Predictors of Children's Classroom Engagement and Educational Resilience across the Preschool-School Transition

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LIST OF ABBREVIATIONS

ADHD	Attention Deficit Hyperactivity Disorder
AEDI	Australian Early Developmental Index
ANOVA	Analysis of Variance
BIC	Schwarz Bayesian Criterion
BRF-R	Behavior Rating Form-Revised
CD	Conduct Disorder
CFI	Comparative Fit Index
CPRS	Child-Parent Relationship Scale
DECS	Department of Education and Children's Services
DFA	Discriminant Function Analysis
ECLS-K	Early Childhood Longitudinal Study - Kindergarten cohort
EFA	Exploratory factor analysis
FILE	Family Inventory of Life Events
GHQ-12	General Health Questionnaire (12-item version)
ISI	Item separation index
LBS/ PLBS	Learning Behaviors Scale/ Preschool Learning Behaviors Scale
LIS-YC	Leuven Involvement Scale for Young Children
LSAC	Longitudinal Study of Australian Children
LTE-Q	List of Threatening Experiences Questionnaire
MANOVA	Multivariate Analysis of Variance
NFI	Normed Fit Index
NICHD	National Institute of Child Health and Development
ODD	Oppositional Defiant Disorder
PSI	Person separation index
RAPS	Rochester Assessment Package for Schools engagement scale
RAPS-R	Rochester Assessment Package for Schools engagement scale - Revised
RCT	Randomised controlled trial
RMSEA	Root Mean Square Error of Approximation
SDQ	Strengths and Difficulties Questionnaire
SES-TV	Self-Efficacy Scale - Teacher Version

SES	Socio-economic status
SLSA	School Liking and School Avoidance Scale
SSRS	Social Skills Rating Scale
STRS	Student-Teacher Relationship Scale
TLI	Tucker-Lewis Index
TRSSA	Teacher Rating Scale of School Adjustment

ABSTRACT

The aim of this thesis was to determine how three key preschool factors - children's relationships with adults, self-concept and mental health problems - predicted their classroom engagement during their first year of school. The preschool-school transition represents a 'window of opportunity' where appropriate intervention efforts may help enhance children's engagement, a critical aspect of adjusting to school. However, a major barrier in developing effective interventions is that little is known regarding the mechanisms by which key factors predict engagement in the early school years. To address this limitation, this thesis tested a social-motivational model which specifies that parent-child and teacher-child relationships indirectly promote children's engagement, by first strengthening their self-concept and mental health. Engagement was also examined from a resilience perspective, conceptualised as 'better than expected' engagement given children's experience of cumulative risk.

Participants were 575 young children recruited from the 27 preschools within one South Australian school district. Data were collected from their parents and teachers across three waves at yearly intervals, using a longitudinal prospective design. In preschool, both parents and preschool teachers completed questionnaires assessing the quality of children's parent-child and teacher-child relationships, self-concept and mental health problems. Parents also reported on several family risk factors (e.g., parental psychological distress and unemployment, single parent households). One year later, teachers rated children's classroom engagement levels in their first year of school. Additionally, a randomly selected sub-sample of children were interviewed and observed regarding their engagement during a normal school day. Finally, in the third study year, teachers reported on children's school progress, disciplinary action, absences and lateness. A range of path analytic techniques were used to test the hypothesised associations between these variables.

Results showed that good quality relationships with parents and teachers during preschool were indirectly associated with children's subsequent classroom engagement,

through their associations with preschool self-concept and mental health problems. With all predictor variables included in the model, only preschool mental health problems was uniquely related to children's engagement. Associations between mental health problems and engagement were similar for boys and girls. However, boys showed significantly higher levels of externalising problems and lower levels of engagement. Similar mediating mechanisms operated in contexts of risk, by predicting children's resilience (i.e., 'better than expected' engagement).

Children's relationships with parents and teachers, and their self-concept and mental health problems are important predictors of their subsequent classroom engagement. These preschool markers could be used to identify groups of children at risk of developing low engagement. Furthermore, interventions that target these factors may boost children's engagement, helping them start school ready and eager to learn. Although these interventions may benefit boys and girls equally, boys may need more intensive support to help them start school on more equal footing with girls. Furthermore, the same intervention efforts may help both high- and low-risk children. Such interventions may disrupt pathways leading to poor engagement among at-risk children, while also equipping other children with the strengths they need to cope with adverse circumstances *before* any such risk is experienced.

DECLARATION

This work contains no material which has been accepted for the award of any other degree or diploma in any university or other tertiary institution and, to the best of my knowledge and belief, contains no material previously published or written by another person, except where due reference has been made in the text.

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1

OVERVIEW

Across the developed world, governments are recognising the importance of early education and care for children's subsequent development throughout their schooling years. This is reflected in recent policy development and funding allocation. For example, as part of his successful US presidential campaign, Barack Obama pledged $10 billion a year to early childhood education programs, including universal voluntary access to free preschool programs for the first time in the US (Bruner, 2009). Similar shifts have recently occurred in Australia after a return to Labor Government in 2007. Kevin Rudd's early childhood education policy allocated $450 million per year to allow all four year olds access to 15 hours of government-funded preschool programs a week, delivered by a university-trained early childhood teacher, for 40 weeks a year (Australian Labor Party, 2007). And since 2004, all children within the UK have been entitled to free universal preschool education from 3 years of age (Department for Children Schools and Families, 2009; UK National Statistics, 2010).

