by year level and gender are
presented in Table 2.5

Table 2.5

*Means and standard deviations of social vulnerability across year level and gender.*

<table>
<thead>
<tr>
<th>Year Level</th>
<th>Age Range (years)</th>
<th>( n )</th>
<th>( M )</th>
<th>( SD )</th>
<th>( n )</th>
<th>( M )</th>
<th>( SD )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kindergarten</td>
<td>3.73 – 5.83</td>
<td>51</td>
<td>11.63</td>
<td>6.00</td>
<td>51</td>
<td>10.82</td>
<td>5.48</td>
</tr>
<tr>
<td>Pre-Primary</td>
<td>4.71 – 6.44</td>
<td>59</td>
<td>10.76</td>
<td>5.25</td>
<td>80</td>
<td>10.65</td>
<td>4.96</td>
</tr>
<tr>
<td>Year 1</td>
<td>5.44 – 7.53</td>
<td>55</td>
<td>12.54</td>
<td>6.12</td>
<td>53</td>
<td>10.22</td>
<td>5.59</td>
</tr>
<tr>
<td>Year 2</td>
<td>6.64 – 8.44</td>
<td>51</td>
<td>10.77</td>
<td>5.95</td>
<td>53</td>
<td>9.38</td>
<td>5.38</td>
</tr>
<tr>
<td>Year 3</td>
<td>7.68 – 9.75</td>
<td>40</td>
<td>10.55</td>
<td>5.68</td>
<td>43</td>
<td>8.56</td>
<td>5.31</td>
</tr>
<tr>
<td>Year 4</td>
<td>8.77 – 10.95</td>
<td>48</td>
<td>9.27</td>
<td>6.11</td>
<td>52</td>
<td>7.36</td>
<td>4.50</td>
</tr>
<tr>
<td>Year 5</td>
<td>9.15 – 11.34</td>
<td>40</td>
<td>7.67</td>
<td>5.15</td>
<td>41</td>
<td>7.98</td>
<td>4.92</td>
</tr>
<tr>
<td>Year 6</td>
<td>10.15 – 12.27</td>
<td>28</td>
<td>6.07</td>
<td>4.96</td>
<td>43</td>
<td>6.65</td>
<td>5.54</td>
</tr>
</tbody>
</table>

**Stage 3: Social Vulnerability in Clinical Populations**

To explore the potential clinical utility of the scale, a case study analysis was
performed on scores for children whose parents indicated that they had a physical,
mental or chronic illness or disability. To do this, CSVQ scores for each child were
compared with the corresponding normative data for the child’s year level and gender,
and a \( z \)-score was calculated for each child. Clinical groups that had a small number of
cases ($n < 10$) were combined into an ‘other’ category. This included children indicated to have an intellectual disability (ID), motor dyspraxia and sensory processing difficulties. If children were indicated to have more than one diagnosis, they were included in all applicable groups.

For each clinical group, the proportion of children with a CSVQ rating at least 1.5 standard deviations above the typically developing year level and gender mean is presented in Table 2.6, alongside descriptive information. Social vulnerability scores were elevated across all clinical groups, but were particularly elevated in children with an autism spectrum disorder (ASD), attention-deficit/hyperactivity disorder (ADHD), and children classified in the ‘other’ category, with mean z-scores for each of these groups greater than 1, and at least 40% of children in each group with a total social vulnerability rating greater than 1.5 times their year level and gender mean. However, sample sizes are small so these results should be interpreted with caution.

---

1 This criterion was chosen because 1.5 standard deviations above the mean is clinically accepted to represent deviation from the mean (Strauss, Sherman, & Spreen, 2006).
Table 2.6
Mean, standard deviation and range of standardised scores, and proportion of children with a standardised score above 1.5 for each clinical group.

<table>
<thead>
<tr>
<th>Group</th>
<th>n</th>
<th>M</th>
<th>SD</th>
<th>Range</th>
<th>Proportion &gt; 1.5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Autism spectrum disorder</td>
<td>19</td>
<td>1.72</td>
<td>1.53</td>
<td>-1.23 – 4.21</td>
<td>52.6%</td>
</tr>
<tr>
<td>Attention-deficit/hyperactivity disorder</td>
<td>28</td>
<td>1.11</td>
<td>1.60</td>
<td>-1.30 – 4.02</td>
<td>42.9%</td>
</tr>
<tr>
<td>Specific learning disability&lt;sup&gt;a&lt;/sup&gt;</td>
<td>17</td>
<td>1.77</td>
<td>1.02</td>
<td>-1.07 – 3.23</td>
<td>29.2%</td>
</tr>
<tr>
<td>Specific language impairment</td>
<td>17</td>
<td>.41</td>
<td>1.13</td>
<td>-1.67 – 2.82</td>
<td>11.1%</td>
</tr>
<tr>
<td>Chronic illness&lt;sup&gt;b&lt;/sup&gt;</td>
<td>14</td>
<td>.33</td>
<td>1.48</td>
<td>-1.95 – 2.59</td>
<td>28.6%</td>
</tr>
<tr>
<td>Emotional and/or behavioural problem</td>
<td>19</td>
<td>.92</td>
<td>1.33</td>
<td>-.86 – 3.60</td>
<td>36.8%</td>
</tr>
<tr>
<td>Other&lt;sup&gt;c&lt;/sup&gt;</td>
<td>17</td>
<td>1.41</td>
<td>1.55</td>
<td>-1.64 – 4.02</td>
<td>57.1%</td>
</tr>
</tbody>
</table>

<sup>a</sup> Includes reading disorder, disorder of written expression and/or mathematics disorder;

<sup>b</sup> As defined by the Australian Institute of Health and Welfare (2005);

<sup>c</sup> Includes intellectual disability, motor dyspraxia and sensory processing difficulties.

Discussion

The aim of this research was to create a reliable and valid parent-report measure of social vulnerability for use with children, and to examine whether social vulnerability is an important construct in typically developing children. The CSVQ demonstrated strong psychometric properties, including very good internal consistency, good test retest reliability and sound inter-rater agreement. Having developed a psychometrically solid instrument of social vulnerability, we then examined the relationship between social vulnerability and psychosocial functioning in typically developing children, investigated age-related differences in social vulnerability in typically developing...
children, and explored the level of social vulnerability associated with a number of clinical groups. Together, the results demonstrated that social vulnerability is a psychosocial construct that has the potential to inform on children who are at risk of experiencing social, emotional and behavioural difficulties.

One key finding from the current study was the relationship between social vulnerability and psychosocial difficulties in children. In two samples, parents’ reports of social vulnerability were associated with both internalising and externalising problems; that is, children who were rated as being socially vulnerable were likely to display higher levels of emotional and behavioural difficulties. This is consistent with results in children with Asperger’s syndrome (Sofronoff et al., 2011), and provides support for the validity and utility of the CSVQ. Furthermore, the weak (parent) and moderate (teacher) negative relationship between social vulnerability and prosocial behaviour indicates that being socially vulnerable is not simply having a lack of social skills. This is consistent with Greenspan et al. (2001) who suggested that poor social skills are likely to contribute to, but are not the same thing as, being deceived or cheated. Further exploration of these relationships, this time with teachers as the raters, again demonstrated a positive relationship between social vulnerability and both internalising symptoms and externalising behaviours, and a negative relationship between social vulnerability and prosocial behaviours. This mirrored the pattern of correlations evident from parents’ ratings, and provides additional support for the relationship between social vulnerability and psychosocial adjustment in children. However, the strength of associations between parent- and teacher-reports differed. This issue has been acknowledged within the literature. It has been suggested that contextual factors may influence children’s behaviours and, therefore, raters in differing environments (such as parents and teacher) may be privy to different behaviours (Achenbach, Edelbrock, & Howell, 1987). This explanation was further expanded by
Takeda, Nissley-Tsiopinis, Nanda, & Eiraldi (2016) who purported that both situational specificity and the informant’s unique perspectives of children’s behaviour (i.e., differing perspectives on what constitutes acceptable and unacceptable behaviours) underlie informant discrepancy. That aside, the moderate level of agreement on CSVQ scores between parents and teachers in this sample is consistent with levels of inter-rater agreement reported between parents and teachers on other measures of child psychopathology (Achenbach et al., 1987), providing support for the inter-rater reliability of the CSVQ. Taken together, these findings suggest that the CSVQ is a reliable and valid measure of social vulnerability in children. Moreover, they indicate that social vulnerability is a discrete construct that is not simply indicative of general psychosocial difficulties, but is potentially important for understanding emotional and behavioural difficulties in children.

Another important finding was that parents perceived children in younger years as more socially vulnerable than children in older years. The overall pattern suggests a progressive decline in social vulnerability throughout elementary school, consistent with the hypothesis of Greenspan et al. (2001) that social vulnerability decreases with age. It is possible that increased social exposure throughout school and the influence of peers on social interactions (Brechwald & Prinstein, 2011) may explain this pattern, reflecting the shift that children experience from being in a highly supervised environment in the younger years of elementary school, to being given increasing amounts of freedom as they progress through school. Consequently, children learn to independently navigate social interactions and learn through exposure to situations in which social vulnerability may result in negative outcomes.

An alternative explanation for this finding is a developmental trend, whereby children outgrow the tendency to being tricked or fooled by others due to advances in cognitive functioning. This reflects developmental literature suggesting that as children
develop, their ability to critically evaluate information (termed “critical stance”) improves (see Mills, 2013). From this perspective, trust (believing information from others) is important because from an early age we rely on those around us to learn, develop an understanding of the social world, and develop social relationships (Betts & Rotenberg, 2008; Mills, 2013). Mills (2013) identified that before the age of 4, children demonstrate a limited ability to critically evaluate information, but that as they become older this ability improves (Mills, 2013). Mills (2013) attributed this to a number of factors, including improvements in cognition. Therefore, it is possible that the developmental pattern in social vulnerability reflects a combination of an improved ability to critically evaluate information, and increased exposure to social situations. Regardless of year level, boys were rated as being slightly more socially vulnerable than girls. This pattern may reflect small gender differences, favouring girls, in children’s social understanding and theory of mind (Charman, Ruffman, & Clements, 2002; Tahiroglu et al., 2014), as theory of mind is thought to underlie social vulnerability (Sofronoff et al., 2011). However, further research is required to determine whether this is the case.

Finally, we identified that social vulnerability may be an issue for many clinical groups; most notably, children with ADHD and ASD (the latter of which has previously been documented; Sofronoff et al., 2011). For example, over 40% of the children with ADHD in our sample were considered to be more socially vulnerable than what we would expect to occur due to normal variation, suggesting that these children are at an increased risk compared to their peers. There is a plethora of research on the negative social interactions experienced by children with ADHD and ASD, but there has been a dearth of research considering the potential for social vulnerability to explain at least some of this phenomenon. The results from this study suggest that perhaps some of the social problems, in particular bullying, that have been documented for these populations
may be better understood by assessing social vulnerability. Moreover, this might also extend to children with other clinical and/or developmental disorders. However, these results should be interpreted with caution as this was not intended to be a clinical study. Rather, by looking at the small samples provided within the broader national sample, the results indicate the potential clinical application of social vulnerability to understanding the social risk associated with a range of developmental and clinical disorders. Further research is required to determine whether social vulnerability can help explain social difficulties evident within these populations.

The current results also have theoretical implications, namely, that social vulnerability in elementary school children is best represented by a single factor. The exploratory factor analysis favoured a 10-item single factor solution, which was supported by strong factor loadings and strong corrected item-total correlations. In the confirmatory factor analysis, further support for a one-factor solution was obtained, with an 8-item solution preferred. Therefore, the two-factor conceptualisation of social vulnerability (i.e., credulity and gullibility) proposed by Greenspan et al. (2001) did not emerge in the current study, even when a two-factor solution was forced, despite having items clearly representing both credulity and gullibility, and a large sample with considerable variability. Rather, our results indicate that credulity and gullibility are part of the same factor, suggesting that the theoretical conceptualisation of social vulnerability described by Greenspan et al. (2001) is not applicable to children. It is possible that, for children, social vulnerability is a unitary construct, and that as individuals develop, the construct becomes more complex and delineates into two factors (credulity and gullibility) as seen in older adults (Pinsker et al., 2011). Further research conducted across the lifespan will be required to determine if this is in fact the case.
Limitations

There are some limitations to the current study. Foremost, we had a low proportion of fathers in the study, and as such, the views expressed largely represent those of mothers. However, given that mothers are more commonly the primary caregiver (Australian Bureau of Statistics, 2006), we do not see this to be a major limitation. Additionally, although the study provides support for a relationship between social vulnerability and psychosocial functioning using both parent and teacher reports, future research would benefit from assessing a broader range of measures of psychosocial functioning to enable us to gain a more comprehensive understanding of the relationship between social vulnerability and specific aspects of children’s psychosocial functioning.

Conclusion

Being vulnerable to deception has been hypothesised to play an important role in children’s daily social interchanges. Despite this, current research investigating social vulnerability in typically developing children is limited. Results of this study support the use of the CSVQ as a brief and psychometrically sound instrument for measuring parental perceptions of social vulnerability in typically developing elementary school-aged children. Importantly, the results indicate that social vulnerability is a psychosocial construct that is distinct from other aspects of children’s emotional and behavioural adjustment, as well as aspects of their social interactions (e.g., social skills). Furthermore, the results highlight the potential for social vulnerability to provide us with greater insight into the social exchanges of clinical groups of children who are known to experience social problems.

The current study contributes to a developing body of knowledge about social vulnerability during childhood. It provides access to comprehensive and reliable normative data which will enable professionals working within psychology and
education to assess a parent’s perception of their child’s level of social vulnerability, and identify at-risk children. In doing so, strategies could be implemented to protect these children from negative or potentially harmful social interactions.
References


**Appendix 2.A. The preliminary Children’s Social Vulnerability Questionnaire (CSVQ)**

This questionnaire contains a list of phrases that can be used to describe your child’s behaviour in social situations. Please read each item and then give your answers on the basis of your child’s behaviour **over the last 6 months**. Please try to answer all of the questions as best you can, even if you are unsure.

Your child’s name: ___________________________ Date: ___________

My child…

<table>
<thead>
<tr>
<th></th>
<th>Never or Very Rarely</th>
<th>Sometimes</th>
<th>Very Often or Always</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Believes everything kids tell him/her.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>Is friends with, or plays with, kids who have been mean to him/her in the past.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>Is easily talked into handing over toys, valued items or money</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>Can be persuaded into doing things that he/she doesn’t want to do or things that will get them into trouble.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>Falls for a trick, even when previously tricked by the same person.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>Believes things that are clearly unbelievable.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td>Is unaware when other kids are being mean to him/her.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td>Can be tricked into doing things that others laugh at.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9.</td>
<td>Does things that can be described as “gullible”.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10.</td>
<td>Believes someone even though they have lied to them in the past.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11.</td>
<td>Is easily fooled.</td>
<td></td>
<td></td>
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</tbody>
</table>
Chapter 3  Cognitive mechanisms underlying social vulnerability in children: Importance of theory of mind

Abstract

Social vulnerability refers to an impaired ability to detect or avoid potentially harmful interpersonal interactions, such as being easily fooled or tricked. In children, social vulnerability has been associated with internalising behaviours, externalising behaviours and peer victimisation. Despite this, it is not yet understood what factors might place a child at an increased risk of social vulnerability. The aim of the current study was to identify specific cognitive mechanisms that underlie social vulnerability in children; of particular interest were theory of mind, language ability and executive functioning.

Participants were children aged 6- to 9-years old (n = 118) and their parents. A path analysis identified that theory of mind fully mediated the relationship of executive functioning and language ability to social vulnerability, demonstrating that higher levels of executive functioning and language ability are associated with higher levels of theory of mind, which in turn are associated with lower levels of social vulnerability. These results suggest that theory of mind plays an important role in vulnerable social interactions, and demonstrate further support for the importance of theory of mind skills to social interactions during childhood.

KEYWORDS: Social vulnerability, theory of mind, language, executive functioning, children.
Cognitive mechanisms underlying social vulnerability in children: Importance of theory of mind

Social vulnerability refers to an impaired ability to detect or avoid potentially harmful interpersonal interactions (Pinsker, Stone, Pachana, & Greenspan, 2006), such as being easily fooled or tricked by others. Heightened levels of social vulnerability can diminish a person’s capacity to interact in social situations and increase the risk of negative interpersonal experiences (Pinsker, 2011; Seward, Bayliss, & Ohan, 2016a; Sofronoff, Dark, & Stone, 2011). In children, social vulnerability has been associated with a range of negative psychosocial consequences, including internalising problems, externalising behaviours and being bullied (Seward, Bayliss, et al., 2016a; Sofronoff et al., 2011). Given that social vulnerability plays an important role in understanding psychological and social problems in childhood that are known to persist into adolescence and beyond, it is important to understand what factors might place a child at an increased risk of being more susceptible to social manipulation than their peers. However, currently there is a paucity of research exploring the factors that contribute to social vulnerability.

Research with samples of children who have high levels of social vulnerability provides us with some insight into what cognitive mechanisms may be associated with increased levels of social vulnerability. In particular, children with developmental disorders (namely, children with an intellectual disability, autism spectrum disorder and attention-deficit/hyperactivity disorder) are rated as more socially vulnerable than their typically developing peers (Seward, Bayliss, et al., 2016a; Sofronoff et al., 2011). For children with an intellectual disability, it is reasonable to suggest that their impaired cognitive ability, which has been hypothesised to limit the ability to evaluate false claims (Greenspan, Loughlin, & Black, 2001), may play a role in social vulnerability. However, this cognitive mechanism cannot explain increased social vulnerability
evident in children with attention-deficit/hyperactivity disorder and Asperger’s syndrome (Seward, Bayliss, et al., 2016a; Sofronoff et al., 2011), as these children demonstrate increased social vulnerability despite average levels of intelligence (Holdnack, Goldstein, & Drozdick, 2011; McConaughy, Ivanova, Antshel, & Eiraldi, 2009). This suggests that cognitive mechanisms other than decreased cognitive ability account for elevated levels of social vulnerability. With this in mind, the aim of the current study was to identify specific cognitive mechanisms that underlie social vulnerability in children. Of particular interest were theory of mind, language ability and executive functioning; these were chosen due to their well-documented associations with psychosocial functioning in children (see discussion below), and, to some extent, their relationships with social vulnerability in other samples (Pinsker & McFarland, 2010; Pinsker, McFarland, & Pachana, 2010; Sofronoff et al., 2011). Each of these mechanisms and their possible association with social vulnerability in typically developing children are discussed below.

**Theory of Mind**

Theory of mind refers to the ability to understand mental states of the self and others, and to understand that others’ mental states can differ from one’s own (Wellman & Liu, 2004). Within developmental psychology, theory of mind has long been postulated to be related to social interactions (Hughes & Leekam, 2004). Empirical research supports this, with children whose theory of mind is more advanced also tending to display more advanced social behaviours (Slaughter, Imuta, Peterson, & Henry, 2015). For example, theory of mind has been demonstrated to be associated with social functioning in children, including prosocial behaviour (Caputi, Lecce, Pagnin, & Banerjee, 2012; Imuta, Henry, Slaughter, Seluk, & Ruffman, 2016; Watson, Nixon, Wilson, & Capage, 1999), peer acceptance (Banerjee, Watling, & Caputi, 2011; Slaughter, Dennis, & Pritchard, 2002; Slaughter et al., 2015), reciprocated friendships
(Fink, Begeer, Peterson, Slaughter, & Rosnay, 2015), and peer victimisation and aggression (Shakoor et al., 2012).