This 'early years' focus reflects mounting evidence that children's experiences in their early years have a profound influence on their later learning and educational outcomes (e.g., Burchinal et al., 2008; Ladd, Birch, & Buhs, 1999; Luo, Hughes, Liew, & Kwok, 2009; Moss & St-Laurent, 2001; NICHD, 2003, 2005a; Verschueren, Buyck, & Marcoen, 2001). And children's level of engagement in structured classroom learning activities during their first school year also has a lasting impact on their entire schooling career (Alexander, Entwisle, & Kabbani, 2001; Luster & McAdoo, 1996). Classroom engagement encompasses important aspects of connecting with learning activities, including concentration, listening to teachers, persistence with difficult activities, approaching tasks enthusiastically, and enjoying challenges (Connell & Wellborn, 1991; Fredricks, Blumenfeld, & Paris, 2004). Yet not all children arrive at school with adequate engagement skills. For example, on average, boys, economically disadvantaged children,

and indigenous children start school with relatively lower engagement levels, which often decrease further with time (e.g., Berthelsen & Walker, 2009; Tach & Farkas, 2006).

Moreover, economic research on intervention programs demonstrates that the greatest returns to society arise from programs that promote children's development beginning in the preschool years (Heckman, 2000). And these preschool programs appear to have their greatest long-term effects through their influence on early social, emotional, and motivational development, including engagement in classroom learning (D. W. Barnett, Bauer, Ehrhardt, Lentz, & Stollar, 1996; Heckman, 2000; Raver, 2002).

Collectively, this research pinpoints engagement in the first year of school as an important target for change. Yet much remains to be discovered about the mechanisms by which preschool factors influence subsequent classroom engagement. Current knowledge is limited for several reasons. To date, few studies have examined engagement during the first year of school. Furthermore, studies have mostly examined engagement as a predictor of later school outcomes, rather than an outcome of preschool factors. Additionally, few studies examine multiple child-level and environment-level preschool predictors of engagement. Finally, no study that examines engagement in the early school years has used the most prevalent process model of engagement among older children, the Self-Systems Process Model of Engagement (Connell, 1990; Connell & Wellborn, 1991).

The broad aim of this thesis was to examine the predictors and processes of children's classroom engagement in the early childhood years. A sample of 575 South Australian young children was followed as they transitioned from preschool into their first year of school. Multiple factors at levels of both the child (self-concept, mental health problems) and the environment (children's relationships within family and preschool environments) were examined as potential predictors of children's engagement in the first school year, and the broader processes through which they work together to influence engagement were examined.

This prospective study assessed these predictor variables in *preschool*, so that by working to improve these factors within preschool intervention programs, service providers can equip children with the skills they need to get off to a strong start at school.

This thesis also examined whether certain preschool factors were equally beneficial for boys and girls, and advantaged and disadvantaged children, to determine whether one universal intervention or several targeted interventions would be more appropriate.

This thesis is comprised of 10 chapters. Chapter 2 provides an overview of past research relevant to this thesis. It identifies the transition to school as a time of great change, challenge, and adaptation for young children. Classroom engagement is discussed as an essential aspect of adjusting to the classroom learning environment, and as an important influence on many subsequent educational outcomes. The Self-Systems Process Model is proposed as a useful framework for explaining how adult-child relationships, self-concept and mental health problems work together to influence engagement. This chapter also discusses engagement from a resilience perspective, by highlighting how these factors may contribute to 'better than expected' engagement under conditions of cumulative family risk.

Chapter 3 details the methodology employed in this thesis. It identifies the recruitment methods for participating children and their parents and teachers, and the proportion of participants retained across the study waves. It also describes the study measures collected from teachers, parents and children, and the data collection procedures across the three study assessments, which spanned preschool to year 1. Chapter 4 describes the characteristics of the 575 participating young children, in terms of demographic factors, the number of risk factors occurring within their family environment, and scores on the main model variables, including relationships with parents and teachers, self-concept, mental health problems, engagement, and several school outcome variables. Where possible, their functioning is compared to that of other relevant samples of young children, to put their functioning into context.

Chapters 5 to 10 present key results for this research. Chapter 5 assesses the psychometric properties of a teacher-reported classroom engagement scale that was developed and validated in this thesis. Analyses within the chapter assess scale dimensionality, and whether scale items, which were originally developed for use in older children, correctly target the engagement levels of young children in their first year of

school. Finally, analyses examined whether scores on the scale were associated with scores on several theoretically-related variables.

In chapter 6, associations between preschool mental health problems and children's classroom engagement in the first year of school are examined, as is the potential role that gender plays in this association.

In chapter 7, broader associations linking mental health problems and engagement are examined, using the Self-Systems Process Model of Engagement. This model describes the processes by which children's relationships with adults, their self-concept and mental health problems in preschool work together to influence their classroom engagement in the first year of school.

Chapters 8 and 9 examine engagement from a resilience perspective. Chapter 8 examines whether the pathways within the Self-Systems Model are also related to children's engagement that is 'better than expected' given the levels of cumulative risk experienced in preschool (consistent with the definition of resilience). Analyses also examined whether the Self-Systems Model applies to this 'better than expected' engagement (or resilience) under both low-risk and high-risk circumstances. Finally, chapter 9 identifies a subgroup of resilient children, and examines their levels of preschool characteristics. This analysis was undertaken to provide a different (i.e., more person-oriented) perspective on the study of resilience.

The final chapter, chapter 10, summarises results from this thesis, and provides an overall summary of findings. Qualifications of these results are reviewed, as are potential opportunities for future research. Finally, the implications for the promotion of children's engagement following the transition to school are considered.

2

INTRODUCTION

2.1 Overview

This chapter provides an overview of the literature relevant to the aim of this thesis - identifying the predictors and processes of children's classroom engagement following the transition to school. The chapter begins by describing the nature of the preschool-school transition, and highlights its importance as a 'window of opportunity' to implement programs designed to give children a successful school start. It also summarises evidence demonstrating that classroom engagement is an integral part of school success, in this first school year and in subsequent years. Research investigating the factors that promote classroom engagement is reviewed. Classroom engagement is then considered from a resilience perspective, by discussing factors that help children show 'better than expected' classroom engagement despite the experience of cumulative risk.

Several related models of engagement and resilience are reviewed. I highlight how these may be integrated into one coherent model that can be used to examine the processes of engagement both generally, and under conditions of cumulative risk. The chapter concludes by presenting the five main aims of this thesis.

2.2 The Preschool to School Transition

Throughout their development, children experience many transitions that involve marked changes in their roles and/or contexts (Bronfenbrenner, 1979). The first universal transition typically experienced by children in Western societies is the transition to formal schooling, which occurs at around 5 years[1]. This represents an exciting and often anxiety-

[1] Age at entry to formal schooling varies by country. It occurs at around 5 years in Australia, New Zealand, the United States, and the United Kingdom, among other countries. This transition may either follow their fifth birthday, or occur at the beginning of the year of their fifth birthday, meaning children actually start school while still aged 4. Additionally, some children are held back either due to time of year effects, or developmental reasons, and may be closer to 6 at the time of school entry. In contrast, many children in Scandinavian countries do not start school until they are 7 years old.

provoking time for children, as it is characterised by great change, challenge, and adaptation, occurring over a relatively short time period.

Children transition to school from several contexts; some children come directly from the home environment, whereas others have also had some childcare experience. However, the majority of Western children now attend preschool settings prior to starting formal schooling (O'Donnell, 2008; Steering Committee for the Review of Government Service Provision, 2008). Thus, the transition process can be conceptualised as beginning in preschool, and extending throughout children's first school year (Ramey & Ramey, 1994; Rimm-Kaufman & Pianta, 2000).

2.2.1 A note on terminology.

Although the transition to school is a universal experience in Western countries, the terms used to describe this transition differ. Although the preschool year immediately prior to formal schooling is sometimes referred to by more specific names (e.g., nursery school), in most countries it is broadly known as preschool, and this term will be used throughout this thesis.

However, the first year of formal schooling is identified by various names in different countries, and even across the states and territories of Australia. In the US and Canada, it is referred to as 'kindergarten'. In England, it is called 'reception'. As each Australian State and Territory has its own school education system, various names are used for the first school year. These include 'kindergarten' in New South Wales and the Australian Capital Territory, 'transition' in the Northern Territory, 'pre-primary' in Western Australia, and 'preparatory' in Victoria, Queensland and Tasmania. And in South Australia, where this thesis was conducted, the first year of school is referred to as 'reception' (Harrison & Ungerer, 2005; Press & Hayes, 2000).

For the purpose of this chapter, the word 'kindergarten' will be used when broadly referring to the first school year. This is because most of the research conducted on this school year, some of which I discuss in this literature review, originates from the US. However, when specifically referring to the sample of South Australian children participating in the research described in subsequent chapters, the term 'reception' will be

used. This is to differentiate previous research within the literature from the research I conducted, while also striving to be as precise as possible in regards to the current research. It also serves as a reminder that schooling systems differ in various other ways, and thus findings generated from this thesis may not be entirely generalisable to children who experience different school practices.

The names of higher school year levels are much more similar, generally sharing a common number (e.g., year 1, first grade). This makes it much easier to synthesise literature from different countries. Thus, these schooling year levels will be referred to using their original names.

2.2.2 Changes characterising the transition period.

When children move from preschool into school, they enter a very different learning environment, and experience substantive qualitative changes to their roles, responsibilities and relationships (Alexander, Entwisle, Blyth, & McAdoo, 1988; Belsky & MacKinnon, 1994; Ladd, 1996; K. E. Perry & Weinstein, 1998; Rimm-Kaufman & Pianta, 2000). First, school involves longer hours away from home. Children are not only expected to attend school for five full days a week[2], but also to be alert and active during this time. Second, children must form new relationships with peers and school staff, and develop more sophisticated interpersonal skills (Ladd, 1996). Typically, children have only one teacher with whom they can form a supportive relationship. As a consequence, children may receive less one-on-one adult support, and experience greater competition for their teacher's attention (Ladd, 1996). Third, greater demands are placed on children's attention and behaviour, and children are expected to show appropriate classroom behaviour, concentrate for extended periods of time, work independently, and follow classroom routines (Rimm-Kaufman & Pianta, 2000). Fourth, children spend most of their time on structured academic work, and less time in semi- or un-structured play activities. From this first year, children's performance is evaluated with respect to their peers, making schooling a competitive experience (Alexander et al., 1988; Ladd, 1996). As the

[2] Australian children attend for full days in their first school year (from approximately 8.45am to 3.15pm in South Australia); however, this is not the case for all countries. For example, within the United States, some kindergartens only have half-day attendance.

nature of the academic curriculum is cumulative, children need to master the basic literacy and numeracy skills taught during this first year before they can progress to both higher levels of instruction, and higher school levels (Alexander et al., 1988).

Coinciding with these environmental changes, children experience profound changes in their cognitive abilities. At around 5-7 years, rapid cognitive growth leads to an increased capacity for sustained attention, memory, logical reasoning, problem-solving strategies, and regulation of emotions and behaviour (Sameroff & Haith, 1996). Children's thinking becomes less egocentric and appearance-based, and they are able to simultaneously consider multiple aspects of situations and objects (Sameroff & Haith, 1996). In cognitive-developmental theory, these changes are described as a shift from preoperational to concrete operational modes of thought (Piaget & Inhelder, 1969). Importantly, the timing of this shift differs for each child, and is influenced by factors such as the home environment and prior learning experiences (Sameroff & McDonough, 1994). For this reason, children show great variation in cognitive, attentional and social-emotional abilities during the first year of school (Centre for Community Child Health and Telethon Institute for Child Health Research, 2009; Cunha, Heckman, Lochner, & Masterov, 2006; National Center for Education Statistics, 2000; Shonkoff & Phillips, 2000; Wake et al., 2008).