With regard to social vulnerability, Greenspan et al. (2001) originally hypothesised that elevated levels of social vulnerability evident in individuals with developmental disabilities may be attributable to social intelligence limitations. Since then, Sofronoff et al. (2011) and Pinsker et al. (2010) have echoed this hypothesis. Sofronoff et al. (2011) suggested that the ability to use the understanding that the thoughts and actions of others may be different to one’s own may be important to avoid being the subject of manipulation and deception. Specifically, they suggested that deficits in theory of mind may diminish a child’s ability to detect social cues that indicate deceit, placing him/her at risk of being exploited. Pinsker and McFarland (2010) provided some support for this association in a sample of older adults, demonstrating that social cognition (i.e., social intelligence, social skills) predicted social vulnerability after accounting for age. Moreover, Mills and Elashi (2014) provide converging support for such an association in typically developing children, demonstrating that better performance on an interpretive theory of mind task was associated with an increased ability to detect deception. However, the extent to which this relationship extends to social vulnerability in typically developing children requires further investigation.

**Executive Functioning**

Executive functioning is an umbrella term for a broad range of abilities that are involved in higher-order cognitive processes and enable intentional, goal-directed behaviour (Lehto, Juujärvi, Kooistra, & Pulkkinen, 2003). While specific definitions vary, there is a general consensus that executive functions comprise of three related, yet separable constructs; updating, inhibition and cognitive flexibility (Miyake et al., 2000). A robust amount of evidence links executive dysfunction to an array of poor
psychosocial outcomes during childhood. For example, executive dysfunction has been associated with internalising problems (Ghassabian et al., 2014; Hughes & Ensor, 2011), externalising problems (Hughes & Ensor, 2008, 2011; Schoemaker, Mulder, Deković, & Matthys, 2013), fewer prosocial behaviours (Diamantopoulou, Rydell, Thorell, & Bohlin, 2007), and peer victimisation and bullying behaviour (Verlinden et al., 2014) in children.

In regard to understanding social vulnerability, the elevated levels of social vulnerability evident in children with ADHD suggest that executive functioning may be a potentially important cognitive mechanism. In children with ADHD, executive deficits have been well documented (Barkley, 1997), as have social difficulties (e.g., Bagwell, Molina, Pelham, & Hoza, 2001; Hoza, 2007; Hoza et al., 2005), with researchers suggesting that it is the underlying nature of the ADHD symptoms themselves that result in the social problems evident in this population (Ohan & Johnston, 2007). Consequently, it is possible that executive deficits may account for heightened levels of social vulnerability that are evident in this population. Pinsker and McFarland (2010) provide support for an association between executive functioning and social vulnerability, demonstrating a relationship between social vulnerability and verbal fluency and abstract reasoning. However, research on the relationship between executive functioning and social vulnerability is sparse, and the extent to which such a relationship applies to typically developing children is yet to be examined.

Alternatively, executive functioning may be indirectly associated with social vulnerability via its relationship with theory of mind. Theory of mind requires a constant ability to hold multiple perspectives in mind (i.e., working memory), to switch between perspectives (i.e., switching) and to suppress irrelevant perspectives (i.e., inhibition) in given social situations (Carlson, Moses, & Claxton, 2004; Uekermann et al., 2010). Many studies have demonstrated a robust association between performance
on executive functioning and theory of mind tasks, demonstrating that executive functioning is related to both the emergence of theory of mind in early childhood (Carlson, Moses, & Breton, 2002; Carlson et al., 2004; Hughes & Ensor, 2007), and the development of complex aspects of social understanding across childhood (Bock, Gallaway, & Hund, 2015). Consequently, it is possible that any association evident between executive functioning and social vulnerability may be explained through theory of mind.

**Language Ability**

In addition to social intelligence and executive functioning, Pinsker and McFarland (2010) hypothesised that language may be a factor that is important to understanding social vulnerability. They suggested that someone with diminished verbal comprehension skills may be at an increased risk of being socially vulnerable due to a difficulty communicating with others and understanding social exchanges. Although no research has specifically addressed this, there is a vast array of literature linking language ability to social outcomes and theory of mind, which points to language as a mechanism that may underlie social vulnerability either directly or indirectly, via theory of mind. In typically developing children, poorer language skills have been associated with social difficulties, including peer rejection (Menting, Van Lier, & Koot, 2011), poorer social skills and lower social preference (Mostow, Izard, Fine, & Trentacosta, 2002). Moreover, children with language difficulties, particularly those with language comprehension difficulties, are at an increased risk for displaying behavioural, emotional and social difficulties at home and at school relative to typically developing children (Botting & Conti-Ramsden, 2008; Conti-Ramsden & Botting, 2004; Durkin & Conti-Ramsden, 2010; Lindsay, Dockrell, & Strand, 2007). Such difficulties become apparent during the preschool years (Gertner, Rice, & Hadley, 1994) and continue throughout the school years (Snowling, Bishop, Stothard, Chipchase, & Kaplan, 2006;
and can include social withdrawal (Hart, Fujiki, Brinton, & Hart, 2004), poorer quality of friendships (Botting & Conti-Ramsden, 2008; Durkin & Conti-Ramsden, 2007) and victimisation (Conti-Ramsden & Botting, 2004).

Finally, there is an abundance of research indicating a relationship between language ability and theory of mind, including advanced social understanding skills (e.g., Astington & Jenkins, 1999; Filippova & Astington, 2008; Milligan, Astington, & Dack, 2007; Peterson, Wellman, & Slaughter, 2012). Language has been suggested to play a causal role in the development of children’s social understanding, with a meta-analysis by Milligan et al. (2007) demonstrating that language task performance predicted later performance on false-belief tasks. Therefore, it is possible that any association between language and social vulnerability may be explained through theory of mind.

**The Current Study**

The aim of the current study was to investigate whether theory of mind, executive functioning and language ability predict individual differences in social vulnerability in typically developing children. Given the wealth of literature supporting associations between theory of mind, executive functioning, language ability, and social functioning in children, it was hypothesised that each of these mechanisms would be associated with, and predict individual differences in, social vulnerability. However, because executive functioning and language have been implicated as causal factors in the development of theory of mind skills, it was hypothesised that any relationship between executive functioning and language ability, and social vulnerability, may be mediated through theory of mind. In addition, fluid intelligence was measured to control for any individual differences in fluid intelligence that might contribute to variation in the cognitive, language and social vulnerability measures. To investigate this, children
completed a battery of tasks that assessed their cognitive functioning, and their parents completed a questionnaire measuring the extent to which their child displays socially vulnerable behaviours. Structural equation modelling was used to investigate the hypothesised relationships between theory of mind, executive functioning, language ability and social vulnerability in children.

**Method**

**Participants**

One hundred and eighteen children (grade 1 – grade 3) and their parents (89.0% mothers) participated in the study. Participants were recruited through elementary schools of varying socioeconomic status across the Perth metropolitan area. Children who were indicated to have a diagnosis of an emotional, behavioural, and/or learning disorder were removed from the sample \((n = 3)\). In addition, three children were excluded from analyses due to an inability to complete at least one of the tasks; consequently, the final sample consisted of 112 children. There were 51 girls (45.5%) and 61 boys, with children’s ages ranging from 6 years 1 month to 9 years 2 months \((M = 7.82, SD = .73)\). Parents self-identified their ethnicity as Australian (57.1%), British (18.8%), New Zealander (5.4%), Chinese (3.6%), and other (15.2%), and a wide range of family income levels (before tax) were reported, ranging from less than $60K per year to in excess of $200K per year (median = $100,000 - $150,000).

**Measures and Procedure**

Information sheets were distributed to parents of all children in grade 1 – grade 3. Those who returned a signed consent form were included in the study sample. Children then completed a battery of tasks that assessed specific aspects of their cognitive development (fluid intelligence, theory of mind, language comprehension and executive functioning). In addition, their parent completed a questionnaire measuring social vulnerability.
Social vulnerability. The Children’s Social Vulnerability Questionnaire (CSVQ; Seward, Bayliss, et al., 2016a) was used to measure social vulnerability. It is an 8-item parent-report measure of social vulnerability that asks parents to rate the degree with which they agreed with statements that are indicative of social vulnerability on a 5-point Likert scale (0 = never or very rarely, 4 = very often or always) over the past 6 months. The scale has demonstrated good internal consistency and test re-test reliability over a 1 month period (Seward, Bayliss, et al., 2016a). Internal consistency in the current study was also good (α = .84).

Fluid intelligence. The matrix reasoning subscale from the Wechsler Abbreviated Scale of Intelligence- Second Edition (WASI-II; Wechsler, 2011) was administered to provide a measure of fluid intelligence. The WASI-II is widely administered and has demonstrated good reliability and validity (Wechsler, 2011). The raw score (total number of items correct) was used as the measure of fluid intelligence.

Theory of mind. The Strange Stories Task (Happé, 1994) was used to measure advanced theory of mind. This task assesses the ability to provide context-appropriate mental state explanations to characters in social situations. In this task children were read 12 short vignettes by the administrator; each vignette presented a different type of social situation, including pretend, lie, joke, white lie, idiom, misunderstanding, double bluff, sarcasm, persuasion, contrary emotion, appearance/reality and forget. They were then asked two test questions; a comprehension question (“was it true, what X said?”) and a justification question (“why did X say that?”). Justifications were considered correct if children provided a context-appropriate mental state explanation and were coded using a 3-point scale indicating full, partial or failed understanding (2, 1 or 0 points, respectively). The internal consistency of the measure and interrater reliability of this coding scheme has been demonstrated in past research (Lecce, Zocchi, Pagnin, Palladino, & Taumoepeau, 2010).
**Language ability.** The Peabody Picture Vocabulary Test, Fourth Edition (PPVT-4; Dunn & Dunn, 2007) was used as a measure of language comprehension. The PPVT-4 has demonstrated good reliability and validity (Dunn & Dunn, 2007). The raw score (total number of items correct) was used as the measure of language comprehension.

**Executive tasks.** Three tasks were administered via paper and pencil that assessed children’s attentional flexibility, inhibition, and updating, respectively. To obtain an overall measure of executive functioning, a composite score was created by summing z-score transformations on each task (note that scores on the Stroop Task were reversed). Higher scores indicated better performance.

**Attentional flexibility.** A modified version of the Star Counting Task (SCT; Bayliss & Roodenrys, 2000; De Jong & Das-Smaal, 1990) was used as a measure of attentional flexibility (switching). The SCT requires the alternation of forward and backward counting. Each item on the test consists of a pattern of stars (nine rows of three to five stars each), with a number preceding the first star, and plus and minus signs interspersed between the others. The task is to count the stars left to right and row by row, starting with the number in front of the item and according to the direction that the sign denotes (forward or backward). Each item began with forward counting and the number of the last star was the answer for the item. The number of switches in the direction of counting increased from 2 to 5. Children completed 8 test items, which were preceded by an example and two practice items. The starting number of the items varied from 1 to 9. The number of patterns correctly completed was used as the measure of attentional flexibility.

**Inhibition.** The Stroop Task (Stroop, 1935) task was used as a measure of cognitive inhibition. Participants completed four conditions. In the first condition, participants were presented with 30 colour words (e.g., RED, BLUE or GREEN) in
black ink and they were required to read the words aloud. In the second condition, participants were presented with 30 strings of three to five coloured X’s (e.g., RED, BLUE or GREEN) and they were required to name the colour of the ink. Following this, participants were presented with 30 colour words (e.g., RED, BLUE or GREEN) in the corresponding ink colour and they were required to state the colour. Finally, participants were presented with 30 colour words (e.g., RED, BLUE or GREEN) in a different coloured ink (for example, the word RED presented in blue ink) and they were required to state the colour of the ink. Participants were instructed to complete each condition as quickly as possible. The difference in time to complete the second condition and fourth condition was used as the indicator of inhibition.

**Updating.** The categories task was adapted from St Clair-Thompson and Gathercole (2006) and was used as a measure of updating. In this task, participants were verbally presented with a number of items representing a target category (animals, objects, or colours) and were required to recall the last word presented in each of the target categories at the end of each trial. Each word was one syllable in length and was presented for 1000ms, with 2000ms before the presentation of the subsequent word.

Participants completed two blocks; 8 trials with two target categories (objects, animals), and 8 trials with three target categories (objects, animals, colours), each preceded by 3 practice trials. Within each block, participants were required to update the information in their memory 0, 1, 2 or 3 times, completing two trials for each number of updates. The order the trials were presented in were randomised within each block. To minimise the possibility that participants would monitor the number of words presented, rather than continuously update information, participants were not informed of the number of items (ranging from 2-6) in each trial. The total number of correctly recalled items across all trials (excluding practice trials) was used as the measure of updating.
Statistical Analysis

IBM SPSS AMOS version 21.0 using a maximum likelihood estimation was used to provide a confirmatory evaluation of the hypothesised structural model. As a preliminary step, bivariate and partial correlations (controlling for age and fluid intelligence) were examined in order to assess relationships between the variables. The initial hypothesised model included paths from a) theory of mind to social vulnerability; b) executive functioning and language ability to theory of mind; and c) executive functioning and language ability to social vulnerability.

Model fit was assessed through examination of the chi-square ($\chi^2$) statistic, Comparative Fit Index (CFI), Tucker Lewis Index (TFI), Adjusted Goodness of Fit Index (AGFI), root mean square error of approximation (RMSEA) and standardised root mean squared residual (SRMR) (Hooper, Coughlan, & Mullen, 2008; Hu & Bentler, 1999). Particular emphasis was placed on the CFI and SRMR as the power and robustness of these indices has been demonstrated for smaller sample sizes (Bentler, 1990; Hu & Bentler, 1999). In addition, model cross-validation indices (Akaike’s Inclusion Criteria [AIC] and Expected Cross Validation Index [ECVI]) were examined to compare the two models.

Results

As SEM is sensitive to outliers, univariate and multivariate outlier analyses were conducted. A test score was considered a univariate outlier if it was greater than 3 standard deviations from the mean (Kline, 2005), with only 1 identified. Due to the sensitivity of structural equation modelling to deviations from normality (Kline, 2005), this value was winsorised for analysis so that its absolute value was 3 standard deviations from the mean (Sheskin, 2003). No multivariate outliers were identified.

---

1 The root mean squared residual (RMSEA) has a tendency to over-reject true models in small samples (N ≤ 250; Iacobucci, 2010) so the SRMR was the preferred index in this study.
Descriptive statistics for the measure of social vulnerability (i.e., the CSVQ) and each of the cognitive tasks are presented in Table 3.1.

**Gender, Age and Socioeconomic Status Differences in Social Vulnerability**

To assess whether demographic variables needed to serve as covariates, relationships between the demographic variables and social vulnerability were explored. An independent samples t-test examining gender differences in social vulnerability demonstrated that there was no main effect of gender, \( p = .879 \). Similarly, an ANOVA demonstrated there was no main effect of socioeconomic status, \( p = .293 \). The relationship between age and social vulnerability was also non-significant, \( p = .904 \).

**Relationship between Social Vulnerability and Cognitive Mechanisms**

To assess the relationship between social vulnerability and the cognitive mechanisms, bivariate and partial correlations (controlling for age and fluid intelligence) were conducted. The partial correlations were conducted to control for any individual differences in age and fluid intelligence that may be influencing the relationship between social vulnerability and the cognitive and language variables. The results of the partial correlations identified that age and fluid intelligence were influencing the strength of the correlations, particularly with regard to the cognitive variables. Results are presented in Table 3.1.
Table 3.1

**Bivariate and partial correlations (controlling for age and fluid intelligence) between social vulnerability, executive functioning, language and theory of mind (n = 112).**

<table>
<thead>
<tr>
<th>Measure</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Social vulnerability</td>
<td>--</td>
<td>-14</td>
<td>-20*</td>
<td>-27**</td>
<td></td>
<td>9.25</td>
<td>5.64</td>
</tr>
<tr>
<td>2. Executive functioning</td>
<td>-15</td>
<td>--</td>
<td>20*</td>
<td>24*</td>
<td></td>
<td>0.02</td>
<td>2.14</td>
</tr>
<tr>
<td>3. Language ability</td>
<td>-18</td>
<td>40***</td>
<td>--</td>
<td>26**</td>
<td></td>
<td>135.10</td>
<td>16.50</td>
</tr>
<tr>
<td>4. Theory of mind</td>
<td>-26**</td>
<td>40***</td>
<td>44***</td>
<td>--</td>
<td></td>
<td>11.76</td>
<td>3.51</td>
</tr>
<tr>
<td>5. Fluid intelligence</td>
<td>-09</td>
<td>42***</td>
<td>32**</td>
<td>33***</td>
<td>--</td>
<td>11.88</td>
<td>4.27</td>
</tr>
<tr>
<td>6. Age</td>
<td>-01</td>
<td>39***</td>
<td>52***</td>
<td>40***</td>
<td>31**</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: Partial correlations controlling for age and fluid intelligence are shown above the diagonal (df = 108).

* p < .05, ** p < .01, *** p < .001

Social vulnerability was significantly related to theory of mind, with lower scores on the CSVQ associated with better performance on the strange stories task. There was a significant relationship between social vulnerability and language ability, with lower scores on the CSVQ associated with better performance on the PPVT after controlling for age and fluid intelligence. The relationship between social vulnerability and executive functioning was not significant. Furthermore, the correlations between each of the cognitive variables were significant, and in the hypothesised directions. That is, better performance on the executive functioning tasks were associated with better performance on the theory of mind task and the language task, and better performance on the theory of mind task was associated with better performance on the language task.

**Mediation Analysis**

To examine the direct and indirect effects of theory of mind, executive functioning and language ability on social vulnerability, a path analysis was conducted.
(initial model). Even though the relationship between executive functioning and social vulnerability was not significant, it was included in the model due to its hypothesised indirect effect on social vulnerability via theory of mind (Hayes, 2009). Age and fluid intelligence were included as covariates with the theory of mind task (strange stories task), executive functioning measure (EF composite score) and language task (PPVT) due to their associations with them. Examination of the initial model revealed that the paths from language ability (PPVT) to social vulnerability (CSVQ), and executive functioning (EF) to social vulnerability (CSVQ) were not significant, so they were removed from the model to improve parsimony (constrained model) (Kline, 2005). Fit indices for both the initial model and constrained model are presented in Table 3.2.

Table 3.2

Path model fit indices.

<table>
<thead>
<tr>
<th>Fit Index</th>
<th>Initial Model</th>
<th>Constrained Model</th>
</tr>
</thead>
<tbody>
<tr>
<td>CFI$^a$</td>
<td>.98</td>
<td>.99</td>
</tr>
<tr>
<td>TLI$^a$</td>
<td>.88</td>
<td>.98</td>
</tr>
<tr>
<td>AGFI$^a$</td>
<td>.88</td>
<td>.93</td>
</tr>
<tr>
<td>RMSEA$^b$ (lower and upper CI)</td>
<td>.09 [.00, .23]</td>
<td>.04 [.00, .15]</td>
</tr>
<tr>
<td>SRMR$^b$</td>
<td>.03</td>
<td>.03</td>
</tr>
<tr>
<td>AIC$^c$</td>
<td>41.93</td>
<td>38.62</td>
</tr>
<tr>
<td>ECVI$^c$ (lower and upper CI)</td>
<td>.38 [.36 - .47]</td>
<td>.35 [.34 - .43]</td>
</tr>
</tbody>
</table>

$a$ Ideal value $\geq 0.95$ (Hu & Bentler, 1999); $b$ Ideal value $\leq 0.06$ (Hu & Bentler, 1999);
$c$ Lower values indicate better relatively better fit and greater parsimony (Hu & Bentler, 1999)

Inspection of the chi-square statistics suggests that both models demonstrate an acceptable fit to the data. However, examination of the incremental fit indices indicates
that the constrained model provides a better fit. For the constrained model, the majority of fit indices met or exceeded recommended cut-off values, whereas for the initial model they did not. Additionally, the values of the cross-validation indices (AIC, ECVI) for the constrained model were lower in all instances. The constrained model is presented in Figure 3.1.
Figure 3.1. Path model and parameter estimates for the hypothesised relationship between the measures of theory of mind, executive functioning and language ability, and social vulnerability. Standardised regression coefficients are presented; the values next to the small single-headed arrows leading to the observed variables reflect the standardised residual variance. Covariates (age and fluid intelligence) are not depicted in the model.