2.2.3 Individual differences in adjusting to school.

Adapting to the many challenges that accompany the first year of school is a key developmental task for children. While most children handle the transition well, a significant minority experience adjustment problems. In a large and nationally representative survey, 3595 US kindergarten teachers reported that 16% of kindergarten children experienced difficult school transitions (Rimm-Kaufman, Pianta, & Cox, 2000). Over one-third of the teachers reported that 'half the class or more' had entered school with adjustment problems, in areas such as attention, social skills and communication, following directions, and working independently.

More recently, Australian kindergarten teachers were surveyed regarding the developmental competencies of over 261,000 5-year-olds during their first school year

(Centre for Community Child Health and Telethon Institute for Child Health Research, 2009). Though teachers considered the majority of children to be adapting well to the school environment, 22% were assessed as showing good adaptation only 'sometimes' at best. Closely paralleling the teachers' opinions, 23% of the children were classified as 'developmentally vulnerable' on the teacher-completed Australian Early Developmental Index (AEDI), on the basis of scoring in the lowest 10% on at least one of the five broad AEDI competencies domains (Centre for Community Child Health and Telethon Institute for Child Health Research, 2009).

These results support the theory that due to the vast individual differences in young children's development, not all children may arrive at school with the ability to adapt successfully to a structured learning environment (Sameroff & McDonough, 1994). However, with only one classroom teacher, neither time nor resources allow for teaching to be tailored to every child's individual developmental level. So whilst some children need greater and more individualised support in their first year, they may not receive it at the level they need (Centre for Community Child Health and Telethon Institute for Child Health Research, 2009; Sameroff & McDonough, 1994).

2.2.4 Relevance of the transition period to longer-term outcomes.

It is especially concerning that a number of children experience problems in adjusting to school, given the implications of their transition experience for future schooling success. A large body of research has illustrated that the relative success of the preschool-school transition influences children's social-emotional and academic outcomes not only during this first year, but throughout their schooling careers (Alexander et al., 1988; Alexander et al., 2001; Belsky & MacKinnon, 1994; Hamre & Pianta, 2001; Ladd, 1990; Ladd & Dinella, 2009; Luster & McAdoo, 1996; Raver, 2002). As children are exposed to many new influences within this period of upheaval, minor adjustment problems can have disproportionate effects on children's schooling trajectories (Pianta & Walsh, 1996). These problems can have cumulative effects, as initial issues often become exacerbated and consolidated, and have flow-on effects in other areas (Finn, 1989; Ladd,

1990). For these reasons, Alexander and Entwisle (1989) have described this transition as a "critical period" for children's development.

However, in this first school year, children's attitudes and beliefs regarding how they feel about school, and how they see themselves as learners are still developing in response to their new learning environment (Pianta & Cox, 1999). Erikson (1968) considered that developing a sense of competence and industry in their new role of 'student' was children's central developmental task upon starting school. In fact, children's academic and social-behavioural outcomes have shown only low to moderate stability between the preschool and early school years within a meta-analysis of 70 longitudinal studies, suggesting that these skills and abilities are still developing, and are therefore malleable (La Paro & Pianta, 2000). At this age, factors other than the children's skills (such as home and preschool experiences) explained the majority of variance in their early academic and social-emotional performance (La Paro & Pianta, 2000).

Combined, these results suggest that children's experiences of how they are supported through this transition period are likely to play a great influence in the development of their school-related attitudes, adjustment, and success. Over time, children's early attitudes and beliefs stabilise, and "become the lenses through which children interpret subsequent school experiences" (Valeski & Stipek, 2001, p. 1199). This may partly explain why children's behavioural and academic trajectories remain remarkably stable from third grade onwards (Alexander et al., 1988).

2.2.5 The potential for preschool interventions to improve long-term outcomes.

The transition to school is not only a critical period in children's lives, but also a 'window of opportunity' when appropriate support and intervention efforts may help children achieve a good start, and steer them onto positive schooling trajectories (Reynolds, Magnuson, & Ou, 2006; Seidman & French, 2004). Intervention programs that begin in preschool, at the very start of this transition period, may reduce existing problems, and inoculate children against issues they may face during the school transition (Ladd, 1996). Preventing problems prior to the start of school may reduce the risk for

developing a negative reputation among teachers or peers once children commence school (Arnold et al., 2006). An extensive body of research has demonstrated that the brain's capacity for change is greatest in the preschool years, and decreases with age (Fox, Levitt, & Nelson, 2010; Shonkoff, 2009). The corollary of this is that interventions are likely to be the most effective during this time, while the brain is still the most flexible and receptive. This is reflected in the work of economist and Nobel Laureate James Heckman, who demonstrated that for every dollar spent on intervention programs, the greatest return in human capital occurred during the early childhood years (Heckman, 2000). From this, he concluded that "As a society, we cannot afford to postpone investing in children until they become adults, nor can we wait until they reach school age - a time when it may be too late to intervene" (Heckman, 2000, p. 5).

Preschools are ideal settings in which to implement early interventions, for several reasons. First, for many children, preschools are their first experience in an out-of-home setting that fosters the acquisition of new skills and a desire for learning (Palermo, Hanish, Martin, Fabes, & Reiser, 2007). Second, most children attend preschool in the year prior to formal schooling (O'Donnell, 2008; Steering Committee for the Review of Government Service Provision, 2008). Thus, preschools may represent the first point during the early childhood years when programs and services can reach the majority of young children. Third, preschool teachers have the potential to identify adjustment problems in children not taken to other services by their parents (Arnold et al., 2006). Fourth, preschools already prioritise the fostering of children's social, emotional, and behavioural competence, and school-related skills, such as sitting still and listening (Arnold et al., 2006; W. S. Barnett, Lamy, & Jung, 2005; Raver, 2002). Finally, preschools have higher teacher-child ratios than schools, and so children can receive more intensive individual attention and support from their preschool teachers (Alexander et al., 1988).