* $p < .05$, ** $p < .01$, *** $p < .001$
The total variance explained by the model accounted for 6.8% of the variance in social vulnerability. Parameter estimates from executive functioning and language ability to theory of mind were significant. Furthermore, the pathway from theory of mind to social vulnerability was significant, with better performance on the theory of mind task associated with lower ratings of social vulnerability. Because the direct paths from language ability and executive functioning to social vulnerability did not make a significant contribution to the prediction of social vulnerability once theory of mind was taken into account, these findings suggest that theory of mind fully mediates the relationship between executive functioning and social vulnerability, and between language ability and social vulnerability.

**Discussion**

Social vulnerability is an important facet of children’s social interactions. In order to better understand this construct, the aim of this study was to investigate the cognitive mechanisms associated with individual differences in social vulnerability in typically developing children, specifically theory of mind, executive functioning and language comprehension. Each of these mechanisms were expected to predict individual differences in social vulnerability, with any relationship between executive functioning and language ability, and social vulnerability, potentially mediated through theory of mind. Correlational analyses provided support for an association between social vulnerability and language comprehension, and social vulnerability and theory of mind, but not between social vulnerability and executive functioning. However, importantly, the path analysis identified that theory of mind fully mediated the relationship of executive functioning and language ability with social vulnerability, demonstrating that higher levels of executive functioning and language ability were associated with higher levels of theory of mind, which in turn was associated with lower levels of social
vulnerability. Together these findings indicate that theory of mind is important to social vulnerability.

The findings from this study support past theoretical conceptualisations of social vulnerability that suggest that social intelligence may be an underlying feature of gullibility (Greenspan et al., 2001). In particular, the results support the assertion that deficits in theory of mind skills diminish a child’s ability to detect social cues that indicate deceit, which places them at risk of being exploited (Sofronoff et al., 2011). Additionally, the findings further extend the findings of Pinsker and McFarland (2010), who found associations between social vulnerability and theory of mind and executive functioning in older adults, to a sample of children. The findings indicate that it is an individual’s ability to understand others’ mental states, and that the thoughts and actions of others may be different to one’s own that is important for understanding social vulnerability in children.

Looking to the broader literature, the results from this study are consistent with research that highlights the importance of theory of mind for social interactions in children. Theory of mind has long been considered to be an important precursor to the development of behavioural abilities in children (Hughes & Leekam, 2004), with a vast amount of research identifying that theory of mind is associated with social functioning (e.g., Banerjee et al., 2011; Caputi et al., 2012; Fink et al., 2015; Imuta et al., 2016; Shakoor et al., 2012; Slaughter et al., 2015; Watson et al., 1999). The findings from this study converge with research that demonstrates that deficits in theory of mind skills lead to negative social experiences (Banerjee et al., 2011; Fink et al., 2015; Shakoor et al., 2012), and extend it to interactions that leave the child vulnerable to manipulation and deception. Additionally, these results provide support for the predictive relationship from executive functioning to theory of mind (e.g., Bock et al., 2015; Carlson et al.,

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2002; Carlson et al., 2004; Hughes & Ensor, 2011), and language ability to theory of mind (Filippova & Astington, 2008; Milligan et al., 2007) in children.

These findings may help explain age-related decreases evident in social vulnerability. Seward, Bayliss, et al. (2016a) demonstrated that parental perceptions of social vulnerability were greater for younger children compared to older children. It has been identified that theory of mind improves with age across childhood (Peterson et al., 2012), and that it continues to remain an important aspect of cognition for developing successful relationships as children age (e.g., Hughes & Leekam, 2004; Imuta et al., 2016). Therefore, it is possible that the developmental trend in social vulnerability is, at least in part, accounted for by advances in theory of mind. However, a longitudinal study design is required to determine whether this is the case.

Moreover, it is possible that deficits in theory of mind skills underlie heightened levels of social vulnerability evident in children with developmental disorders. Until now, it has been hypothesised that individuals with developmental disabilities are more socially vulnerable due to impaired cognitive functioning and a lack of social insight, both of which are thought to limit their ability to evaluate false claims and identify dangerous situations (Greenspan et al., 2001). Results from this study lend some support to this suggestion. For individuals with autism, this relationship seems intuitive as theory of mind impairments have been implicated in these individuals (e.g., Baron-Cohen, Joliffe, Mortimore, & Robertson, 1997). However, this relationship seems less clear for children with attention-deficit/hyperactivity disorder, as evidence of a theory of mind deficit in this population is limited and mixed (see Uekermann et al., 2010). Consequently, the extent to which these findings are applicable to clinical populations, and are able to explain heightened levels of social vulnerability within them, is unknown and warrants further research.
Limitations

There are a number of limitations to the current study. Foremost is the concurrent nature of the study, limiting our ability to use the current model to make judgments about the developmental trajectory of the relationship between the cognitive mechanisms and social vulnerability. Although we think it is the case that theory of mind deficits lead to heightened social vulnerability (as children who have difficulties understanding others’ mental states seem more likely to have difficulties understanding the underlying intention in social situations), there is current longitudinal research that provides evidence for a bi-directional relationship between theory of mind and social outcomes (Banerjee et al., 2011; Razza & Blair, 2009). Consequently, a longitudinal research design would be beneficial to furthering our understanding of the directionality of these relationships. Finally, the model presented only accounts for a small proportion of the variance in social vulnerability. Being able to detect deception occurs within a social environment so there are other factors that may underlie children’s ability to critically evaluate information indicative of deceit that were not considered in the current study. Mills (2013) suggests that to understand the ability to critically evaluate information we not only need to consider the characteristics of the child, but also the characteristics of the other peers involved in the social interaction and the characteristics of the interaction itself, indicating that these factors need to be considered in future research.

Conclusion

This was the first study to investigate the cognitive mechanisms associated with social vulnerability in typically developing children. Results highlight that theory of mind plays a direct role in children’s ability to detect deception in social situations, demonstrating that it is a child’s ability to understand others’ mental states and that the thoughts and actions of others may be different to one’s own that is important to
understanding why some children are more socially vulnerable than their peers. As research has demonstrated that poor peer relationships during childhood are associated with later adjustment problems, these results provide some insight into the cognitive mechanisms associated with such difficulties, pointing to theory of mind as an important cognitive mechanism in understanding children’s social exchanges. The results also suggest that the relationship between theory of mind and poor social functioning might, at least in part, be via social vulnerability. Given the association between social vulnerability and psychosocial maladjustment in children, including peer victimisation, understanding the factors contributing to social vulnerability is crucial as this may help to identify potential avenues for reducing risk of negative interpersonal experiences in children.
References


Verlinden, M., Veenstra, R., Ghassabian, A., Jansen, P. W., Hofman, A., Jaddoe, V. W.


Chapter 4  Social vulnerability predicts concurrent relational and overt peer victimisation

Abstract

Bullying is a significant social problem. Regardless of the type of bullying, children who are bullied manifest adjustment problems that endure into adolescence and adulthood. Given the pervasive and negative impact of peer victimisation, a comprehensive understanding of the factors that are associated with being bullied in typically developing children is crucial. One factor that is yet to be considered is social vulnerability (i.e., an impaired ability to detect potentially harmful interpersonal interactions). This study aimed to investigate whether social vulnerability contributes to peer victimisation in typically developing children. Participants were elementary school-aged children and their parents \((n = 194)\). Results demonstrated that parent-reported social vulnerability was associated with increased peer victimisation (both overt and relational), but not bullying behaviour. Moreover, social vulnerability contributed unique variance to the prediction of peer victimisation after accounting for psychosocial adjustment factors (internalising symptoms, externalising behaviours, prosocial behaviour and self-esteem). Together, the results provide support for social vulnerability as an important facet of children’s peer interactions, and indicate that social vulnerability can provide us with further insight into which children are at risk of being the victims of bullying.

KEYWORDS: Social vulnerability, peer victimisation, peer relationships, psychosocial adjustment, children.
Social vulnerability predicts concurrent relational and overt peer victimisation

Bullying in schools is a significant social issue. Prevalence rates across numerous countries indicate that 10% to 30% of children and youth are involved in bullying (Analitis et al., 2009; Berger, 2007; Nansel, Craig, Overpeck, Saluja, & Ruan, 2004), highlighting that bullying is a global problem. Peer victimisation (i.e., being bullied) occurs when a child is exposed, repeatedly and over time, to negative actions performed by another child (Olweus, 1993). These negative actions can be performed in many ways, including physically, verbally, relationally and/or online (cyber bullying). One of the most influential conceptualisations of peer victimisation is the distinction between overt (i.e., being harmed through physical or verbal means) and relational (i.e., being harmed through purposeful manipulation or damage to their peer relationships) aggression (Crick & Grotpeter, 1995, 1996). Children who are bullied, regardless of the type of bullying to which they are exposed, manifest adjustment problems, including internalising disorders, externalising disorders, social difficulties, self-harm and suicidal ideation (e.g., Arseneault, Bowes, & Shakoor, 2010; Espelage & Holt, 2013; Haltigan & Vaillancourt, 2014; Hanish & Guerra, 2002; Hawker & Boulton, 2000; Nansel et al., 2004). Moreover, the impact of bullying endures into adolescence and adulthood (Arseneault et al., 2006; Haltigan & Vaillancourt, 2014; Wolke, Copeland, Angold, & Costello, 2013; Wolke & Lereya, 2015).

Given the pervasive, enduring, and negative impact of peer victimisation, a comprehensive understanding of factors that are associated with being bullied in children is crucial. Unsurprisingly, there has been a wealth of research investigating individual, familial and community level factors that are associated with being bullied (e.g., Analitis et al., 2009; Arseneault et al., 2010; Barker et al., 2008; Hanish & Guerra, 2000a; Veenstra et al., 2005). At an individual level, internalising symptoms (withdrawn, anxious, depressed), externalising behaviours (defiant, aggressive,
disruptive, noncompliant), low self-esteem and poor social skills have consistently been identified as risk factors for becoming victims of bullying (Cook, Williams, Guerra, Kim, & Sadek, 2010; Hawker & Boulton, 2000). Of these, internalising symptoms and poor social skills demonstrate the greatest effect sizes (Cook et al., 2010). Furthermore, Cook et al. (2010) identified that many of these individual factors also correlated with being a bully; however, for bullying behaviour, externalising behaviours and negative thoughts about others (i.e., lack of empathy, poor perspective taking) were associated with the greatest effect sizes. Given the overlap between the correlates associated with peer victimisation and those associated with bullying behaviour, it is difficult to delineate children who are likely to be victims of bullying from those who are likely to engage in bullying behaviour. Moreover, many of the individual-level factors studied to date only account for a small proportion of variance in predicting victimisation and bullying behaviour (Cook et al., 2010). For example, a meta-analysis by Cook et al. (2010) demonstrated that internalising behaviours, one of the strongest predictors of being bullied, only explained 6.2% of the variance in victimisation. This suggests that there may be other factors that are important in identifying children at risk of peer victimisation.

One construct that has not yet been considered as a contributing factor to peer victimisation in typically developing children is social vulnerability. Social vulnerability refers to an impaired ability to detect or avoid potentially harmful interpersonal interactions (Pinsker, Stone, Pachana, & Greenspan, 2006), and involves both a tendency to believe something that is highly questionable despite limited evidence (credulity) and a vulnerability to being tricked or manipulated (gullibility). In children, this may manifest as being easily fooled or tricked by others. Although a tendency to be trusting is generally considered to be an adaptive attribute (Betts & Rotenberg, 2008; Rotter, 1980), difficulties understanding situations that involve
deception may leave an individual open to being deceived, misled, or cheated (Greenspan et al., 2001). Theoretical conceptualisations suggest that social vulnerability places children at risk of victimisation, rather than being the perpetrator of bullying (Greenspan, 2009; Greenspan, Loughlin, & Black, 2001). As such, social vulnerability may be a factor that distinguishes children who are victimised from those who engage in bullying behaviour.

Empirical research supports the suggestion that social vulnerability places children at risk of victimisation. Social vulnerability has been associated with a range of negative psychosocial consequences, including parent-reported internalising symptoms, externalising behaviours and poor social skills (Seward, Bayliss, & Ohan, 2016a; Sofronoff, Dark, & Stone, 2011). Moreover, Sofronoff et al. (2011) demonstrated that social vulnerability was the only unique predictor of peer victimisation in children with Asperger’s syndrome when entered in a model that included other aspects of psychosocial maladjustment (anger, anxiety, behavioural problems and social skills). Such a relationship between social vulnerability and victimisation is consistent with previous research suggesting that children who are highly trusting (or overly trusting and naïve) are subject to greater social difficulties than their peers, such as lower levels of social preference, fewer friendships and higher levels of social exclusion (Betts, Rotenberg, & Trueman, 2009; Rotenberg, Boulton, & Fox, 2005). Moreover, it points to social vulnerability as a potentially important facet of social interactions for children. However, the extent to which these findings extend to peer victimisation in typically developing children is unknown.

The overall aim of the current study was to investigate the relationship between social vulnerability and peer victimisation in elementary school-aged children. Specifically, we aimed to investigate the relationship between social vulnerability and both relational and overt peer victimisation, and if this relationship is unique to
victimisation and not bullying behaviour. We also aimed to examine whether social vulnerability contributes unique variance to the prediction of peer victimisation after controlling for psychosocial factors that have consistently been identified in the literature. To do this, parents of children aged 6- to 11-years were asked to complete measures of social vulnerability, peer victimisation, bullying behaviour, and psychosocial adjustment, and children were asked to complete a measure of self-esteem. Patterns of associations between social vulnerability, peer victimisation and bullying behaviour were examined, and regression analyses were conducted to ascertain any unique associations between social vulnerability and peer victimisation.

Method

Participants

One-hundred and ninety-four children (grade 1 – grade 6) and one of their parents participated in the study. Participants were recruited through elementary schools of varying socioeconomic status across the metropolitan area of a major city. Children who were indicated by their parents to have a diagnosis of an emotional, behavioural, and/or learning disorder were removed from the sample ($n = 13$). Additionally, data were discarded for three participants as their measures were incomplete. Therefore, the final sample consisted of 178 parents (86.5% mothers) and their children (50.6% girls). Children ranged in age from 6 years 1 month to 11 years 11 months ($M = 8.80, SD = 1.48$).

Parents self-identified their ethnicity as Australian (56.7%), British (18.0%), New Zealander (3.9%), Chinese (3.9%), and other (17.5%), and a wide range of income levels (before tax) were reported, ranging from less than $60K to in excess of $200K per year (median = $100,000 - $150,000).
Measures

**Demographics Questionnaire.** Parents were asked to provide background information regarding the participating child, including child’s age, gender, grade level, and relationship to the rater, as well as their own marital status, education level, socioeconomic status, family composition, and ethnicity. Parents were also asked for information regarding the diagnoses of medical illnesses or developmental difficulties.

**Children’s Social Vulnerability Questionnaire (CSVQ; Seward et al., 2016a).** The CSVQ was used to measure social vulnerability. It is an 8-item parent-report measure that asks parents to rate the extent to which their child engages in behaviours that indicate social vulnerability on a 5-point Likert scale (0 = never or very rarely, 4 = very often or always). The CSVQ has demonstrated good internal consistency (α = .86) and strong test re-test reliability over a 1 month period (r = .74) (Seward et al., 2016a). In this sample, internal consistency was very good (α = .86).

**Social Experience Questionnaire (SEQ; Crick & Grotpeter, 1996).** Overt and relational victimisation were measured using the SEQ. The SEQ was initially developed as a peer-report scale, and has since been used as a teacher-report (Cullerton-Sen & Crick, 2005) and parent-report scale (Sciberras, Ohan, & Anderson, 2012). In the current study, the parent-report version was administered. It consists of 13 items that map onto three subscales: relational victimisation (5 items), overt victimisation (3 items) and recipient of prosocial acts (5 items). For the purposes of this study, only the victimisation scales were used. Parents are asked to indicate the extent to which a number of statements can be used to describe their child’s social experiences on a 5-point scale (1 = Never True, 5 = Almost Always True). The SEQ has demonstrated good psychometric properties when used with parents, with good to very good internal consistency for the relational (α = .87) and the overt (α = .66) victimisation scales.
(Sciberras et al., 2012). For this study, the internal consistency was good to very good for the relational victimisation ($\alpha = .82$) and overt victimisation ($\alpha = .71$) scales.

**Children’s Social Behaviour Questionnaire (CSBQ; Crick, 1996).** Bullying behaviour (overt and relational) and prosocial behaviour were measured using the CSBQ. The CSBQ was initially developed as teacher-report scale (Crick, 1996), but was modified for use with parents in the current study, as has been done in past studies (e.g., Ohan & Johnston, 2007). It consists of 15 items on three subscales: relational aggression (7 items), overt aggression (4 items) and prosocial behaviour (4 items). Parents indicate the extent to which a number of statements can be used to describe their child’s social behaviour on a 5-point scale (1 = Never True, 5 = Almost Always True). The CSBQ has demonstrated good psychometric properties when used with parents (Ohan & Johnston, 2007). For this study, the internal consistency was good to very good for the relational aggression ($\alpha = .72$), overt aggression ($\alpha = .70$) and prosocial behaviour ($\alpha = .81$) subscales.

**Strengths and Difficulties Questionnaire (SDQ; Goodman, 1997).** The SDQ is a widely-used parent-rated measure of behavioural and emotional problems for children aged 3-16 years of age (Goodman, 1997). It contains 25 items that assess emotional symptoms, conduct problems, hyperactivity/inattention, peer relationship problems and prosocial behaviour, and has demonstrated adequate reliability and validity (e.g., Goodman, 2001; Stone, Otten, Engels, Vermulst, & Janssens, 2010). Parents are asked to rate the presence of each behaviour over the past 6 months on a 3-point scale (0 = not true, 1 = somewhat true, 2 = certainly true). In the current study, scores on the emotional symptoms and conduct problems subscales were used as indicators of internalising symptoms and externalising behaviours, respectively. In this study, internal consistency was low for the emotional symptoms ($\alpha = .53$) and conduct problems ($\alpha = .54$) subscales.
Self-Perception Profile for Children (SPPfC; Harter, 1985). The SPPfC was used to measure self-esteem. The SPPfC was developed as a measure of children’s self-concept. Children are verbally presented with two statements, and are required to decide which is most like him/her. They are then asked to decide whether the statement is “really true for me” or “sort of true for me.” The scale contains 36 items measuring global self-worth, as well as five specific domains of self-concept (i.e., scholastic competence, social competence, athletic competence, physical appearance, behavioural conduct). In this study, only the global self-worth scale (6 items) was administered to provide a measure of self-esteem. The scale is scored on a 4-point scale, whereby 4 represents the most adequate self-judgement and 1 represents the least adequate self-judgement (Harter, 1985). Therefore, the scale has a maximum score of 24 and a minimum score of 6. The scale has demonstrated good psychometric properties, with good internal reliability (α ranging from .78 - .87) (Harter, 1985). For this study, the internal consistency was adequate (α = .66).

Procedure

This study was approved by our University’s ethics committee. Parents and children were provided with an information sheet, and parental written consent and child assent was obtained. Parents were asked to complete a range of questionnaires measuring their child’s psychosocial functioning, including the CSVQ, CSBQ, SEQ and SDQ, as well as the demographics questionnaire. In addition, each child completed the SPPfC.