Several studies have highlighted the long-term benefits that can result from well-designed preschool interventions. Notable among these is the Perry Preschool Project, which provided high-quality preschool education to 58 high-risk African American children, and compared their outcomes to those of 65 comparison group children (who

did not receive the program) up to four decades later. The 2-year preschool program was based on Piaget's principles of active child-directed learning, with teachers encouraging children's problem-solving, decision making and initiative in a resource-rich environment. Weekly home visits also enabled parents to reinforce program content (Schweinhart, 2003). Though short-term gains were small, such slight early advantages snowballed into large long-term social and academic benefits for participants. For example, compared with children who did not receive the program, the Perry Preschool participants demonstrated better intellectual and language skills in preschool, higher academic achievement in elementary school, a greater likelihood of completing high school, and higher rates of employment, along with higher income levels, less welfare dependency, and fewer arrests in adulthood (Schweinhart et al., 2005). By the time these participants had reached the age of 27, cost-benefit analyses estimated that for every dollar invested in them, the economic return to society was seven-fold (W. S. Barnett, 1993). At age 40, this return had increased to 16-fold (Schweinhart et al., 2005). The apparent success of the Perry Preschool Project prompted the implementation of other preschool programs, including the Chicago Child-Parent Centers and the Abecedarian Early Child Intervention Program, which have also demonstrated long-term benefits that outweigh initial program costs (as summarised in W. S. Barnett & Ackerman, 2006). These results are promising, and suggest that investing time and resources into children's development during the preschool years is worthwhile.

Two notable limitations of these studies are that not all programs used a completely randomised design, and scores on several baseline variables were not equivalent between the program and comparison groups. Thus, interpreting these results is not straightforward, as it is not certain that these preschool programs were indeed the sole cause of the positive change witnessed (Heckman, Moon, Pinto, Savelyev, & Yavitz, 2009; Raver, 2002). Additionally, as more attention has been paid to program outcomes than processes, the mechanisms by which these benefits were realised are not well understood (Raver, 2002). Indeed, a number of programs implemented since Perry Preschool have produced little to no benefit, showing that it is unclear how best to promote children's school outcomes (W. S. Barnett & Ackerman, 2006; Schweinhart, 2006).

To develop effective preschool programs that foster children's school adjustment, greater empirical information is needed regarding the preschool factors that predict children's transition outcomes (Ladd & Price, 1987; Palermo et al., 2007; Raver, 2002; Rimm-Kaufman & Pianta, 2000). This knowledge would also enable the identification of preschool children who are at greatest risk of poor school adjustment, and who may benefit most from the provision of interventions (Ladd, 1996).

2.2.6 Research investigating school readiness and adjustment.

In the last 20 years, a mounting body of research has investigated children's adjustment outcomes following the transition to formal schooling, which is often referred to as 'school readiness' or 'school adjustment' (Hair, Halle, Terry-Humen, Lavelle, & Calkins, 2006; Kagan, Moore, & Bredekamp, 1995; Ladd, 1996; Meisels, 1999). This research has tended to focus on children's cognitive and academic functioning during their kindergarten year, such as literacy and numeracy skills, and how these relate to children's later schooling outcomes. However, this focus is limited for three reasons. First, it tends to neglect other important 'within child' aspects involved in school adjustment, including physical and motor health and development, language, cognition and general knowledge, social-emotional health, and classroom engagement (Centre for Community Child Health and Telethon Institute for Child Health Research, 2009; Kagan et al., 1995; Ladd, 1996; Meisels, 1999; National Research Council and Institute of Medicine, 2000; K. E. Perry & Weinstein, 1998; Rimm-Kaufman & Pianta, 2000). This is a significant omission, because evidence from intervention programs suggests that non-cognitive factors including social-emotional health and classroom engagement are the most critical for children's later success (Heckman, 2000; Raver, 2002).

Second, this research has largely characterised school adjustment as something intrinsic to children, and has neglected factors from the environments that children transit from and to (Ramey & Ramey, 1994; Rimm-Kaufman & Pianta, 2000). This oversight is concerning, because there is evidence that the level of social-emotional support that children receive during the transition period is critical for their school adjustment (Birch & Ladd, 1997; J. N. Hughes & Kwok, 2007; Murray, Waas, & Murray, 2008; NICHD, 2005a;

Palermo et al., 2007; K. E. Perry, Donohue, & Weinstein, 2007; Pianta, Steinberg, & Rollins, 1995; Smeekens, Riksen-Walraven, & van Bakel, 2008; Stacks & Oshio, 2009). Thus, a more holistic view of children's adjustment to school considers how adults within the home, preschool and school environments can work co-operatively in tailoring environments and supporting children to facilitate smoother transitions (Entwisle & Alexander, 1998; Ladd, 1996; Ramey & Ramey, 1994; Rimm-Kaufman & Pianta, 2000).

Third, the extant research focuses on children during kindergarten, after they have made the transition to school (Ladd, 1996; Palermo et al., 2007). Given the importance of this first school year for later success, more research is needed that examines preschool factors that contribute to school adjustment (Ladd, 1996). There is great value in examining what can be done prior to the transition to help prepare children for this stress and upheaval.

Thus, to advance knowledge on how to give children the best start to school, research on children's early school adjustment needs to broaden its focus to include predictors of social-emotional aspects of adjustment, beginning in the preschool years, and involving the transaction between the child and his/her support system. The following section adopts such an integrated perspective in discussing children's classroom engagement. Several child-level and environment-level predictors of engagement will be reviewed, and processes that connect them will be discussed.