Results

Preliminary Analyses

Examination of the distribution of scores indicated that the majority of variables were normally distributed. However, high levels of skewness (i.e., skewness > 2; Curran, West, & Finch, 1996) and limited variability were identified in overt
victimisation and overt bullying behaviour scores that could not be corrected with transformations; thus, these variables were classified into dichotomous variables. For overt victimisation, children who were rated by their parents as not having experienced any overt bullying in the past 6 months were classified into a “not bullied” category (50.6% of participants) with remaining participants classified in a “bullied” category. Likewise, for overt bullying behaviour, children who were rated by their parents as not having participated in any overt bullying in the past 6 months were classified into a “no bullying behaviour” category (75.8% of participants) with all other participants classified in a “bullying behaviour” category. Screening of the data revealed only a small number of outliers (|z| ≥ 3; Kline, 2005) on the CSBQ, SDQ and SPPfC (1.2% of cases), and so, all data were retained for final analysis¹ (Cohen, Cohen, West, & Aiken, 2003). Descriptive statistics for social vulnerability, peer victimisation, bullying behaviour, and the psychosocial adjustment variables are presented in Table 4.1.

¹ These cases were deemed to be valid given the nature of the data (Meyers, Gamst & Guarino, 2013). In addition, analyses were conducted using both the original data and data when the value of the outliers were winsorised (i.e. absolute value was 3 standard deviations from the mean; Sheskin, 2003), and indicated the same pattern of results.
Table 4.1

Descriptive statistics for social vulnerability, victimisation, bullying behaviour and psychosocial adjustment (n = 178).

<table>
<thead>
<tr>
<th>Variable</th>
<th>M</th>
<th>SD</th>
<th>Min</th>
<th>Max</th>
<th>Possible score range</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Social vulnerability</td>
<td>9.12</td>
<td>6.11</td>
<td>0</td>
<td>27</td>
<td>0 – 32</td>
</tr>
<tr>
<td>2. Relational victimisation</td>
<td>9.87</td>
<td>4.19</td>
<td>5</td>
<td>22</td>
<td>5 – 25</td>
</tr>
<tr>
<td>3. Overt victimisation</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>4. Relational bullying behaviour</td>
<td>10.11</td>
<td>3.17</td>
<td>7</td>
<td>23</td>
<td>7 – 35</td>
</tr>
<tr>
<td>5. Overt bullying behaviour</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>6. Prosocial behaviour</td>
<td>16.65</td>
<td>3.16</td>
<td>4</td>
<td>20</td>
<td>4 – 20</td>
</tr>
<tr>
<td>7. Self-esteem</td>
<td>20.08</td>
<td>3.26</td>
<td>7</td>
<td>24</td>
<td>6 – 24</td>
</tr>
<tr>
<td>8. Emotional symptoms</td>
<td>2.11</td>
<td>1.89</td>
<td>0</td>
<td>10</td>
<td>0 – 10</td>
</tr>
<tr>
<td>9. Conduct problems</td>
<td>1.18</td>
<td>1.31</td>
<td>0</td>
<td>6</td>
<td>0 – 10</td>
</tr>
</tbody>
</table>

Demographic differences in peer victimisation and bullying behaviour

To assess whether demographic variables needed to serve as covariates, relationships between the demographic variables and victimisation and bullying behaviour were explored. An independent samples t-test examined gender (male, female) differences in relational peer victimisation and relational bullying behaviour. There was no main effect of gender for relational victimisation or relational bullying behaviour (all ps > .05). For overt victimisation and bullying behaviour, Pearson chi-square tests demonstrated that boys were more likely to be overtly victimised than girls, \( \chi^2 (1) = 5.05, p = .025 \), and that there was no difference in overt bullying behaviour between genders (\( p = .097 \)).
An ANOVA examined socioeconomic status (as indicated by family income before tax) differences in relational peer victimisation and relational bullying behaviour. There was no main effect of socioeconomic status for relational victimisation or relational bullying behaviour (all $ps > .05$). For overt victimisation and bullying behaviour, Pearson chi-square tests demonstrated that there was no difference in overt victimisation or bullying behaviour between socioeconomic status groups (all $ps > .05$).

Finally, correlations between age and victimisation and bullying behaviour were not significant ($rs$ [df = 176] ranged from -.11 to .12, all $ps > .05$), and thus, age was not covaried in any further analyses.

**Relationship between Social Vulnerability, Peer Victimisation and Bullying Behaviour**

To assess the relationships between social vulnerability, peer victimisation and bullying behaviour, correlations were conducted (see Table 4.2). Higher social vulnerability was associated with higher levels of relational and overt victimisation. Social vulnerability was not, however, associated with relational or overt bullying behaviour. Moreover, higher levels of social vulnerability were associated with higher levels of emotional symptoms and conduct problems, but were not related to self-esteem or prosocial behaviour.
Table 4.2

*Correlations between social vulnerability, victimisation, bullying behaviour and psychosocial adjustment (n = 178).*

<table>
<thead>
<tr>
<th>Variable</th>
<th>1.</th>
<th>2.</th>
<th>3.</th>
<th>4.</th>
<th>5.</th>
<th>6.</th>
<th>7.</th>
<th>8.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Social vulnerability</td>
<td>--</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Relational victimisation</td>
<td>.34***</td>
<td>--</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Overt victimisation</td>
<td>.37***</td>
<td>.44***</td>
<td>--</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Relational bullying behaviour</td>
<td>.14</td>
<td>.33***</td>
<td>.28***</td>
<td>--</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Overt bullying behaviour</td>
<td>.09</td>
<td>.14</td>
<td>.15*</td>
<td>.46***</td>
<td>--</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Prosocial behaviour</td>
<td>-.04</td>
<td>.00</td>
<td>-.04</td>
<td>-.08</td>
<td>-.25**</td>
<td>--</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Self-esteem</td>
<td>-.12</td>
<td>-.18*</td>
<td>-.01</td>
<td>-.20**</td>
<td>-.07</td>
<td>-.02</td>
<td>--</td>
<td></td>
</tr>
<tr>
<td>8. Emotional symptoms</td>
<td>.21**</td>
<td>.20**</td>
<td>.23**</td>
<td>-.01</td>
<td>-.12</td>
<td>-.04</td>
<td>-.13</td>
<td>--</td>
</tr>
<tr>
<td>9. Conduct problems</td>
<td>.20**</td>
<td>.15*</td>
<td>.12</td>
<td>.40***</td>
<td>.43***</td>
<td>-.30***</td>
<td>-.08</td>
<td>.03</td>
</tr>
</tbody>
</table>

*a Correlations are point biserial.

* p <.05, ** p <.01, *** p <.001*
The relationship between social vulnerability and bullying behaviour was further examined by estimating a Bayes factor using the JZF method which compares the fit of the data under the null hypothesis and the alternative hypothesis (see http://pcl.missouri.edu/bf-reg; Rouder & Morey, 2012). For the correlation between social vulnerability and relational bullying behaviour, the estimated JZF Bayes factor was .83. For the correlation between social vulnerability and overt bullying behaviour, the estimated JZF Bayes factor was .32. Both results were in support of the null hypothesis, providing anecdotal and substantial evidence, respectively (Wetzels & Wagenmakers, 2012). Therefore, suggesting that there is no relationship between social vulnerability and bullying behaviour.

**Prediction of Relational and Overt Peer Victimisation**

Separate hierarchical regressions were conducted to determine whether social vulnerability significantly predicted relational peer victimisation and overt peer victimisation over and above the psychosocial factors. In each analysis, emotional symptoms, conduct problems, prosocial behaviour and self-esteem were entered into the model at Step 1, followed by social vulnerability at Step 2.

For relational victimisation, emotional symptoms, conduct problems, prosocial behaviour and self-esteem together accounted for 6.4% (adjusted $R^2$) of the variance in relational victimisation, $F (4, 173) = 4.03, p = .004$. At this step, emotional symptoms and self-esteem each contributed unique variance to the prediction of relational victimisation. When social vulnerability was included in the model at Step 2, it accounted for an additional 7.5% of the variance in relational victimisation, $F (1, 172) = 15.39, p < .001$. At Step 2, only social vulnerability contributed unique variance to the prediction of relational victimisation, with higher levels of social vulnerability associated with higher levels of relational victimisation. The results are presented in Table 4.3.
Table 4.3

_Hierarchical multiple regression, with relational victimisation as the outcome variable, and emotional symptoms, conduct problems, prosocial behaviour, self-esteem and social vulnerability as the predictor variables (N = 178)._  

<table>
<thead>
<tr>
<th>Relational Victimisation</th>
<th>B</th>
<th>SE B</th>
<th>β</th>
<th>Δ R²</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong></td>
<td></td>
<td></td>
<td></td>
<td>6.4%**</td>
</tr>
<tr>
<td>Emotional symptoms</td>
<td>.39</td>
<td>.16</td>
<td>.18**</td>
<td></td>
</tr>
<tr>
<td>Conduct problems</td>
<td>.48</td>
<td>.24</td>
<td>.15</td>
<td></td>
</tr>
<tr>
<td>Prosocial behaviour</td>
<td>.07</td>
<td>.10</td>
<td>.05</td>
<td></td>
</tr>
<tr>
<td>Self-esteem</td>
<td>-.19</td>
<td>.09</td>
<td>-.15*</td>
<td></td>
</tr>
<tr>
<td><strong>Step 2</strong></td>
<td></td>
<td></td>
<td></td>
<td>7.5%***</td>
</tr>
<tr>
<td>Emotional symptoms</td>
<td>.27</td>
<td>.16</td>
<td>.12</td>
<td></td>
</tr>
<tr>
<td>Conduct problems</td>
<td>.30</td>
<td>.24</td>
<td>.09</td>
<td></td>
</tr>
<tr>
<td>Prosocial behaviour</td>
<td>.06</td>
<td>.10</td>
<td>.04</td>
<td></td>
</tr>
<tr>
<td>Self-esteem</td>
<td>-.16</td>
<td>.09</td>
<td>-.12</td>
<td></td>
</tr>
<tr>
<td>Social vulnerability</td>
<td>.20</td>
<td>.05</td>
<td>.29***</td>
<td></td>
</tr>
</tbody>
</table>

* p < .05, ** p < .01, *** p < .001

A binomial logistic regression was used to assess whether social vulnerability significantly predicted overt victimisation after accounting for psychosocial factors. Due to the relationship between overt victimisation and gender, we included a social vulnerability x gender interaction term in the logistic regression model to determine whether social vulnerability was associated with victimisation differentially by gender (male = 0, female = 1). The interaction term was significant in the model (p = .008), suggesting that gender influenced the relationship between social vulnerability and
overt victimisation. Therefore, analyses were run separately for boys and girls. The results are presented in Table 4.4.
Table 4.4

Binomial logistic regression, with overt victimisation as the outcome variable (0 = not bullied, 1 = bullied), and emotional symptoms, conduct problems, prosocial behaviour, self-esteem and social vulnerability as the predictor variables.

<table>
<thead>
<tr>
<th>Overt Victimisation – Boys (N = 88)</th>
<th>B</th>
<th>SE B</th>
<th>Exp (B)</th>
<th>95% CI</th>
<th>Nagelkerke R²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>14.0%</td>
</tr>
<tr>
<td>Emotional symptoms</td>
<td>.24</td>
<td>.14</td>
<td>1.27</td>
<td>[.97, 1.66]</td>
<td></td>
</tr>
<tr>
<td>Conduct problems</td>
<td>.38</td>
<td>.19</td>
<td>1.47*</td>
<td>[1.01, 2.14]</td>
<td></td>
</tr>
<tr>
<td>Prosocial behaviour</td>
<td>.14</td>
<td>.08</td>
<td>1.15</td>
<td>[.98, 1.34]</td>
<td></td>
</tr>
<tr>
<td>Self-esteem</td>
<td>.00</td>
<td>.10</td>
<td>1.00</td>
<td>[.82, 1.21]</td>
<td></td>
</tr>
<tr>
<td>Step 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>35.4%</td>
</tr>
<tr>
<td>Emotional symptoms</td>
<td>.26</td>
<td>.16</td>
<td>1.29</td>
<td>[.94, 1.76]</td>
<td></td>
</tr>
<tr>
<td>Conduct problems</td>
<td>.18</td>
<td>.21</td>
<td>1.20</td>
<td>[.80, 1.81]</td>
<td></td>
</tr>
<tr>
<td>Prosocial behaviour</td>
<td>.14</td>
<td>.09</td>
<td>1.16</td>
<td>[.96, 1.39]</td>
<td></td>
</tr>
<tr>
<td>Self-esteem</td>
<td>.01</td>
<td>.11</td>
<td>1.01</td>
<td>[.81, 1.26]</td>
<td></td>
</tr>
<tr>
<td>Social vulnerability</td>
<td>.21</td>
<td>.06</td>
<td>1.23**</td>
<td>[1.10, 1.39]</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Overt Victimisation – Girls (N = 90)</th>
<th>B</th>
<th>SE B</th>
<th>Exp (B)</th>
<th>95% CI</th>
<th>Nagelkerke R²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>12.3%</td>
</tr>
<tr>
<td>Emotional symptoms</td>
<td>.33</td>
<td>.13</td>
<td>1.40*</td>
<td>[1.07, 1.82]</td>
<td></td>
</tr>
<tr>
<td>Conduct problems</td>
<td>.04</td>
<td>.19</td>
<td>1.04</td>
<td>[.71, 1.52]</td>
<td></td>
</tr>
<tr>
<td>Prosocial behaviour</td>
<td>-.10</td>
<td>.07</td>
<td>.91</td>
<td>[.78, 1.05]</td>
<td></td>
</tr>
<tr>
<td>Self-esteem</td>
<td>-.01</td>
<td>.06</td>
<td>.99</td>
<td>[.88, 1.21]</td>
<td></td>
</tr>
<tr>
<td>Step 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>17.8%</td>
</tr>
<tr>
<td>Emotional symptoms</td>
<td>.27</td>
<td>.14</td>
<td>1.31</td>
<td>[.99, 1.72]</td>
<td></td>
</tr>
<tr>
<td>Conduct problems</td>
<td>.01</td>
<td>.20</td>
<td>1.01</td>
<td>[.68, 1.48]</td>
<td></td>
</tr>
<tr>
<td>Prosocial behaviour</td>
<td>-.10</td>
<td>.07</td>
<td>.91</td>
<td>[.78, 1.05]</td>
<td></td>
</tr>
<tr>
<td>Self-esteem</td>
<td>.01</td>
<td>.06</td>
<td>1.01</td>
<td>[.89, 1.15]</td>
<td></td>
</tr>
<tr>
<td>Social vulnerability</td>
<td>.08</td>
<td>.04</td>
<td>1.08*</td>
<td>[1.00, 1.17]</td>
<td></td>
</tr>
</tbody>
</table>

* p < .05, ** p < .01, *** p < .001

For boys, emotional symptoms, conduct problems, prosocial behaviour and self-esteem accounted for 14.0% (Nagelkerke R²) of the variance in overt victimisation, \( \chi^2 \)
(4) = 9.64, p = .047. At this step, conduct problems was the only significant predictor. When social vulnerability was included in the model, the final model was statistically significant, \( \chi^2 (5) = 26.87, p < .001 \), with the model explaining 35.4\% (Nagelkerke R\(^2\)) of the variance in overt victimisation. Including social vulnerability in the model at Step 2 resulted in a significant improvement in the fit of the model, \( \chi^2 (1) = 17.23, p < .001 \). At this step, only social vulnerability contributed unique variance to the prediction of overt victimisation, with higher levels of social vulnerability associated with increased odds of experiencing overt victimisation.

For girls, emotional symptoms, conduct problems, prosocial behaviour and self-esteem accounted for 12.3\% (Nagelkerke R\(^2\)) of the variance in overt victimisation; however, this model was not statistically significant, \( \chi^2 (4) = 8.58, p = .072 \). When social vulnerability was included in the model, the final model was statistically significant, \( \chi^2 (5) = 12.78, p = .026 \), with the model explaining 17.8\% (Nagelkerke R\(^2\)) of the variance in overt victimisation. The results demonstrate that including social vulnerability in the model at Step 2 resulted in a significant improvement in the fit of the model, \( \chi^2 (1) = 4.20, p = .041 \). At this step, only social vulnerability contributed unique variance to the prediction of overt victimisation, with higher levels of social vulnerability associated with increased odds of experiencing overt victimisation.

**Discussion**

The current study aimed to investigate the association between social vulnerability and peer victimisation in elementary school-aged children. Findings demonstrated that social vulnerability plays an important role in predicting both overt and relational peer victimisation, even after accounting for well-established predictors of victimisation. Thus, these results extend those of Sofronoff et al. (2011), who showed that social vulnerability uniquely predicted peer victimisation in children with Asperger’s syndrome, to a typically developing population of children.
In our study, social vulnerability was associated with both overt and relational peer victimisation. Social vulnerability was not, however, associated with bullying behaviour, which was supported further by Bayesian analyses. Together, this pattern of results indicates that there is a relationship between social vulnerability and peer victimisation, but not between social vulnerability and bullying behaviour. These results therefore suggest that a tendency to be tricked or fooled by peers is associated with being the target, but not perpetrator, of negative interpersonal experiences, thus supporting Greenspan’s (2009) theoretical conceptualisation of social vulnerability. This finding is in contrast to many of the risk factors for being bullied that are currently identified, such as internalising symptoms and externalising behaviours, as these share associations with both being a victim and being a bully (Cook et al., 2010). Consequently, this makes social vulnerability unique in helping us understand which factors place children at risk for being bullied, rather than for being a bully.

Regression analyses demonstrated that social vulnerability added unique variance to the prediction of both overt and relational victimisation, over and above other psychosocial factors (emotional symptoms, conduct problems, prosocial behaviour and self-esteem) that are currently recognised as predictors of being bullied within the literature (e.g., Cook et al., 2010). For relational victimisation, emotional symptoms and self-esteem were significant predictors prior to entering social vulnerability into the model. For overt victimisation, conduct problems was a significant predictor for boys, and emotional symptoms was a significant predictor for girls. These findings support past research demonstrating the significance of internalising behaviours, externalising behaviours and self-esteem to the prediction of peer victimisation (e.g., Cook et al., 2010; Egan & Perry, 1998; Hodges & Perry, 1999; Reijntjes et al., 2011; Reijntjes, Kamphuis, Prinzie, & Telch, 2010). However, once social vulnerability was included in the regression models, it was the only significant
predictor of both relational and overt victimisation. Together, these results suggest that social vulnerability plays a crucial role in predicting concurrent victimisation for typically developing children, over and above factors that have consistently been identified in the literature.

Importantly, the current study demonstrated that for relational victimisation and overt victimisation in boys, social vulnerability contributed more to their prediction than our best-known individual level predictors of victimisation combined. Taking relational victimisation as an example, social vulnerability contributed an additional 7.5% of variance to its prediction, whilst emotional symptoms, conduct problems, prosocial behaviour and self-esteem combined accounted for 6.4% of the variance. These results implicate social vulnerability as an important predictor of peer victimisation in typically developing children, and indicate that social vulnerability is a construct that should be considered in models of peer victimisation.

Researchers have suggested that victims of bullying display a behavioural vulnerability that signals to perpetrators that they are easy targets (Fox & Boulton, 2005; Hodges, Malone, & Perry, 1997). For example, internalising behaviours are purported to increase victimisation because they signal to perpetrators that the child is unable to defend themselves against attacks (Hodges & Perry, 1999). Externalising behaviours (disruptive, provocative behaviours) on the other hand are thought to frequently antagonise aggressive children and motivate them to retaliate (Hanish & Guerra, 2000b; Hodges & Perry, 1999). With regard to social vulnerability, such behaviours may also signal a behavioural vulnerability to perpetrators, as a propensity to being easily deceived or manipulated may indicate that the child is an easy target. Moreover, a tendency towards credulity and gullibility might maintain victimisation as children continually place themselves in situations that involve risk. Alternatively, it is possible that children who are socially vulnerable are at an increased risk for
experiencing peer victimisation because they deviate from group norms. Rotenberg et al. (2005) hypothesised that the reason children who are highly trusting are subject to greater peer difficulties is because they display a naïve orientation in comparison to their peers and behave in ways consistent with this orientation. This deviation from group norms places them at risk of peer rejection. Additionally, a naïve disposition (such as social vulnerability) may leave children open to being betrayed by their peers which may weaken their peer relationships (Rotenberg et al., 2005). Consequently, it is possible that social vulnerability might be an extreme example of a highly trusting nature that is specific to the social arena, and therefore underlies difficulties in peer relationships.