2.3 Classroom Engagement

Classroom engagement (abbreviated to 'engagement' herein) has been defined and measured in different ways (Fredricks et al., 2004; Libbey, 2004; O'Farrell & Morrison, 2003). However, most researchers now agree that engagement is a multidimensional construct (Appleton, Christenson, & Furlong, 2008; Fredricks et al., 2004; Jimerson, Campos, & Greif, 2003). When defined in this way, engagement refers to children's behavioural involvement, emotional commitment, and cognitive investment during classroom learning activities (Connell & Wellborn, 1991; Fredricks et al., 2004). For example, Marks (2000, pp. 154-155) referred to engagement as "a psychological process…specifically, the attention, interest, investment and effort students expend in the

work of learning…. (implying) both affective and behavioral participation in the learning experience". The behavioural component of engagement relates to children's involvement in learning, and includes effort, attention, persistence, participation, and also organisation. Emotional engagement consists of positive (versus negative) feelings about classroom learning, and includes happiness and satisfaction (versus sadness), enthusiasm, enjoyment and interest (versus boredom), anxiety, frustration, anger and pride. Finally, cognitive engagement refers to a psychological connection to learning, and includes intrinsic interest, a preference for challenge, a desire to go beyond requirements, flexibility in problem-solving, coping in the face of failure, self-regulation (using meta-cognition including planning, monitoring and evaluating) and also cognitive effort (i.e., effortful thinking, compared with behavioural effort of getting the work done) (Connell & Wellborn, 1991; Fredricks et al., 2004).

Despite attempts to clarify the construct of engagement, much inconsistency remains within the literature. For example, it is common for researchers to examine only one or two components of engagement, with cognitive engagement being especially neglected (see Fredricks et al., 2004). However, there is value in simultaneously examining children's behavioural, emotional and cognitive learning orientations, given that they are "dynamically interrelated within the individual… [and] not isolated processes" (Fredricks et al., 2004, p. 61). Additionally, many researchers do not distinguish between classroom engagement and the broader construct of engagement with the larger school community. As such, they assess broader indicators including school belonging and participation in extra-curricular activities together with indicators of classroom engagement (Fredricks et al., 2004; Stipek, 2002). This further lack of definitional consistency is problematic, as slightly different constructs are likely to have different predictors and outcomes (Fredricks et al., 2004).

Engagement shares similarities with other constructs such as school liking and connectedness, and motivation (Appleton et al., 2008; Fredricks et al., 2004; Jimerson et al., 2003; Libbey, 2004; O'Farrell & Morrison, 2003). In particular, distinctions between engagement and motivation are often blurred, with many researchers using these terms

interchangeably (Appleton et al., 2008; Fredricks et al., 2004; O'Farrell & Morrison, 2003). Though the two constructs share considerable overlap, there are important differences. Motivation refers to energy, or the internal processes that influence goal-directed behaviour (Kleinginna Jr. & Kleinginna, 1981; Russell, Ainley, & Frydenberg, 2005). However, engagement involves energy in action - the manifestation of underlying motivation (Appleton, Christenson, Kim, & Reschly, 2006; Connell, 1990; Russell et al., 2005). Engagement bridges the pathway between children's motivational processes and their learning and achievement (Furrer & Skinner, 2003; Reeve, Jang, Carrell, Jeon, & Barch, 2004). It is important to make this distinction, for although motivation can be inferred from engagement, a motivated child will not necessarily become engaged, and subsequently achieve (Appleton et al., 2006).

Regardless of the exact definition, classroom engagement is a valuable school outcome in its own right (Finn & Voekl, 1993; Furrer & Skinner, 2003; Shernoff, Csikszentmihalyi, Schneider, & Shernoff, 2003; Willms, 2003). Because children spend the majority of their childhood and teenage years in school, it is important that they enjoy and value the process of learning, rather than simply enduring it (Shernoff et al., 2003). High levels of engagement may validate children's feelings of confidence, optimism, and hope, prevent feelings of loneliness, and foster a sense of school liking and belonging (Goodenow, 1993; Ladd, Kochenderfer, & Coleman, 1997; Schmitz & Skinner, 1993; Skinner, Zimmer-Gembeck, & Connell, 1998; Van Ryzin, Gravely, & Roseth, 2009).

2.3.1 The importance of engagement for a successful school transition.

Engagement in classroom learning is a major developmental task for children in their first year of school (Birch & Ladd, 1997; Masten & Coatsworth, 1998; K. E. Perry & Weinstein, 1998). The National Education Goals Panel in the US identified children's classroom engagement (referred to as 'approaches to learning') as the least researched, and yet perhaps the most important dimension of school readiness (Kagan et al., 1995, p. 21). This view was also reflected in the opinions of kindergarten teachers. A national survey of more than 1300 US public-school teachers found that 76% of the teachers considered being curious and enthusiastic in approaching new activities as 'very important' or

'essential' for children to be ready for kindergarten (Heaviside, Farris, & Carpenter, 1993). Following directions and not disrupting classroom routines were also considered highly important by 60% of the teachers. Teachers rated these engagement skills much more highly than the academic skills of counting and knowing the alphabet, which were ranked as least important (Heaviside et al., 1993). Several smaller studies in the US confirmed these trends (e.g., Hains, Fowler, Schwartz, Kottwitz, & Rosenkoetter, 1989; Harradine & Clifford, 1996; Piotrkowski, Botsko, & Matthews, 2000). Very similar opinions were also found in 162 Australian teachers. For example, from a list of 20 qualities, preschool and kindergarten teachers regarded children's eagerness and ability to follow classroom routines was most important for a successful start to school, whereas academic abilities were least important (Dockett & Perry, 2004). The opinions of teachers are important not only because they provide the most accurate account of what is expected of children within classrooms, but also because teachers' opinions of children's school adjustment influence their schooling trajectories, through decisions regarding ability grouping, referral for special education, and grade retention (Alexander et al., 1988; Pianta et al., 1995). Even the school grades assigned by teachers are related not only to children's academic ability and performance, but also to their behavioural engagement (e.g., Farkas, Grobe, Sheehan, & Shuan, 1990).