Limitations

There are a number of limitations to the current study. Foremost was the concurrent design of the study. Whilst these results shed light on the concurrent correlates of peer victimisation, longitudinal data is required to fully understand the antecedents of victimisation, and whether social vulnerability is an important predictor of peer victimisation.

Secondly, internal consistency values for the SDQ subscales in the current study were low. This therefore may have limited the ability of the SDQ to relate to the other variables. However, the SDQ still demonstrated associations with variables as would be expected, for example, there was a moderate, positive association between the SDQ conduct problems subscale and bullying behaviour. Additionally, the internal consistency values reported in the current study were within the range of values that have been reported in other studies (see Stone et al., 2010). Therefore, we do not consider this to be a major limitation.

Finally, we relied on parents’ reports of social vulnerability and other behaviours. Parents vary in the degree to which they know about their child’s social
functioning because they may not always be present in situations that involve peer interactions. Moreover, using parents as the only reporter about their child’s behaviour introduces shared method variance, potentially leading to inflated associations between the measures. Future research could employ a multi-informant approach, using ratings from the children themselves and/or teachers, to enhance the robustness of the results. Nonetheless, the current study demonstrates that social vulnerability is associated with social interaction difficulties for typically developing children.

**Conclusion**

Social interactions are extremely complex and require a vast array of skills. Social vulnerability has not traditionally been considered to be an important part of children’s social exchanges. The results from this study offer us key insights into what places a child at risk for experiencing negative peer interactions, demonstrating that social vulnerability plays an important role in predicting both overt and relational victimisation for typically developing children. These results implicate social vulnerability as a potentially important facet in helping to identify children who are at greatest risk of experiencing bullying.

There has been no shortage of research documenting the short-term and enduring impacts of being bullied (e.g., Arseneault et al., 2006; Nansel et al., 2004; Wolke et al., 2013), and the individual-level risk factors associated with being bullied (e.g., Cook et al., 2010). The findings from this study indicate that our current empirical and theoretical understanding of individual-level risk factors may need to be altered to include social vulnerability. Moreover, the findings suggest that social vulnerability may be important in identifying children who are at greatest risk of experiencing bullying in order to implement interventions to reduce this risk.
References


Chapter 5  Social vulnerability as a predictor of later psychosocial adjustment

Abstract

Social vulnerability refers to an impaired ability to detect or avoid potentially harmful interpersonal interactions. Research has demonstrated that social vulnerability is an important construct for understanding risk of negative peer interactions and psychological maladjustment in children. However, these findings have been restricted to concurrent study designs, which limit the ability to draw conclusions regarding the directionality of these relationships. The aim of the current study was to explore whether social vulnerability predicts the peer interactions and psychological adjustment of typically developing children 1 year later. Participants were parents of elementary school-aged children (n = 118) who completed measures of their child’s social vulnerability, peer victimisation, bullying behaviour, prosocial behaviours and psychological adjustment 1 year apart. Social vulnerability was concurrently associated with peer victimisation and internalising symptoms at both time points, with greater levels of social vulnerability associated with greater difficulties. However, baseline levels of social vulnerability were not associated with risk of future psychosocial adjustment difficulties. This suggests that although social vulnerability is important for understanding the concurrent risk of experiencing psychosocial difficulties, social vulnerability is not predictive of future psychosocial difficulties.

KEYWORDS: Social vulnerability, peer interactions, peer victimisation, psychosocial adjustment, internalising symptoms, longitudinal, children.
Social vulnerability as a predictor of later psychosocial adjustment

Social vulnerability refers to an impaired ability to detect or avoid potentially harmful interpersonal interactions (Pinsker, Stone, Pachana, & Greenspan, 2006). It involves both a tendency to believe something that is highly questionable despite limited evidence (credulity), and a vulnerability to being tricked or manipulated (gullibility) (Greenspan, Loughlin, & Black, 2001). Social vulnerability is an aspect of social interactions that is considered to be distinct from social skills (Greenspan et al., 2001). In children, it may manifest as being easily fooled or tricked by others. It has been suggested that the ability to function effectively in social situations requires individuals to identify situations where involvement may lead to negative consequences, with difficulties understanding situations that involve deception thought to leave an individual open to being deceived, misled, or cheated (Greenspan et al., 2001). Therefore, being socially vulnerable is believed to diminish a person’s capacity to interact in social situations and contribute to negative interpersonal experiences (Greenspan et al., 2001).

Being socially vulnerable may have additional social, emotional and behavioural consequences for children. Theoretically, social vulnerability has been purported to place children at risk of victimisation (Greenspan et al., 2001). Displaying socially vulnerable behaviours, such as a tendency towards being deceived or manipulated, may indicate to perpetrators that such children are an easy target for victimisation, which therefore places them at risk of experiencing victimisation (Seward, Ohan, & Bayliss, 2016a). Additionally, over time, social vulnerability may lead to psychological maladjustment as children struggle to come to terms with how they are easily fooled and the negative consequences of being misled. Therefore, social vulnerability has the potential to provide us with insight into how children relate to each other in a way that is not currently captured in measures of social skills or peer interactions, but which may
influence their psychosocial adjustment over time. This is of importance because social, emotional and behavioural problems are prevalent amongst children (e.g., Arseneault, Bowes, & Shakoor, 2010; Merikangas et al., 2010; Sawyer et al., 2001), many of which persist into adolescence and adulthood (e.g., Arseneault, Bowes, & Shakoor, 2010; Kessler et al., 2005). Therefore, identifying risk-factors associated with the development of social, emotional and behavioural problems in childhood is crucial to enable the implementation of interventions to prevent such problems from persisting into later life. As such research into whether social vulnerability does in fact underlie psychosocial difficulties in children is necessary.

In socially at-risk populations, research has shown that social vulnerability is associated with psychosocial maladjustment (Fisher, Moskowitz, & Hodapp, 2012; Sofronoff, Dark, & Stone, 2011). For example, Fisher et al. (2012) demonstrated that in adolescents and adults with an intellectual disability, social vulnerability was associated with internalising symptoms and externalising behaviours. Additionally, the authors hypothesised that social vulnerability may help explain why individuals with developmental disabilities are at increased risk for experiencing victimisation (Fisher et al., 2012; Fisher, Moskowitz, & Hodapp, 2013). In another study, Sofronoff and colleagues (2011) indicated that social vulnerability was elevated in children with Asperger’s syndrome in comparison to typically developing children. Moreover, they demonstrated that social vulnerability was associated with poorer social skills and higher levels of anxiety, anger, behavioural problems and peer victimisation. Importantly, social vulnerability was the only unique predictor of peer victimisation within this sample when combined with these other psychosocial factors. Together, these studies indicate that, in at-risk populations, social vulnerability is heightened and is associated with psychological maladjustment and peer interaction difficulties.
Recent research has identified social vulnerability as a correlate of psychosocial adjustment for typically developing children as well (Seward, Bayliss, & Ohan, 2016a; Seward, Ohan, et al., 2016a). In three samples of elementary school children, social vulnerability was concurrently associated with internalising symptoms and externalising behaviours, with greater levels of social vulnerability associated with greater psychological difficulties (Seward, Bayliss, et al., 2016a; Seward, Ohan, et al., 2016a). Additionally, social vulnerability only demonstrated a small relation with prosocial skills, providing support for the hypothesis that social vulnerability is an aspect of children’s social functioning that is distinct from social skills (Greenspan et al., 2001). Social vulnerability has also been identified as an important facet of children’s peer interactions. Specifically, Seward, Ohan, et al. (2016a) demonstrated that, although social vulnerability was not associated with engaging in bullying (overt or relational), it was associated with peer victimisation (both overt and relational). The authors interpreted this pattern of results to indicate that a tendency to be tricked or fooled by peers is associated with being the target of bullying, but not being a perpetrator. This supports the theoretical conceptualisation of social vulnerability proposed by Greenspan et al. (2001). Furthermore, Seward, Ohan, et al. (2016a) found that social vulnerability added unique variance to the prediction of both overt and relational victimisation, over and above other psychosocial factors that are recognised as predictors of being bullied within the literature (e.g., Cook, Williams, Guerra, Kim, & Sadek, 2010). For overt victimisation in boys and relational victimisation in both genders, social vulnerability explained more variance than the best known individual-level predictors of victimisation combined, including internalising symptoms, externalising behaviours, social skills and self-esteem. Together, these results suggest that social vulnerability is an important predictor of concurrent victimisation in typically developing children. Moreover, this research suggests that being socially vulnerable may have a cumulative
negative impact on children, as social vulnerability not only places children at a greater risk of experiencing peer victimisation, but is also associated with psychological maladjustment.

Whilst this research has shed light on the concurrent correlates of social vulnerability, implicating social vulnerability as a potential precursor to the development of internalising symptoms, externalising behaviours and peer victimisation in typically developing children, the cross-sectional nature of these studies precludes definitive conclusions regarding the directionality of these relationships. As such, a longitudinal study is required to determine whether social vulnerability is a precursor to the development of psychosocial difficulties. Moreover, understanding the extent to which social vulnerability may serve as a risk factor in the development of peer victimisation and psychological maladjustment is important for the treatment and prevention of such difficulties. Therefore, the aim of the current study was to enhance our understanding of the psychosocial consequences of social vulnerability by examining whether social vulnerability predicts later peer interactions and psychological adjustment in children.

To accomplish this goal, we examined the extent to which social vulnerability at baseline is related to peer interactions and psychological adjustment 1 year later. Of specific interest were the longitudinal relationships between social vulnerability and peer victimisation, internalising symptoms and externalising behaviours, due to their documented associations in past research (Seward, Bayliss, et al., 2016a; Seward, Ohan, et al., 2016a). Bullying behaviour and prosocial behaviours were also included to provide further support for the hypothesis that social vulnerability is distinct from these aspects of peer interactions (Seward, Bayliss, et al., 2016a; Seward, Ohan, et al., 2016a). To accomplish this, parents of children aged 6- to 8-years completed measures of social vulnerability, peer interactions (peer victimisation, bullying behaviour,
prosocial behaviours), and psychological adjustment (internalising symptoms, externalising behaviours) at the start of the study, and then again 1 year later. Patterns of associations between social vulnerability at Time 1, and peer interactions and psychological adjustment at Time 2 were examined to assess whether social vulnerability predicts later psychosocial functioning, and whether these associations remain apparent after controlling for the relevant Time 1 outcome variable.

Method

Participants

Participants were parents of 118 children (grade 1 – grade 3) who participated as part of a larger study (Seward, Ohan, et al., 2016a). Participants were recruited through elementary schools of varying size and socioeconomic status across the metropolitan area of a major city. Children who were indicated to have a diagnosis of an emotional, behavioural, and/or learning disorder were removed from the sample (n = 3). Additionally, four sets of data were incomplete. Therefore, the initial sample consisted of 111 parents (94.6 % mothers) and their children. There were 51 girls (45.5%) and 61 boys, ranging in age from 6 years 1 month to 9 years 2 months (M = 7.76, SD = .73). Of the initial sample, 83% (n = 92) completed the 1 year follow-up assessment. At follow-up, the final sample consisted of parents (93.5% mothers) of 42 girls (45.7%) and 50 boys, ranging in age from 7 years 1 month to 9 years 11 months (M = 8.73, SD = .74). Parents self-identified their ethnicity as Australian (59.8%), British (18.5%), New Zealander (4.3%), Chinese (2.2%), and other (15.2%), and a wide range of income levels (before tax) were reported, ranging from less than $60K to in excess of $200K per year (median = $100,000 - $150,000).

No differences in age, gender, ethnicity or baseline levels of social vulnerability, peer interactions or psychological adjustment were found between children who participated at both data points and those who did not (all ps > .05).
were, however, differences in income between the two groups, with a greater percentage of participants in the lower income categories not completing the follow-up measures, \( \chi^2 (8) = 16.26, p = .039 \).

**Measures**

**Demographics Questionnaire.** Parents were asked to provide background information regarding the participating child, including child’s age, gender, grade level, and relationship to the rater, as well as their own marital status, education level, socioeconomic status, family composition, and ethnicity. Parents were also asked for information regarding the diagnoses of medical illnesses or developmental difficulties.

**Children’s Social Vulnerability Questionnaire (CSVQ; Seward, Bayliss, et al., 2016a).** The CSVQ was used to measure social vulnerability. The CSVQ is an 8-item parent-report measure that asks parents to rate the extent to which their child engages in behaviours that indicate social vulnerability on a 5-point Likert scale (0 = never or very rarely, 4 = very often or always). The CSVQ has demonstrated good internal consistency (\( \alpha = .86 \)) and strong test re-test reliability over a 1 month period (\( r = .74 \)) (Seward, Bayliss, et al., 2016a). In this sample, internal consistency was very good (T1 \( \alpha = .84 \); T2 \( \alpha = .88 \)).

**Social Experience Questionnaire (SEQ; Crick & Grotpeter, 1996).** Overt and relational victimisation were measured using the parent-report version of the SEQ. The SEQ consists of 13 items that map onto three subscales: relational victimisation (5 items), overt victimisation (3 items) and recipient of prosocial acts (5 items). The victimisation scales were used in this study. Parents are asked to indicate the extent to which a number of statements can be used to describe their child’s social experiences on a 5-point scale (1 = Never True, 5 = Almost Always True). For this study, the internal consistency was good to very good for the relational victimisation (T1 \( \alpha = .80 \); T2 \( \alpha = .85 \)) and overt victimisation (T1 \( \alpha = .75 \); T2 \( \alpha = .76 \)) scales.
**Children’s Social Behaviour Questionnaire (CSBQ; Crick, 1996).** Bullying behaviour and prosocial behaviour were measured using the parent-report version of the CSBQ. The CSBQ consists of 15 items on three subscales: relational aggression (7 items), overt aggression (4 items) and prosocial behaviour (4 items). Parents indicate the extent to which a number of statements can be used to describe their child’s social behaviour on a 5-point scale (1 = Never True, 5 = Almost Always True). For this study, the internal consistency was adequate to very good for the relational aggression (T1 $\alpha = .68$; T2 $\alpha = .71$), overt aggression (T1 $\alpha = .69$; T2 $\alpha = .66$) and prosocial behaviour (T1 $\alpha = .77$; T2 $\alpha = .86$) scales.

**Child Behaviour Checklist (CBCL; Achenbach & Rescorla, 2001).** The CBCL was used as a measure of psychosocial functioning. It presents items describing 113 problem behaviours in children, and parents are asked to rate the presence of each behaviour over the past 6 months on a 3-point scale (0 = not true, 1 = somewhat or sometimes true, 2 = very often or often true). The CBCL is widely used and has strong evidence for reliability and validity (Achenbach & Rescorla, 2001). Raw scores on the internalising problems and externalising problems scale were used in the current study as measures of internalising symptoms and externalising behaviours, respectively.

**Procedure**

This study was approved by our University’s ethics committee. Parents and children were provided with an information sheet, and parental written consent and child assent was obtained. Parents were asked to complete a range of questionnaires measuring their child’s psychosocial functioning, including the CSVQ, SEQ, CSBQ and CBCL, as well as the demographics questionnaire. A follow-up assessment, using the same procedure, was conducted 1 year later.
Results

Examination of the distribution of scores indicated that normality was achieved for all variables, apart from overt victimisation and overt bullying, which demonstrated high levels of skewness (i.e., all skewness > 2; Curran, West, & Finch, 1996) and limited variability, and were subsequently classified into dichotomous variables. For overt victimisation, children who were rated by their parents as not having experienced any overt bullying in the past 6 months were classified into a “not bullied” category (46.7% of participants at Time 1; 60.9% of participants at Time 2) with all other participants classified into a “bullied” category. Likewise, for overt bullying behaviour, children who were rated by their parents as not having participated in any overt bullying in the past 6 months were classified into a “no bullying behaviour” category (73.9% of participants; 75.0% of participants at Time 2) with all other participants classified in a “bullying behaviour” category. Screening of the other variables revealed only a small number of outliers (|z| ≥ 3; Kline, 2005) (1.1% of cases at Time 1; 0.7% of cases at Time 2), and so, all data were retained for final analysis\(^1\) (Cohen, Cohen, West, & Aiken, 2003). Descriptive statistics for social vulnerability, peer victimisation, bullying behaviour and the psychological adjustment variables at Time 1 and Time 2, as well as stability coefficients between the time points, are presented in Table 5.1.

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\(^1\) These cases were deemed to be valid given the nature of the data (Meyers, Gamst & Guarino, 2013). In addition, analyses were conducted using both the original data and data when the value of the outliers were winsorised (i.e., absolute value was 3 standard deviations from the mean; Sheskin, 2003), and indicated the same pattern of results.
Table 5.1

*Descriptive statistics and comparison of Time 1 with Time 2 measures for social vulnerability, peer interactions and psychological adjustment (n = 92).*

<table>
<thead>
<tr>
<th>Variable</th>
<th>Time 1</th>
<th></th>
<th>Time 2</th>
<th></th>
<th>t (91)</th>
<th>Stability coefficients</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
<td>M</td>
<td>SD</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social vulnerability</td>
<td>9.10</td>
<td>5.64</td>
<td>6.83</td>
<td>5.44</td>
<td>4.14***</td>
<td>r = .55***</td>
</tr>
<tr>
<td>Relational victimisation</td>
<td>9.38</td>
<td>3.74</td>
<td>9.13</td>
<td>3.93</td>
<td>.64</td>
<td>r = .52***</td>
</tr>
<tr>
<td>Overt victimisation</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>Φ = .53***</td>
</tr>
<tr>
<td>Relational bullying behaviour</td>
<td>10.19</td>
<td>2.91</td>
<td>9.60</td>
<td>2.82</td>
<td>1.91</td>
<td>r = .46***</td>
</tr>
<tr>
<td>Overt bullying behaviour</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>Φ = .34**</td>
</tr>
<tr>
<td>Prosocial behaviour</td>
<td>16.83</td>
<td>2.91</td>
<td>17.22</td>
<td>2.85</td>
<td>-1.29</td>
<td>r = .49***</td>
</tr>
<tr>
<td>Internalising symptoms</td>
<td>6.42</td>
<td>5.23</td>
<td>6.27</td>
<td>5.71</td>
<td>.27</td>
<td>r = .53***</td>
</tr>
<tr>
<td>Externalising behaviours</td>
<td>6.42</td>
<td>5.21</td>
<td>5.73</td>
<td>5.20</td>
<td>1.49</td>
<td>r = .63***</td>
</tr>
</tbody>
</table>

NB: Stability coefficients reported are correlation coefficients (r) or phi coefficients (Φ)

* *p < .05, **p < .01, ***p < .001
Paired samples t-tests were conducted to determine whether there were any significant differences between Time 1 and Time 2 scores (see Table 5.1). Only social vulnerability demonstrated a significant decrease over time; there were no significant differences in scores for any of the other variables. Pearson chi-square analyses were conducted to compare the number of children who experienced overt victimisation or engaged in overt bullying behaviour at each time point. For overt victimisation, there was a significant difference between time points, \( \chi^2 (1) = 25.64, p < .001 \), with more children classified in the “not bullied” category at Time 2. There was also a significant difference between time points for overt bullying behaviour, \( \chi^2 (1) = 10.82, p = .001 \), with more children classified in the “no bullying behaviour” category at Time 2.

Also of note are the substantial stability coefficients between the Time 1 and Time 2 measures, particularly between social vulnerability, relational victimisation, overt victimisation, internalising symptoms and externalising behaviours.

**Preliminary Analyses**

To assess whether demographic variables needed to serve as covariates, relationships between the demographic variables and social vulnerability, peer interactions and psychological adjustment at each time point were explored. An independent samples t-test examined gender (male, female) differences in social vulnerability, relational peer victimisation and bullying behaviour, prosocial behaviours, internalising symptoms and externalising behaviours. There were no main effects of gender for social vulnerability, relational victimisation, relational bullying behaviour, prosocial behaviours, internalising symptoms or externalising behaviours at Time 1 or Time 2 (all \( ps > .05 \)). For overt victimisation, Pearson chi-square tests demonstrated that at Time 1 boys were more likely to be overtly victimised than girls, \( \chi^2 (1) = 9.56, p = .002 \). At Time 2, this difference no longer remained significant (\( p = .057 \)). For overt
bullying behaviour, Pearson chi-square tests demonstrated that there was no difference in between genders at either time point (ps > .05).

An ANOVA examined socioeconomic status (as indicated by family income before tax) differences in social vulnerability, relational victimisation, relational bullying behaviour, prosocial behaviours, internalising symptoms and externalising behaviours. There was no main effect of socioeconomic status for any of the variables at Time 1 or Time 2 (all ps > .05). For overt victimisation and bullying behaviour, Pearson chi-square tests demonstrated that there was no difference in overt victimisation or bullying behaviour between socioeconomic status groups (all ps > .05). Therefore, socioeconomic status was not covaried in any analyses.

Finally, correlations between age and social vulnerability, victimisation, bullying behaviour, prosocial behaviours, internalising symptoms and externalising behaviours at Time 1 and Time 2 were not significant (rs [df = 90] ranged from -0.14 to 0.16, all ps > .05), and thus age was not covaried in any analyses.

**Relationship between Social Vulnerability, Peer Interactions and Psychological Adjustment**

To assess the relationship between social vulnerability and peer interactions (peer victimisation, bullying behaviour, prosocial behaviours), and psychological adjustment (internalising symptoms, externalising behaviours), correlations were conducted. Correlations between measures at each time of testing are displayed in Table 5.2.
Table 5.2

Correlations between social vulnerability, peer interactions and psychological adjustment at Time 1 and Time 2 (n = 92).

<table>
<thead>
<tr>
<th>Variable</th>
<th>1.</th>
<th>2.</th>
<th>3.</th>
<th>4.</th>
<th>5.</th>
<th>6.</th>
<th>7.</th>
<th>8.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Social vulnerability</td>
<td></td>
<td>.42***</td>
<td>.37**</td>
<td>.13</td>
<td>-.02</td>
<td>-.04</td>
<td>.30**</td>
<td>-.06</td>
</tr>
<tr>
<td>2. Relational victimisation</td>
<td>.44**</td>
<td></td>
<td>.43***</td>
<td>.34**</td>
<td>.23*</td>
<td>-.18</td>
<td>.22*</td>
<td>.05</td>
</tr>
<tr>
<td>3. Overt victimisation(^a)</td>
<td>.37***</td>
<td>.52***</td>
<td></td>
<td>.18</td>
<td>.06</td>
<td>-.01</td>
<td>.28**</td>
<td>-.07</td>
</tr>
<tr>
<td>4. Relational bullying behaviour</td>
<td>.21*</td>
<td>.49***</td>
<td>.31**</td>
<td></td>
<td>.36***</td>
<td>-.11</td>
<td>.13</td>
<td>.33**</td>
</tr>
<tr>
<td>5. Overt bullying behaviour(^a)</td>
<td>.29**</td>
<td>.49***</td>
<td>.26*</td>
<td>.59***</td>
<td></td>
<td>-.28**</td>
<td>.09</td>
<td>.22</td>
</tr>
<tr>
<td>6. Prosocial behaviours</td>
<td>-.09</td>
<td>.01</td>
<td>-.02</td>
<td>-.20</td>
<td>-.26*</td>
<td></td>
<td>.14</td>
<td>-.09</td>
</tr>
<tr>
<td>7. Internalising symptoms</td>
<td>.30**</td>
<td>.33**</td>
<td>.28**</td>
<td>.25*</td>
<td>.28**</td>
<td>-.10</td>
<td></td>
<td>.25*</td>
</tr>
<tr>
<td>8. Externalising behaviours</td>
<td>.08</td>
<td>.14</td>
<td>.04</td>
<td>.36***</td>
<td>.24*</td>
<td>-.20</td>
<td>.38***</td>
<td></td>
</tr>
</tbody>
</table>

Note: Correlations at Time 1 are presented above the diagonal. Correlations at Time 2 are presented below the diagonal.

\(^a\) Correlations are point biserial.

\(* p < .05, ** p < .01, *** p < .001\)
Examination of Table 5.2 revealed that the pattern of concurrent correlations were very similar at Time 1 and again at Time 2. Correlations at Time 1 demonstrated that social vulnerability was associated with higher levels of internalising symptoms, but not externalising or prosocial behaviours. Higher social vulnerability scores were also associated with higher levels of relational and overt victimisation, but social vulnerability was not associated with relational or overt bullying behaviour. Similarly at Time 2, correlations demonstrated that higher social vulnerability scores were associated with higher levels of internalising symptoms, but not externalising or prosocial behaviours. Higher social vulnerability scores were also associated with higher levels of relational and overt victimisation. At this time point, social vulnerability was associated with overt and relational bullying behaviour. This finding was somewhat surprising given that this relationship was not evident at Time 1 and has not been demonstrated in past studies (Seward, Ohan, et al., 2016a).

**Follow-up analyses.** Due to the unexpected relationship between social vulnerability and bullying behaviour at Time 2, follow-up analyses were conducted to further explore the nature of this relationship. It was hypothesised that this relationship may be accounted for by the shared variance between victimisation and bullying behaviour, as well as the overlap in risk factors associated with these variables (Cook et al., 2010). Therefore, partial correlations controlling for victimisation, internalising symptoms, externalising behaviours and prosocial behaviours were conducted. Partial correlations demonstrated a non-significant correlation between social vulnerability and relational bullying behaviour ($r (86) = -.04, p = .728$), and social vulnerability and overt bullying behaviour ($r (86) = .17, p = .123$), when these variables were controlled for. As a further check, the relationships between social vulnerability and victimisation were again examined, covarying for bullying behaviour, internalising symptoms, externalising behaviours and prosocial behaviours. Partial correlations demonstrated
that the relationship between social vulnerability and both relational victimisation ($r$(86) = .37, $p < .001$) and overt victimisation ($r$(89) = .28, $p = .009$) remained significant after controlling for these variables.

**Relationship between Social Vulnerability, and Later Peer Interactions and Psychological Adjustment**

To assess the relationship between social vulnerability, and later peer interactions (peer victimisation, bullying behaviour, prosocial behaviours) and psychological adjustment (internalising symptoms, externalising behaviours), bivariate correlations were conducted. These analyses were followed with a series of partial correlations that were designed to evaluate Time 1 social vulnerability as a predictor of subsequent (Time 2) peer interactions and psychological adjustment after controlling for variance due to the relevant Time 1 outcome variable. Results are presented in Table 5.3.
Table 5.3

Correlations between social vulnerability at Time 1 (SV T1) and peer interactions and psychological adjustment at Time 2 (n = 92).

<table>
<thead>
<tr>
<th></th>
<th>RV</th>
<th>OV</th>
<th>RBB</th>
<th>OBB</th>
<th>PB</th>
<th>IS</th>
<th>EB</th>
</tr>
</thead>
<tbody>
<tr>
<td>SV (T1)</td>
<td>.14</td>
<td>.14</td>
<td>.03</td>
<td>.09</td>
<td>-.08</td>
<td>.03</td>
<td>-.06</td>
</tr>
<tr>
<td>SV (T1)</td>
<td>-.10</td>
<td>-.07</td>
<td>-.04</td>
<td>.10</td>
<td>-.06</td>
<td>-.16</td>
<td>-.03</td>
</tr>
</tbody>
</table>

Note: Bivariate correlations are presented on the top row, and partial correlations controlling for the relevant Time 1 outcome (df = 89) are presented on the bottom row.

SV = social vulnerability; RV = relational victimisation; OV = overt victimisation; RBB = relational bullying behaviour; OBB = overt bullying behaviour; PB = prosocial behaviours; IS = internalising symptoms; EB = externalising behaviours

*Correlations are point biserial.

* p < .05, ** p < .01, *** p < .001

The bivariate correlation analyses demonstrated that social vulnerability at Time 1 was not related to relational and overt victimisation, or relational and overt bullying behaviour at Time 2. In addition, social vulnerability at Time 1 was not related to internalising symptoms, externalising behaviours or prosocial behaviours at Time 2.

The same pattern of relationships was evident when the Time 1 outcome variables were controlled for. As social vulnerability was not associated with later peer victimisation, no further regression analyses were conducted.

Discussion

The current study examined the 1 year prospective relations between social vulnerability and psychosocial functioning in children. Of particular interest was whether social vulnerability predicted peer victimisation, internalising symptoms and externalising behaviours 1 year later due to the concurrent associations evident in previous research (Seward, Bayliss, et al., 2016a; Seward, Ohan, et al., 2016a). Results
provided further support for the concurrent association between social vulnerability and psychosocial functioning in children. However, results demonstrated that baseline levels of social vulnerability were not associated with peer interactions or psychological adjustment after 1 year.

At both Time 1 and Time 2, social vulnerability demonstrated moderate associations with relational victimisation, overt victimisation and internalising symptoms, indicating that higher levels of social vulnerability are associated with greater concurrent difficulties in these domains. At both of these time points, social vulnerability was not associated with prosocial behaviours, supporting past research in typically developing children (Seward, Ohan, et al., 2016a). Interestingly however, at Time 2, social vulnerability was associated with bullying behaviour. This finding was somewhat surprising given that such a relationship was not evident at Time 1, or in past research (Seward, Ohan, et al., 2016a). However, further exploratory analyses demonstrated that this relationship was accounted for by the shared covariance with victimisation and the psychosocial adjustment variables. This indicates that, unlike peer victimisation, bullying behaviour does not demonstrate a robust association with social vulnerability.

Despite the cross-sectional associations, baseline levels of social vulnerability were not related to peer victimisation (relational or overt) or internalising symptoms 1 year later, even after controlling for the relevant Time 1 outcome variables. Therefore, the results from the longitudinal analyses demonstrate that whilst concurrent associations may be apparent, baseline levels of social vulnerability do not predict later peer victimisation or internalising symptoms. This suggests that social vulnerability is not important for predicting future risk of psychological maladjustment or victimisation. Rather, it appears that it is a child’s level of social vulnerability at a particular point in time that is important for understanding the concurrent risk of experiencing
victimisation and psychological maladjustment, whereby children who are higher in social vulnerability are at a greater risk of experiencing peer victimisation and internalising symptoms at that moment in time.

Given the moderate associations between social vulnerability and peer victimisation and internalising symptoms at both time points in the present concurrent data (and in past research; Seward, Bayliss, et al., 2016a; Seward, Ohan, et al., 2016a), as well as theoretical conceptualisations proposing that social vulnerability places children at future risk of negative interpersonal interactions (Greenspan et al., 2001), the lack of longitudinal association was surprising. In an attempt to understand this paradoxical pattern of results, a number of explanations were considered. One explanation for this unexpected result is that it may be attributable to the context-dependent nature of children’s class-based social groups. Whereby, the current peer group or classroom environment that the child is within may account for the relationship between social vulnerability and peer victimisation evident at that point in time, but not across the times points. This would explain the presence of concurrent relationships between social vulnerability and the psychosocial variables, as well as the null longitudinal association. However, this cannot explain the substantial stability coefficients in social vulnerability (and the other social interaction variables) over the two time points. Therefore, a more plausible explanation for this unexpected result is that the variance that is shared between the Time 1 and Time 2 variables (as indicated by the strong stability coefficients) is separate from the variance that is shared between social vulnerability and the psychosocial adjustment variables at each time point (as indicated by the concurrent relations). Consequently, when the cross products are examined (i.e., social vulnerability predicting future peer victimisation and internalising symptoms), there is no such relationship between the variates.
Figure 5.1 is presented to provide further conceptual understanding of this pattern of results using the relationship between social vulnerability and relational victimisation as an example. The figure demonstrates that the variance shared between social vulnerability at Time 1 and Time 2, and relational victimisation at Time 1 and Time 2, differs from the variance shared between social vulnerability and relational victimisation at Time 1 and at Time 2, respectively. As such, there is no longitudinal relation from social vulnerability at Time 1 to relational victimisation at Time 2. In support of this conceptual understanding, the partial correlations between social vulnerability and relational victimisation at Time 1 and Time 2, respectively, controlling for either social vulnerability or relational victimisation at the alternate time point (displayed in Figure 5.1), are similar in magnitude to the bivariate correlations between social vulnerability and relational victimisation that were presented in Table 5.2. This suggests that the relationship between social vulnerability and relational victimisation at each time point is independent of the respective covariates at the alternate time point. For example, the relationship between social vulnerability and relational victimisation at Time 2, is independent of baseline levels of social vulnerability and relational victimisation at Time 1. That is, prior levels of social vulnerability or relational victimisation did not influence the relationship between social vulnerability and relational victimisation at Time 2.
Partial correlations between social vulnerability and relational victimisation controlling for the indicated covariate at the alternate time point

<table>
<thead>
<tr>
<th></th>
<th>Time 1</th>
<th>Time 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Controlling for SV</td>
<td>.30**</td>
<td>.44***</td>
</tr>
<tr>
<td>Controlling for RV</td>
<td>.41***</td>
<td>.34**</td>
</tr>
</tbody>
</table>

Note: df = 89

* p < .05, ** p < .01, *** p < .001

Figure 5.1. Conceptual relationship between social vulnerability and relational victimisation.

It is therefore likely that social vulnerability changed at different rates amongst children over the study period. The significant mean reduction in social vulnerability over time, alongside the high stability coefficient, indicates that most children demonstrated developmental reductions in social vulnerability. However, the presence of moderate cross-sectional relationships between social vulnerability and the psychosocial adjustment variables (victimisation and internalising symptoms) at both time points, but no longitudinal relationship, suggests that some children did not demonstrate these age-related decreases in social vulnerability. That is, if the reductions in social vulnerability were consistent across individuals, then longitudinal relationships should have been evident. For example, children with the highest social vulnerability scores at Time 1 would still demonstrate the highest social vulnerability scores at Time 2, and so, social vulnerability at Time 1 should have shown the same relationships with victimisation across both time points. However, this was not the case.

Instead, it is possible that children go through this developmental change process in social vulnerability at different paces and stages. Whilst some children in the current study may have experienced a large decrease in social vulnerability over the course of a year, others may have demonstrated smaller (or no) reductions. This would
mean that some children, who may not have presented as socially vulnerable at a younger age, would present as socially vulnerable a year later because they failed to develop (in terms of a reduction in social vulnerability) at the same time as their peers. It would then be these children that would be at risk for concurrent psychosocial difficulties. Therefore, given this change process, longitudinal associations between social vulnerability and later psychosocial adjustment are not necessarily apparent. Consequently, while social vulnerability is important for understanding the concurrent risk of experiencing psychological maladjustment or negative peer experiences, being high in social vulnerability does not necessarily predict later problems because the individual may go through a developmental shift in social vulnerability that then decreases risk.

Although there was no longitudinal relationship between social vulnerability and peer victimisation or internalising symptoms, the cross-sectional relationships evident in the current study support past research that has demonstrated associations between social vulnerability and psychosocial difficulties in typically developing children (Seward, Bayliss, et al., 2016a; Seward, Ohan, et al., 2016a) and at-risk populations (Fisher et al., 2012; Sofronoff et al., 2011). Moreover, they provide further support for Greenspan et al.’s (2001) theoretical conceptualisation of social vulnerability, demonstrating that it is a construct that places children at immediate risk of experiencing victimisation. Specifically, being socially vulnerable may be a behavioural vulnerability that indicates to bullies that the child is an easy target, which is then maintained due to a tendency towards credulity and gullibility as the child continues to place them self in situations that involve risk (Seward, Ohan, et al., 2016a). Finally, the findings provide converging support for the suggestion that children who are overly trusting substantively deviate from the norms of the peer group, and therefore, are at an increased risk for experiencing psychosocial difficulties compared to their peers (Betts,
Rotenberg, & Trueman, 2009; Rotenberg, Boulton & Fox, 2005). In regard to social vulnerability, children who display more socially vulnerable behaviours (i.e., credulity and gullibility) than their peers deviate from social norms. These children would display an overly naïve orientation in comparison to their peers and behave in ways consistent with this orientation, such as being easily fooled or manipulated; in line with the suggestion that social vulnerability may be an extreme example of a highly trusting nature that is specific to the social arena (Seward, Ohan, et al., 2016a).

**Limitations**

There are a number of limitations to the current study. Foremost, these analyses would benefit from a larger sample to fully explore different clusters that emerge with respect to changes in social vulnerability over time, as well as the collection of data at multiple time points to model changes in the trajectory of social vulnerability and psychosocial outcomes over time. By exploring change in social vulnerability over time we might be able to get a clearer understanding of the developmental processes that are occurring and how this impacts the risk for future psychosocial adjustment.

Additionally, the initial sample was limited to 6- to 9-year old children, so it may be beneficial to examine a broader age range to ascertain whether the lack of prospective relationships are specific to developmental changes at younger, rather than older, age brackets. It is possible that in older age brackets, developmental reductions in social vulnerability may no longer be evident, and so social vulnerability may therefore be associated with future risk of psychosocial maladjustment.

Finally, the current study was conducted during a time when children experience relatively few changes with respect to their social environment (i.e., children stay in the same school). In the current study, social vulnerability was the only variable to demonstrate developmental reductions over time, with peer interaction difficulties and psychological maladjustment tending to persist from one year to the next. This stability
may have limited the ability of other constructs to account for variance in prediction. Therefore, future studies may benefit from capturing transition periods where more change in these variables is evident. Of particular interest may be the transition from elementary school to secondary school. Researchers have demonstrated that the stability of children experiencing victimisation during this transition period is weak (Schäfer, Korn, Brodbeck, Wolke, & Schulz, 2005), and consequently, this may yield more changes in peer victimisation (or other psychosocial adjustment variables) and enable the investigation into whether social vulnerability is a factor that forecasts changes in these domains.

**Conclusion**

The results from this study support past research by demonstrating that social vulnerability is an important psychosocial construct for understanding peer experiences and psychological adjustment in children. Whilst initial levels of social vulnerability were not associated with later psychosocial functioning, our analyses demonstrated that social vulnerability is important for understanding the concurrent risk of experiencing peer victimisation and internalising difficulties in typically developing children. Consequently, the findings implicate social vulnerability as an important factor in understanding children who may be at risk of experiencing social and emotional difficulties. Therefore, our current theoretical and empirical understanding of individual-level risk factors should be altered to include social vulnerability in order to help identify children who are at immediate risk of peer victimisation and experiencing internalising symptoms.
References


Chapter 6  General Discussion
Social vulnerability is a psychosocial construct associated with a child’s social, emotional and behavioural wellbeing. Despite this, social vulnerability is not captured in current measures of social skills or peer problems. Moreover, there has been a dearth of research on social vulnerability in typically developing children. Thus, the aim of this thesis was to conduct a systematic program of research to enhance our understanding of social vulnerability in children. This included the development of a scale for measuring social vulnerability in typically developing children, an investigation into age-related differences in social vulnerability during childhood, identification of cognitive mechanisms that are associated with social vulnerability, and an exploration into the psychosocial consequences of social vulnerability in children. Accordingly, the study presented in Chapter 2 provided psychometric support for the use of the Children’s Social Vulnerability Questionnaire (CSVQ) in typically developing children, and demonstrated that parents perceive greater levels of social vulnerability in younger than older children, and that social vulnerability is elevated in children with clinical needs. In Chapter 3, the study presented demonstrated that there is a direct relationship between theory of mind and social vulnerability. Lastly, in Chapters 4 and 5, the results indicated that social vulnerability is associated with negative peer interactions and psychological adjustment difficulties in children. These findings and their implications are discussed in more detail in the following sections. Potential methodological limitations, along with suggestions for future research, are discussed as relevant throughout. Finally, the implications of these findings with reference to clinical psychology are discussed.