However, it appears that teachers expect children to learn and develop these engagement skills during their first school year. For example, Hains and colleagues (1989) asked 28 kindergarten teachers to rate the importance of a list of skills at three time points: at the beginning, middle and end of the kindergarten year. Results showed that few teachers considered any of these skills as 'very important' for the start of kindergarten. However, most teachers regarded following routines, paying attention, participating, independent work, handling corrections appropriately, and asking questions as very important by the end of the kindergarten year. This notion of engagement as a developing skill is also reflected within the South Australian curriculum, where academic standards are not introduced until the end of year 2, and national literacy and numeracy benchmarks begin in year 3 (Department of Education Training and Employment & Department of

Education and Children's Services, 2005). In the first years of school, children are guided towards these achievement goals through the development of engagement and learning-related skills. Broader 'developmental learning outcomes' emphasise 'intellectual and emotional engagement', and relate to confidence, curiosity, creativity and critical thinking within learning (Department of Education Training and Employment & Department of Education and Children's Services, 2005). This issue is summarised by Mosteller, who observed that:

> Some teachers …think of themselves as dealing with a start-up phenomenon. When children first come to school.… Many need training in paying attention, carrying out tasks, and interacting with others in a working situation. In other words…they need to learn to cooperate with others, to learn to learn, and generally to get oriented to being students. (Mosteller, 1995, p. 125)

2.3.2 The relevance of early engagement for long-term schooling outcomes.

Children's engagement in the first school year is also important for their later development, as it has a lasting impact on their educational outcomes. Children's early engagement levels lay the foundations for behavioural, motivational and achievement pathways for the duration of their schooling careers, and beyond. For instance, this longitudinal influence was demonstrated in the Beginning School Study conducted in Baltimore (Alexander et al., 2001). Teacher-ratings of 729 first grade children's behavioural engagement (measured as work-related skills and classroom behaviour) were prospectively associated with high school dropout beginning in ninth grade. This association was almost as strong as that between ninth grade engagement and dropout (Alexander et al., 2001). A similar finding based on 123 children's teacher-reported kindergarten academic motivation scores was reported in the Perry Preschool Project (Luster & McAdoo, 1996). Of the children with academic motivation scores in the bottom third of the sample, only 33% graduated from high school. In contrast, 68% of the children with the highest motivation scores subsequently graduated. Furthermore, the children's kindergarten academic motivation levels were indirectly related to their educational attainment and income at age

27, through their positive influence on eighth grade achievement (Luster & McAdoo, 1996).

Several other educational outcomes are predicted by children's early engagement, including mathematics and reading achievement up until sixth grade, grade retention up until fifth grade, classroom disobedience and disruptiveness in seventh grade, and school absences across the kindergarten year (Alexander, Entwisle, & Dauber, 1993; Claessens, Duncan, & Engel, 2009; Finn & Pannozzo, 2004; Howse, Lange, Farran, & Boyles, 2003; Ladd, Buhs, & Seid, 2000; McClelland, Acock, & Morrison, 2006; J. D. Perry, Guidubaldi, & Kehle, 1979; Reynolds, 1991; Spivack & Cianci, 1987; Valiente, Lemery-Chalfant, Swanson, & Reiser, 2008; Walker & Berthelsen, 2009b; Willson & Hughes, 2009). Such longitudinal associations are not entirely a result of cross-sectional associations between children's kindergarten engagement and their kindergarten achievement. For example, the study by Claessens and colleagues (2009), which followed over 8500 children from the nationally-representative Early Childhood Longitudinal Study - Kindergarten cohort (ECLS-K), conducted in the US, found that children's teacher-rated kindergarten engagement skills predicted fifth grade reading and mathematics skills more strongly than did kindergarten reading abilities, socio-emotional skills, and a number of demographic characteristics. Only children's kindergarten mathematics skills predicted later outcomes more strongly than kindergarten engagement. However, engagement still predicted a significant unique amount of variance in fifth grade outcomes. Similar findings were evident in children from the Longitudinal Study of Australian Children (LSAC: Sanson et al., 2002). Specifically, the teacher-rated kindergarten engagement levels of over 3000 children predicted their third grade literacy and mathematics abilities more strongly than their kindergarten receptive language and perceptual reasoning abilities (Walker & Berthelsen, 2009b).

One explanation for such powerful links is that children's learning experiences in their first school year shape their interpretation of subsequent school experiences. Finn outlines such a process in his participation-identification model of school dropout (Finn, 1989, 1993). Within this model, behavioural engagement in the first school year is

described as essential for children's learning and achievement. Finn argued that most children began school as willing participants, and demonstrate basic behavioural engagement such as participation, listening and responding to the teacher, and completing tasks. If children possess at least some ability, their early engagement results in experiences of achievement and success, which encourages further engagement. Over time and with repeated reinforcing cycles of engagement and achievement, children's engagement becomes habitual, promoting a sense of identification with school, and feelings of belonging and valuing.

However, not all children show optimal behavioural engagement in their first school year. Finn's (1989, 1993) model also describes an opposing process, starting when some children either begin school as non-participators, or instead react to aspects of the classroom with behavioural withdrawal. Low behavioural engagement results in negative outcomes such as low grades, and without experiencing the reinforcing nature of achievement, children do not receive encouragement to continue to engage. If this negative cycle continues, children may not develop a sense of identification with schooling. Instead, with increasing age and autonomy, they may show more extreme forms of withdrawal, such as disruptive behaviour and truancy. Subsequent disciplinary responses such as detention and suspension only alienate students further from school. This negative process of withdrawal can eventually culminate in school dropout. Thus, Finn's model depicts children's engagement during their first school year as the initial mechanism in a gradual process of school identification or, conversely, withdrawal.