Measuring Social Vulnerability in Children

To enable the investigation of social vulnerability in typically developing children, the first study of this thesis aimed to develop a reliable and valid parent-report measure of social vulnerability for use with children: the CSVQ. In a large sample of Australian elementary school children, the CSVQ demonstrated strong psychometric
properties, including very good internal consistency, good test re-test reliability and sound inter-rater agreement between parents and teachers. Together, these results indicate that the CSVQ is a reliable measure for assessing perceptions of social vulnerability in typically developing children.

The validity of the CSVQ was demonstrated in samples of both parents and teachers. With respect to the parent-report CSVQ, parent reports of social vulnerability were associated with both internalising and externalising problems in two samples of children. This is consistent with past research in children with Asperger’s syndrome (Sofronoff, Dark, & Stone, 2011), and supports the concurrent validity of the scale. In addition, the weak negative relationship between social vulnerability and prosocial behaviour indicates that being socially vulnerable is not simply having a lack of social skills. This supports Greenspan, Loughlin, and Black’s (2001) suggestion that poor social skills are likely to contribute to, but are not the same thing as, socially vulnerable behaviours, and also demonstrates the discriminant validity of the scale. With respect to teachers’ reports on the CSVQ, the results mirrored the pattern of correlations evident from parents’ ratings, demonstrating a positive relationship between social vulnerability and both internalising symptoms and externalising behaviours, and a negative relationship between social vulnerability and prosocial behaviours. Although, the strength of associations between parent reports and teacher reports differed, particularly for the relationship between social vulnerability and prosocial behaviours, this has been acknowledged within the literature and hypothesised to be attributable to contextual differences (Achenbach, Edelbrock, & Howell, 1987). Therefore, it is not considered to be a major limitation. In sum, there is evidence to support the CSVQ as a valid measure of children’s social vulnerability by both parent and teacher report.

Finally, exploration of the factor structure of parent reports on the CSVQ suggested that, in elementary school-aged children, social vulnerability is best
represented by a single factor. Both an exploratory and confirmatory factor analysis
provided support for a one-factor solution, even though items pertaining to both
credulity and gullibility were included in the development of the scale, and even when a
two-factor solution was forced. This finding differs from past research in other samples
(Pinsker, McFarland, & Stone, 2011; Sofronoff et al., 2011). In older adults with and
without a neurological condition, Pinsker et al. (2011) demonstrated a two-factor
solution that corresponded to gullibility (e.g., “believes things that are clearly untrue”) and
credulity (although this was largely in regard to exploitation in financial situations,
e.g., “persuaded to make large donations”). Likewise, Sofronoff et al. (2011) endorsed a
two-factor solution that generally corresponded to credulity and gullibility in children
with Asperger’s syndrome. However, there were notable deviations in the items
included in these scales, as the first factor (gullibility) contained peer victimisation
items (e.g., “been taunted or insulted by other children to the point of distress”) and the
second factor (credulity) contained both credulity and gullibility items (e.g., “believes
what he/she is told regardless of the source” and “is easily fooled”). Given the
deviations from Greenspan et al.’s (2001) conceptualisation of credulity and gullibility
in this scale, combined with the one-factor solution consistently demonstrated in
Chapter 2, it is questionable as to whether the two-factor solution proposed by
Greenspan et al. (2001) is in fact applicable to typically developing children. It may be
that social vulnerability is a unitary construct in childhood that becomes more complex
and bifurcates into two factors (credulity and gullibility) as individuals develop. Indeed,
such a process has been acknowledged within clinical psychology. Cognitive-behaviour
therapy is an empirically validated therapeutic technique, and is often considered to be
the treatment of choice for many mental health disorders in children and adolescents.
However, it is widely acknowledged that behaviour therapy is a more developmentally
appropriate technique for young children (i.e., younger than 7 years), whom might not
yet have developed an awareness of their own cognitions. However, further research is required to determine whether this is the case for social vulnerability.

Together, the results presented in Chapter 2 demonstrated that the CSVQ is a psychometrically sound parent-report instrument for measuring social vulnerability in typically developing children. They also provide promising support for the use of the CSVQ with teachers, however further investigation into the factor structure and reliability (e.g., test-retest reliability) of the CSVQ in this population is needed.

Regardless, the CSVQ provides both parents and teachers with a brief, easy to complete tool to assess social vulnerability in children, which, until now, has been an under researched facet of children’s social interactions. Moreover, the results provide some indication that social vulnerability is a distinct psychosocial construct that has the potential to inform us on children’s social, emotional and behavioural functioning.

**Cognitive Mechanisms Underlying Social Vulnerability**

The study presented in Chapter 3 investigated the cognitive mechanisms associated with social vulnerability in typically developing children. Specifically, the contributions of theory of mind, executive functioning and language ability to the prediction of individual differences in parent-reported social vulnerability on the CSVQ were tested. Correlational analyses indicated that social vulnerability is associated with language comprehension and theory of mind, but not executive functioning. A path analysis identified that theory of mind fully mediated the relationship of executive functioning and language ability with social vulnerability. Higher levels of executive functioning and language ability were associated with higher levels of theory of mind, which in turn was associated with lower levels of social vulnerability.

These results indicate that theory of mind is important for understanding social vulnerability. This supports theoretical conceptualisations of social vulnerability that suggest that social intelligence may be a cognitive mechanism that underlies gullibility.
(Greenspan et al., 2001), and in particular, that deficits in theory of mind skills may be associated with socially vulnerable behaviours (Sofronoff et al., 2011). Sofronoff et al. (2011) proposed that a poorly developed theory of mind (i.e., having difficulty understanding that another’s thoughts or intentions may be different from one’s own) diminishes a child’s ability to detect social cues that indicate deceitful ideas, which would then place them at risk of being exploited. Moreover, the results from the current study support the critical stance literature that demonstrates that social cognition is associated with the ability to detect deceit (Mills & Elashi, 2014; Vanderbilt, Liu, & Heyman, 2011). As such, this research suggests that theory of mind is an important mechanism for understanding the intent of an individual, and in subsequently using that understanding to avoid negative interpersonal interactions.

Interestingly, general intelligence was not associated with social vulnerability. Greenspan et al. (2001) posited that for individuals with developmental disabilities, impaired intellectual functioning may limit the ability to evaluate false claims, and consequently contribute to socially vulnerable behaviours. The current pattern of results does not provide support for this hypothesis in typically developing children. However, it is possible that such a relationship may be applicable for individuals with impaired cognitive functioning (which was not the case in the current study), as deficits in general intelligence may impair the ability to detect and evaluate potentially deceptive social interactions. Consequently, further research in such populations is required.

Greenspan et al. (2001) also suggested that it may be more specific aspects of cognition (i.e., general intelligence, social intelligence, communication) and/or personal competency factors (i.e., personality/motivation, physical competence) that contribute to socially vulnerable behaviours. Accordingly, Greenspan et al. (2001) proposed a model using each of these factors to explain vulnerability to exploitation in the face of challenging interpersonal situations. Likewise, Pinsker and McFarland (2010)
demonstrated that a number of personal competency domains, including general intellectual functioning, cognitive functioning (memory and executive abilities), social intelligence and social skills, are associated with social vulnerability in older adults. The findings reported in Chapter 3 present a starting point in extending these explanatory models of social vulnerability to typically developing children. They indicate that, in typically developing children, it is an individual’s ability to understand others’ mental states and the independence of their thoughts and actions which is important to understanding social vulnerability.

However, an important caveat is that the model presented in Chapter 3 only accounted for a small proportion of the variance in social vulnerability, and as such, further investigation into the cognitive mechanisms associated with social vulnerability is needed. One possible avenue for future research is to investigate the contribution of more advanced aspects of theory of mind to social vulnerability. For example, Mills and Elashi (2014) investigated whether interpretive theory of mind, that is, children’s understanding that ambiguous information can be interpreted in different ways (Carpendale & Chandler, 1996), was associated with children’s ability to recognise distorted claims. Results demonstrated a positive association, with more advanced interpretive theory of mind skills related to an increased ability to detect distortion. Also of note, Sher, Koenig, and Rustichini (2014) explored the contribution of children’s strategic theory of mind to social play interactions. Strategic theory of mind refers to the capacity to infer other people’s mental processes and predict their behaviour on the basis of knowledge of their incentives and assumption of their rationality (Sher et al., 2014). It not only involves theory of mind, but also requires recursive thinking (i.e., the ability to use the output of one step of a reasoning process as input to a following step) (Sher et al., 2014). Their results demonstrated that developmental improvements in strategic theory of mind were associated with increasing sophistication in strategic play.
(i.e., anticipating deceptive and competitive moves from another player). With regard to social vulnerability, it may be that the ability to understand others’ incentives and motivation, and to use this understanding to predict their behaviour, is associated with an increased ability to detect and avoid social situations that involve deception or manipulation. Therefore, it is possible that it is these more advanced forms of theory of mind (i.e., interpretive theory of mind and strategic theory of mind) that are important for understanding social vulnerability, and as such, future research is required to investigate whether this is the case.

An alternative explanation for the small proportion of variance in social vulnerability explained in this study is that there may be factors other than cognitive ability that contribute to social vulnerability. Mills (2013) discussed, and provided evidence for, a number of characteristics aside from the cognitive ability of an individual that may be associated with their ability to critically evaluate information. Some of these included their general trust beliefs, attachment style and motivation to evaluate information. Moreover, across the social vulnerability and critical stance literature, it has been suggested that the characteristics of the situation itself are important for understanding vulnerability to manipulation and deception (Greenspan et al., 2001; Mills, 2013). Greenspan et al. (2001) purported that when presented with a potentially challenging situation, such as a coercive or persuasive situation, it is the interaction between the situation and personal competence factors that contribute to successful or unsuccessful adaptation. Similarly, Mills (2013) highlighted that, in addition to the characteristics of the child, the characteristics of the individuals involved in the social interaction and the characteristics of the interaction itself are important in understanding the ability to critically evaluate information. For example, the perceived level of expertise of the informant and the familiarity of both the informant and the situation were some of the many characteristics external to the child that Mills (2013)
suggested might influence a child’s ability to critically evaluate information. Indeed, research has provided support for these suggestions (see Mills, 2013 for a review). For example, it has been demonstrated that young children are more likely to trust a familiar rather than an unfamiliar informant (Corriveau & Harris, 2009), and that children are more likely to trust an in-group member rather than an out-group member (Elashi and Mills, 2014). Finally, the impact of societal and cultural values on children’s ability to critically evaluate information was not considered in the current study. In many cultures and societies, children are encouraged to believe in invisible beings, such as Santa Claus, the tooth fairy, and God. Research indicates that children are more likely to believe in the existence of such invisible beings if their culture endorses the being’s existence (e.g., in Christianity, believing in the existence of God as opposed to ghosts), or if they engage in rituals in support of their existence (e.g., leaving teeth out for the tooth fairy, or receiving gifts from Santa Claus) (see Woolley & Ghossainy, 2013). Interestingly, research has indicated that cultural beliefs have the potential to override potential scepticism regarding the belief of invisible beings (Harris, Pasquini, Duke, Asscher & Pons, 2006). However, at particular developmental stages it is often (but not always) no longer considered appropriate, and therefore individuals are encouraged to outgrow their belief in these invisible beings (e.g., Santa Claus). Consequently, how cultural influences impact children’s ability to critically evaluate social information is not yet known and warrants further research. Overall, this research suggests that there are factors aside from a child’s cognitive ability that may influence his/her ability to evaluate social information.

One limitation of this study was its concurrent design. Whilst it is hypothesised that theory of mind deficits lead to heightened social vulnerability, it is possible that a bi-directional relationship may occur. There is some longitudinal research that provides evidence for a bi-directional relationship between theory of mind and social outcomes.
(Banerjee, Watling, & Caputi, 2011; Razza & Blair, 2009). For example, Razza and Blair (2009) demonstrated that false belief understanding was positively associated with later social competence, and that social competence was positively associated with later false belief understanding. It is thought that theory of mind promotes positive social interactions, and that social interactions stimulate the development of false belief understanding by providing children with opportunities to learn more about the mental states of others (Hughes & Leekam, 2004; Razza & Blair, 2009). It is possible then that a similar process may occur between social vulnerability and theory of mind, whereby children who have difficulties understanding others’ mental states have difficulties understanding the underlying intention in social situations, and also, that children learn from deceptive social interactions that not all individuals share their own mental state. Consequently, a longitudinal research design with multiple time points would be beneficial to further our understanding of the directionality of these relationships.

**Age-Related Changes in Social Vulnerability**

The findings presented in Chapter 2 showed that parents perceived children in younger schooling years as more socially vulnerable than children in older years. Although based on cross-sectional age comparisons, the overall pattern suggests that social vulnerability progressively declines throughout elementary school, supporting the hypothesis that social vulnerability decreases with age (Greenspan et al., 2001). This pattern of results is also consistent with literature that highlights that children’s ability to critically evaluate information improves with age (see Mills, 2013).

There are a number of factors that may account for the age-related decreases in social vulnerability. Greenspan et al. (2001) hypothesised that decreases in social vulnerability with increasing age may be due to both increased social exposure and advances in cognitive development. With regard to increased social exposure during childhood, entry into elementary school is regarded as a key developmental transition
for children (Higgins & Parsons, 1983). Children are given increasing amounts of freedom as they progress through school, and consequently, are required to manage a range of social interactions in an increasingly independent and self-organised manner (Higgins & Parsons, 1983). Therefore, it is likely that they learn through exposure to situations in which social vulnerability may result in negative outcomes. In support of this hypothesis, empirical research has demonstrated the impact that differing social experiences can have on children’s reasoning about the claims of others. Heyman, Fu, and Lee (2007) compared levels of scepticism between children from the USA and children from China, using nationality as a proxy for differences in social experiences (i.e., in the USA there is a greater emphasis on impression management of the self, whereas in China there is greater emphasis on modesty and maintaining group harmony). Their results demonstrated developmental improvements in reasoning ability across both countries (i.e., 10- to 11-year olds performed better than 6- to 7-year olds). Interestingly, the results also indicated that children in China were more sceptical about self-evaluative statements than children in the USA. This demonstrates the impact that socialisation experiences can have on shaping children’s reasoning about the claims of others. Therefore, exposure to social experiences throughout childhood is likely to impact social vulnerability. Specifically, as children are increasingly exposed to situations that involve deception and/or manipulation, it is possible that they learn from their experiences, and consequently, social vulnerability declines.

From a developmental perspective, advances in theory of mind may also account for the age-related differences evident in social vulnerability. It has been documented that theory of mind improves with age across childhood (Peterson, Wellman, & Slaughter, 2012). A common finding within the theory of mind literature is that, at any given age, children whose theory of mind understanding is more advanced also tend to display more advanced social behaviours (e.g., Hughes & Leekam, 2004; Slaughter,
Imuta, Peterson, & Henry, 2015). Given the findings in Chapter 3 that indicate that theory of mind predicts social vulnerability, it is possible that developmental advances in theory of mind might underlie age-related reductions in social vulnerability, whereby, theory of mind enhances children’s ability to navigate social situations and continues to do so as children develop.

However, even though it appears that children begin to outgrow the tendency to be tricked or fooled by their peers as they get older, the cross-sectional nature of this study means that this pattern cannot be confirmed unconditionally. The results from the longitudinal study presented in Chapter 5 do provide some support for this claim, demonstrating that, at least within a small age range, developmental reductions in social vulnerability are evident over time. Additionally, the age range examined in the current study only extended to 11-year old children, and the means presented indicate that by this age a floor in social vulnerability has not yet been reached, so it is unknown how social vulnerability develops as children enter adolescence. As such, a longitudinal study, with an extension of the age brackets captured, is required to verify the suggested developmental trajectory and to provide an indication as to how social vulnerability develops into adolescence.

**Psychosocial Consequences of Social Vulnerability**

A key aim of this thesis was to explore psychosocial consequences associated with social vulnerability. Across the studies presented in Chapter 2, Chapter 4, and Chapter 5, the relationships between social vulnerability and psychosocial adjustment in children were investigated. Results from the cross-sectional studies (Chapter 2, Chapter 4, and Chapter 5) consistently demonstrated that social vulnerability is associated with internalising symptoms and externalising behaviours (albeit this was limited to internalising symptoms in Chapter 5), with greater levels of social vulnerability associated with greater psychological difficulties. Social vulnerability did not however
demonstrate a strong association with prosocial behaviour. As discussed, this finding is consistent with Greenspan et al.’s (2001) suggestion that social vulnerability is an aspect of social functioning that is distinct from social skills. The results from these studies extend findings from past studies that have demonstrated that social vulnerability is associated with psychological maladjustment in individuals with developmental disabilities (Fisher, Moskowitz, & Hodapp, 2012; Sofronoff et al., 2011) to a typically developing sample of children. Moreover, these findings support research that indicates that children who are overly trusting and naïve are subject to greater psychosocial difficulties (Betts, Rotenberg, & Trueman, 2009; Rotenberg, Boulton, & Fox, 2005). Together the results from the three studies presented provide converging support for the suggestion that social vulnerability may be an extreme example of a highly trusting nature that is specific to social interactions, and is therefore associated with psychosocial adjustment difficulties.

Of the many possible psychosocial consequences of social vulnerability, one that was of particular interest in the current research program was the relationship between social vulnerability and peer victimisation. Theoretically, social vulnerability has been linked to victimisation (Greenspan et al., 2001), and empirical research with children with Asperger’s syndrome has provided support for this association (Sofronoff et al., 2011). The studies presented in Chapter 4 and Chapter 5 extended these findings to a sample of typically developing children, indicating that social vulnerability is concurrently associated with both overt and relational peer victimisation, but not bullying behaviour. This supports Greenspan et al.’s (2001) conceptualisation of social vulnerability, suggesting that a tendency to be tricked or fooled by peers is associated with being the target of negative interpersonal experiences, but not being a perpetrator of them. Moreover, in Chapter 4, social vulnerability contributed unique variance to the prediction of peer victimisation. Importantly, social vulnerability contributed more
unique variance to the prediction of relational victimisation and overt victimisation (albeit in boys only) than some of the best known individual-level predictors of victimisation combined (e.g., internalising symptoms, externalising behaviours, prosocial behaviour and self-esteem; Cook, Williams, Guerra, Kim, & Sadek, 2010).

These findings have important empirical and theoretical implications for our understanding of peer victimisation. There has been an abundance of research investigating risk factors that are associated with being bullied (e.g., Cook et al., 2010). Internalising symptoms, externalising behaviours, low self-esteem and poor social skills have consistently been identified as individual-level risk factors for becoming victims of bullying (e.g., Cook et al., 2010; Hawker & Boulton, 2000). Many of these have also been identified as risk factors for engaging in bullying behaviour (Cook et al., 2010).

Results from Chapter 4 and Chapter 5 indicate that this is not the case for social vulnerability, demonstrating that social vulnerability is associated with peer victimisation, but not bullying behaviour. Consequently, it appears that social vulnerability may be a characteristic that distinguishes victims from bullies.

With regard to our current theoretical understanding of victimisation, children who are victimised are purported to display a behavioural vulnerability to perpetrators that increases risk of victimisation (Hodges, Malone, & Perry, 1997). For example, internalising behaviours are suggested to limit children’s abilities to defend themselves against attacks, and therefore signal to perpetrators that they are an easy target (Hodges & Perry, 1999). Similarly, low self-esteem is thought to be associated with peer victimisation because children may feel unworthy to assert their needs or they may be more willing to accept maltreatment, and therefore feel unable to defend themselves during conflict (Egan & Perry, 1998). It may be that social vulnerability is another behavioural vulnerability. Sofronoff et al. (2011) proposed that for children with Asperger’s syndrome, credulity and gullibility may be considered a particular weakness
by their peers, which places them at risk of being taken advantage of. For typically developing children, a similar process might occur, whereby socially vulnerable behaviours act as a clear signal that the child is vulnerable to perpetrators, indicating that the child is an easy target for victimisation. Additionally, children who are credulous and gullible may continually place themselves in situations that involve risk, which, in turn, may maintain victimisation.

An alternative model that has been used to explain risk of victimisation is that children victimise peers who do not display behaviours that are coherent with group norms (Rubin, Bukowski, & Parker, 2006). Within this context, the social norm of a behaviour is believed to influence peers’ acceptance, whereby children who do not display behaviours that are consistent with the group are rejected (Chang, 2004). Thus, withdrawn and aggressive children are victimised because they do not behave in ways that are consistent with group functioning (Rubin et al., 2006). As such, it is possible that behaving in a socially vulnerable manner, whereby children display an overly naïve orientation in comparison to their peers, may also be considered to deviate from group norms. This then places these children at risk of victimisation. This hypothesis is consistent with the findings of Rotenberg et al. (2005) and Betts et al. (2009), who demonstrated that there is a curvilinear relationship between children’s psychosocial adjustment and their trust beliefs, such that children who held trust beliefs that deviated from group norms (i.e., overly trusting or overly cynical) displayed psychological maladjustment (e.g., depression, anxiety, loneliness) and were at an increased risk of experiencing social difficulties (e.g., peer rejection, fewer friendships).

The study reported in Chapter 5 aimed to extend these concurrent findings by examining whether social vulnerability is a precursor to the development of social, emotional and behavioural problems in children. Results demonstrated that baseline levels of social vulnerability were not associated with later peer interactions or
psychological maladjustment. That is, social vulnerability at Time 1 was not associated with peer victimisation and internalising symptoms at Time 2. This finding was surprising given the strong stability coefficients of the variables and the moderate cross-sectional relationships between the variables evident at both time points. This unexpected pattern of results may have occurred because the variance shared between the Time 1 and Time 2 variables (as demonstrated by the stability coefficients) differed from the variance shared between social vulnerability and the psychosocial adjustment variables at each time point. That is, those individuals whose social vulnerability scores were associated across the two time points differed from those individuals whose social vulnerability and psychosocial adjustment scores were related at each time point.

This pattern of results suggests that alongside the developmental reductions that were evident in social vulnerability over the study period, there may have also been individual differences in the rate at which social vulnerability changed amongst individuals. If there were no individual differences in the rate at which social vulnerability changed (i.e., if reductions in social vulnerability were consistent amongst individuals over the study period), then longitudinal relationships should have been evident. For example, those children who were high in social vulnerability at Time 1 would have remained high in social vulnerability at Time 2, and so, their relationship with peer victimisation across the time points would have remained the same. However, this was not demonstrated. Rather, the presence of moderate cross-sectional relationships at both time points, but no longitudinal relationship, suggests that those children who demonstrated the highest level of social vulnerability at Time 1 did not necessarily demonstrate the highest level of social vulnerability at Time 2, and so the relationship between social vulnerability and peer victimisation across the time points differed. Consequently, longitudinal associations between social vulnerability and psychosocial functioning were not apparent.
To further understand the developmental change process that may be occurring, future research would benefit from data collection with a larger sample at more time points, and across a broader age range. This would enable an in-depth exploration into changes in the developmental trajectory of social vulnerability amongst children over time, and how this might impact psychosocial outcomes. Additionally, examining different clusters that emerge within the sample would allow us to explore whether social vulnerability reliably delineates bullies and victims. Importantly though, the strong cross-sectional relationships suggest that being high in social vulnerability at a particular point in time is associated with higher levels of victimisation and internalising symptoms at that same point in time, and therefore, that lower levels of social vulnerability are associated with lower levels of victimisation and internalising symptoms.

In sum, whilst longitudinal associations were not apparent, across the studies presented in Chapter 2, Chapter 4 and Chapter 5 it was consistently demonstrated that a child’s level of social vulnerability at a particular point in time is important for understanding the concurrent risk of experiencing psychosocial maladjustment. Specifically, those children who are higher in social vulnerability are at a greater risk of experiencing psychosocial difficulties, including peer victimisation and internalising symptoms, compared to their peers. Together, these results highlight the importance of social vulnerability to understanding concurrent risk of peer victimisation and internalising symptoms in children.

**Social Vulnerability in Clinical Groups**

Another important finding from the current program of research was that social vulnerability may be an issue for many children with clinical disorders. Most notably, results presented in Chapter 2 demonstrated that a large proportion of children reported to have attention-deficit/hyperactivity disorder (ADHD) or an autism spectrum disorder.
(ASD) were rated by their parents as being more socially vulnerable than what we would expect due to normal variation within the population. Although sample sizes in these analyses were small, the findings were consistent across most clinical groups, and also mirror past findings that individuals with neurological impairments are more socially vulnerable than their typically developing counterparts (e.g., Fisher et al., 2012; Fisher, Moskowitz, & Hodapp, 2013; Pinsker, 2011; Pinsker & McFarland, 2010; Pinsker, Stone, Pachana, & Greenspan, 2006; Sofronoff et al., 2011).

There is a plethora of research highlighting the social difficulties, including peer victimisation, experienced by children with ADHD (e.g., Bagwell, Molina, Pelham, & Hoza, 2001; Hoza, 2007; Hoza et al., 2005; Unnever & Cornell, 2003; Wiener & Mak, 2009) and ASD (e.g., Cappadocia, Weiss, & Pepler, 2012; Rao, Beidel, & Murray, 2008; Rowley et al., 2012; Wainscot, Naylor, Sutcliffe, Tantam, & Williams, 2008). However, only one empirical study has been reported that has considered the possibility that social vulnerability explains part of this increased risk. Specifically, Sofronoff et al. (2011) found that for children with Asperger’s syndrome, social vulnerability is a unique predictor of peer victimisation (Sofronoff et al., 2011). It is also possible that social vulnerability may help explain some of the difficulties evident within other clinical populations, such as in children with ADHD. Investigating this will help to inform us on risk factors for psychosocial difficulties within these clinical populations, such as the higher prevalence of peer victimisation experienced by children with ADHD (e.g., Unnever & Cornell, 2003; Wiener & Mak, 2009).

Moreover, it is important to understand why these clinical groups are elevated in social vulnerability. The findings from Chapter 3 may provide insight, at least with respect to children with autism. Given the finding that lower levels of theory of mind is associated with heightened social vulnerability, it is possible that deficits in theory of mind skills underlie the elevated levels of social vulnerability evident in children with
developmental and/or clinical disorders. Greenspan et al. (2001) originally hypothesised that individuals with developmental disabilities are more socially vulnerable due to impaired cognitive functioning and a lack of social insight; results from Chapter 3 lend some support to this suggestion. Theory of mind impairments have been indicated in individuals with autism (e.g., Baron-Cohen, Jolliffe, Mortimore, & Robertson, 1997), so for these individuals a relationship between social vulnerability and theory of mind seems likely. However, for children with ADHD this relationship seems less clear, as evidence for a theory of mind deficit in this population is limited and mixed (see Uekermann et al., 2010). For individuals with ADHD, it is more plausible that executive functioning deficits may be associated with increased levels of social vulnerability.

Although this relationship was not evident in the sample of typically developing children, research in older adults with neurological impairments has demonstrated that executive functioning deficits are associated with increased levels of social vulnerability (Pinsker & McFarland, 2010). Therefore, it could be the case that executive functioning is associated with social vulnerability amongst individuals who demonstrate deficits in these abilities. Consequently, applying the cognitive model presented in Chapter 3 (which was based on children without ADHD or other disorders) to these populations of children is a necessary next research step in order to increase our understanding of why these clinical populations exhibit heightened levels of social vulnerability in comparison to their typically developing peers.

Although the results from this study provide us with some indication that social vulnerability is an issue for many clinical groups, they should be interpreted with caution. Chapter 2 was not intended to be a clinical study, so many of the samples for the clinical groups are small. Still, examining the smaller samples that were evident within the larger national sample highlighted the potential clinical application of social vulnerability for providing further understanding of the social risk factors associated
with a range of developmental and clinical disorders. Consequently, a more in-depth investigation into social vulnerability within these clinical populations is required, as the attempt to do so here is clearly speculative at present. Of particular interest is exploring the cognitive mechanisms underlying social vulnerability within these populations, as well as an investigation into the psychosocial consequences of social vulnerability in order to see whether social vulnerability is able to help explain some of the social difficulties evident within these populations. If these findings are indicated, they may have important implications for children with developmental and/or clinical disorders, such as the importance of screening for levels of social vulnerability, and the implementation of protective strategies and supervision to reduce the risk of negative interpersonal interactions.

**Implications for Clinical Psychology**

The results from this thesis offer some preliminary recommendations for addressing social vulnerability from a clinical psychology perspective. Foremost, social vulnerability was associated with psychosocial maladjustment, most consistently with peer victimisation and internalising symptoms, in children. Therefore, identifying children who have elevated levels of social vulnerability relative to their peers is of importance, as this will enable the detection of children who might be at risk of experiencing greater levels of psychological maladjustment and peer difficulties. The normative data presented in Chapter 2 allows for the identification of children who display increased socially vulnerable behaviours in comparison to their peers. Using these data, professionals working across education and psychology will be able to reliably assess social vulnerability and identify at-risk children. Many children who experience victimisation report a reluctance to tell others (e.g., parents, teachers) (e.g., Fekkes, Pijpers, & Verloove-Vanhorick, 2005; Oliver & Candappa, 2007). Therefore, assessing social vulnerability will provide professionals and parents with another way of
identifying children who may be experiencing victimisation (or at risk of experiencing victimisation), but have not disclosed this. Identifying at-risk children could enable the implementation of strategies to reduce the occurrence of these behaviours and reduce the risk of negative interpersonal interactions. One such strategy could be the provision of extra supervision to children who display increased levels of social vulnerability as this may assist in reducing risk of immediate negative interpersonal interactions for them.

Moreover, the results have implications for the prevention of bullying. Bullying behaviour and peer victimisation are increasingly becoming societal problems. Not surprisingly then, the issue of bullying is receiving increased attention within education systems (e.g., Olweus & Limber, 2010; Pearce, Cross, Monks, Waters, & Falconer, 2011). Bullying is a social process, operating at multiple ecological levels, including the individual, peers and wider school environment (Hanish & Guerra, 2000b). Therefore, the best practice approach to addressing bullying is considered to be a whole-school approach, targeting bullying at each of these levels (Dake, Price, & Telljohann, 2003; Hanish & Guerra, 2000b; Pearce et al., 2011). However, the effectiveness of such programs has not consistently been demonstrated (Swearer, Espelage, Vaillancourt, & Hymel, 2010; Ttofi & Farrington, 2011). Swearer et al. (2010) suggested that the occasional ineffectiveness of school-wide approaches may be because such programs are designed to reach all students, and are not specifically targeted to those who are involved in bullying. Therefore, at an individual level, it is important to understand potential factors that place children at risk of being victimised (and of being a perpetrator). The results presented in this thesis demonstrate that social vulnerability is associated with being a victim of bullying, but not being a bully. This differs from many of the individual-level risk factors that share associations with both peer victimisation and bullying behaviour (Cook et al., 2010), and is of significance as it indicates that
social vulnerability may be a unique risk factor that enables us to delineate between children who are at risk of being victimised and children who are likely to engage in bullying behaviours. Therefore, targeting social vulnerability in prevention programs will address a risk factor that is associated with victimisation, and not bullying behaviour.

**General Limitations and Recommendations for Future Research**

Across all studies, parents’ reports of social vulnerability and other behaviours were largely relied on. However, parents may not always be present in situations that involve peer interactions, and so, they vary in the degree to which they know about their child’s social functioning. Additionally, using parents as the only reporter about their child’s behaviour has the potential to introduce shared method variance, which may lead to inflated associations between the measures. Future research could employ a multi-informant approach to enhance the robustness of the results. One such approach could be to develop a self-report measure of social vulnerability. However, children have been identified to be poor informants of their own behaviours, with many widely utilised measures of children’s psychosocial functioning relying on alternate informants. For example, the Achenbach System of Empirically Based Assessment does not utilise a self-report instrument until children reach 11 years of age (Achenbach & Rescorla, 2001). Such a problem is thought to be compounded for the content of social vulnerability, whereby a defining feature of social vulnerability is a lack of insight into such behaviours. Rather, further evaluation of the teacher rating form of the CSVQ would be beneficial. Research has demonstrated that children’s behaviours differ across environments (Achenbach et al., 1987). In fact, only small to moderate correlations are reported between parent- and teacher-reports of behaviours (Achenbach et al., 1987), which was also the case for the CSVQ, as reported in Chapter 2. Therefore, it is highly likely that children’s levels of social vulnerability may differ within the school.
environment, particularly when they are in a classroom and engaged in social interactions with same-aged peers, of which parents are not always able to observe. Teachers, on the other hand, are typically exposed to a broad spectrum of children’s social behaviours within this environment. Validating the teacher-report form of the CSVQ will enable a more comprehensive assessment of social vulnerability, allowing for the identification of socially vulnerable children within the school setting and implementation of protective strategies to reduce risk for them.

Additionally, it is possible that the samples in each of the studies may not necessarily be representative of the Australian population. Attempts were undertaken to ensure the representativeness of the samples. For example, in Chapter 2, the sample was recruited from across Australia, incorporating both regional and rural areas. In the remaining chapters, schools of varying socioeconomic status were recruited to participate in the studies. However, the median income bracket reported in each chapter did exceed that of the median weekly income reported in Australia (i.e., $80,704; Australian Bureau of Statistics, 2014). That aside, consistent findings were reported across Chapter 2 and the remaining chapters (which utilised a different sample to Chapter 2). Specifically, the relationship between social vulnerability and psychosocial functioning was demonstrated consistently in Chapter 2, Chapter 4 and Chapter 5. Moreover, many of the findings reported within the current research program were consistent with findings reported in previous empirical research. Therefore, the representativeness of each of the samples is not thought to be a big limitation of the current research program; however, replication of the current series of studies with a more representative population would be beneficial.

Whilst the current program of research demonstrated the potential for social vulnerability to provide us with insight into peer relationships during childhood, the research focused largely on the relations between social vulnerability, and peer
victimisation, bullying and prosocial behaviours. To increase our understanding of the relationship between social vulnerability and peer relationships, future research could aim to examine a broader array of peer experiences. Of interest are children’s friendships and group acceptance (sociometric status), as these are considered to be important domains within peer relationships that contribute to psychosocial development in differing ways (Gifford-Smith & Brownell, 2003; Parker & Asher, 1993). For example, having a close friend has been demonstrated to be a protective factor against peer victimisation (Crawford & Manassis, 2011; Hodges, Boivin, Vitaro, & Bukowski, 1999; Hodges et al., 1997; Kochenderfer & Ladd, 1997). It is hypothesised that children who have few supportive friends to defend themselves may be targeted by bullies because there is less likelihood of retaliation (Hodges et al., 1997). Moreover, experiencing positive peer interactions has been indicated to reduce the impact of victimisation on emotional wellbeing through the development of interpersonal skills that enable victims to cope with bullies and feel less powerless (Prinstein, Boergers, & Vernberg, 2001; Storch & Masia-Warner, 2004). Sociometric status, on the other hand, refers to the extent to which children are accepted and liked by other children (Gifford-Smith & Brownell, 2003). Children are classified into five, mutually exclusive groups of social status: popular, rejected, neglected, controversial and average (Coie & Dodge, 1983, 1988). Not surprisingly, popular children are more likely to demonstrate adaptive psychosocial adjustment, and rejected children are at greatest risk for poor developmental outcomes (see Gifford-Smith & Brownell, 2003 for a review). Research from Rotenberg et al. (2005) provides some indication that children who are socially vulnerable may be at risk for experiencing lower levels of acceptance in comparison to their peers, as they demonstrated that children who were overly trusting or naïve in nature were considered to be lower in social preference and experience higher levels of social exclusion. Therefore, future research into these areas
of peer experiences would be beneficial to broaden our understanding of how social vulnerability may influence peer relationships during childhood.

A final recommendation for future research is to investigate the relationship between social vulnerability and children’s trust beliefs in others. Rotter (1980) argued that trust and gullibility are independent constructs. Whereas trust is defined as a generalised expectancy that others can be relied on, specifically in situations where there is no clear reason not to rely on them, gullibility involves believing another person when there is a clear reason to doubt them. Rotter (1980) reviewed research in adults regarding this relationship and concluded that adults who hold high trust beliefs are no more likely to be gullible than those who hold low trust beliefs. However, this is yet to be investigated in children. Research has however demonstrated that children who hold high trust beliefs in comparison to their peers were at an increased risk of experiencing psychosocial difficulties (Betts et al., 2009; Rotenberg et al., 2005). Rotenberg et al. (2005) suggested that such an overly trusting nature places these children at risk of being betrayed by their peers, which, consequently, leads to psychosocial maladjustment. As has been suggested, it is possible that social vulnerability may be an extreme example of such a highly trusting nature that is specific to social situations. However, research is required to provide further clarification on the association between these two constructs in children. Regardless of these further investigations, the results presented in the current thesis, alongside previous research (Betts et al., 2009; Rotenberg et al., 2005), indicate that a tendency towards a naïve and foolish nature is associated with psychosocial difficulties, and so, should be considered as an important facet of children’s social interactions.

Conclusion

There have been significant gaps in the conceptualisation and assessment of social vulnerability in children. This thesis was the first systematic research program to
investigate social vulnerability in typically developing children. The research presented has extended past theoretical conceptualisations of social vulnerability by developing a reliable measurement tool to assess social vulnerability in children, which enabled the empirical investigation into the underlying cognitive mechanisms and psychosocial consequences of social vulnerability. Accordingly, the results provide an increased understanding of why some children are more socially vulnerable than others, demonstrating that the capacity to understand that the thoughts and feelings of others may differ from one’s own is a key cognitive mechanism underlying social vulnerability. Moreover, results demonstrated that social vulnerability is a psychosocial construct that is distinct from other social behaviours (e.g., it is not merely equivalent to a lack of social skills), and which has the potential to help us understand social, emotional and behavioural difficulties in ways that are not currently captured in measures of social skills. Therefore, applying our understanding of social vulnerability to clinical and educational settings may be beneficial in enabling the identification of at-risk children and the provision of intervention strategies that have the potential to reduce the risk of negative peer interactions for these children.

The results obtained in the current work are the first to empirically evaluate existing theoretical conceptualisations of social vulnerability, and to extend past empirical literature on social vulnerability to a sample of typically developing children. However, the research presented is only a starting point to understanding social vulnerability in children, and consequently paves the way for future research. We now have a reliable and valid measure for assessing social vulnerability in typically developing children, as well as an increased understanding of why some children are more socially vulnerable than others, and greater insight into some of the psychosocial consequences of social vulnerability. Together, the results from this thesis indicate that
social vulnerability is a psychosocial construct that is an important facet of children’s social interactions.
References


Appendix A  The Children’s Social Vulnerability Questionnaire

CSVQ

This questionnaire contains a list of phrases that can be used to describe your child’s behaviour in social situations. Please read each item and then give your answers on the basis of your child’s behaviour over the last 6 months. Please try to answer all of the questions as best you can, even if you are unsure.

Your child’s name: _____________________________  Date: ________________

My child…

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<th></th>
<th>Never or Very Rarely</th>
<th>Sometimes</th>
<th>Very Often or Always</th>
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<tr>
<td>Can be persuaded into doing things that he/she doesn’t want to do or things that will get them into trouble.</td>
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<td>Falls for a trick, even when previously tricked by the same person.</td>
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<td>Believes things that are clearly unbelievable.</td>
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<tr>
<td>Is unaware when other kids are being mean to him/her.</td>
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<tr>
<td>Can be tricked into doing things that others laugh at.</td>
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<tr>
<td>Does things that can be described as “gullible”.</td>
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<tr>
<td>Believes someone even though they have lied to them in the past.</td>
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<tr>
<td>Is easily fooled.</td>
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