Four important implications arise from these 'cyclical' hypotheses. First, any differences in engagement seen between children during their first school year may escalate over time. This effect has been demonstrated in two studies, both of which found that teachers can inadvertently exacerbate differences between differentially engaged students by providing them with different opportunities. Using data from the ECLS-K study, Tach and Farkas (2006) found that 11,769 children's teacher-rated behavioural engagement at school entry (along with initial achievement) influenced their reading group placement by kindergarten teachers, and those placed in higher reading groups then made

greater academic and motivational gains across the year, while children in lower reading groups showed declines. Similarly, Skinner and Belmont (1993) found that initial levels of teacher support were positively related to 144 third through fifth grade students' behavioural engagement, and highly engaged children then received more teacher support. It follows that the teachers' subsequent distancing from disengaged children would then increase their alienation and withdrawal.

A second and related implication is that sub-groups of children who start school with relatively low engagement levels may already be at risk of following negative schooling trajectories. For example, boys consistently show lower levels of engagement than girls (Berthelsen & Walker, 2009; Childs & McKay, 2001; J. N. Hughes, Zhang, & Hill, 2006; Marks, 2000). Similarly, a number of closely related social risk factors including low parental income, educational attainment and occupational status, large family size, living in single parent households, and being of ethnic minority status are all associated with lower engagement levels in children during the first years of school, documented from kindergarten to second grade (Berthelsen & Walker, 2009; Bronson, Tivnan, & Seppanen, 1995; Finn & Pannozzo, 2004; Hair et al., 2006; Ladd et al., 1999; McClelland, Morrison, & Holmes, 2000; Rouse & Fantuzzo, 2009; Tach & Farkas, 2006). These engagement differences are present as soon as schooling begins (Berthelsen & Walker, 2009; Childs & McKay, 2001; Ladd et al., 1999; Tach & Farkas, 2006), and are likely to increase over time. For example, Tach and Farkas (2006) showed that boys and children from lower socio-economic backgrounds (who began school with lower engagement relative to their peers) were subsequent placed into lower reading groups, leading to declines in their engagement by the end of the year. Thus, the existing social stratification of the children was magnified by their initial engagement levels. These groups of children are disadvantaged from the outset, and they need extra support from this first year to keep up with their more advantaged peers.

Third, because of the strong associations between children's engagement and their subsequent learning and achievement, early engagement differences may also widen gaps in achievement over time. Several longitudinal studies conducted in the US have

demonstrated that children's engagement in their first school year positively predicts their *growth* in mathematics and reading achievement across and beyond elementary school, up until the eighth grade (Bodovski & Farkas, 2007; Ladd & Dinella, 2009; McClelland et al., 2006; Tach & Farkas, 2006). All found a compounding effect, where children with lower engagement levels in kindergarten exhibited a lower growth rate over time than did their more engaged peers. The findings of Bodovski and Farkas (2007) are particularly noteworthy, as they found that the positive relation between kindergarten engagement and achievement growth of 13, 043 ECLS-K children from kindergarten to third grade was significantly stronger in children with the lowest initial achievement levels. In other words, it was the children who were low achievers initially who had the most to gain or, conversely, lose.

Finally, these compounding effects may partially explain why children's engagement has consistently been found to decrease across their schooling careers. Engagement levels are higher in the early years of schooling, with consistent and stable declines found from kindergarten to twelfth grade (Eccles, Midgley, & Alder, 1984; Fredricks, Blumenfeld, Friedel, & Paris, 2003; Marks, 2000; McDermott, Mordell, & Stoltzfus, 2001; Tucker et al., 2002; Wigfield, Eccles, Schiefele, Roeser, & Davis-Kean, 2006).

In summary, previous research demonstrates engagement in the first school year is an instrumental part of a successful schooling career. Importantly, engagement has been identified as a key variable by which interventions may exact positive change, and improve achievement and other schooling outcomes (D. W. Barnett et al., 1996; Heckman, 2000). Furthermore, as children's engagement may be at its peak in the first year of school, and may not have yet influenced success (or failure) in other domains, interventions starting prior to this first year may optimise children's early engagement, to ensure they start on successful pathways. However, for any such interventions to be successful, detailed information is needed regarding the factors and processes that are most strongly predictive of young children's classroom engagement in this first school year.

2.3.3 Measurement of early engagement.

A challenge for research investigating engagement in the first year of school is the lack of developmentally appropriate (1) theory describing indicators and dimensions of early engagement, and (2) measurement tools to accurately assess these engagement indicators.

2.3.3.1 Potential developmental differences in engagement.

When considering theories of both engagement and child development, it seems quite likely that the indicators of classroom engagement may differ qualitatively with age (Fredricks et al., 2004). In particular, developmental differences in classroom engagement may occur between the first and later years of schooling. As previously discussed, children undergo a quantitative and qualitative shift in their attentional and cognitive capacities at around 5-7 years of age (see section 2.2.2, also Sameroff & Haith, 1996). Due to such marked developmental changes, some cognitive engagement skills including self-regulation, meta-cognition, strategy use and problem-solving are likely to be still developing in 5-year-old children. Thus, engagement indicators reflecting higher-order cognitive skills may not be appropriate for assessing engagement in young children (Fredricks et al., 2004). This leads to the question: what indicators of engagement are relevant in the early school years? (Fredricks et al., 2004)

This issue is discussed by Finn (1989), who felt that the development of classroom engagement originated in children's very first year of school. According to Finn, children's classroom participation (akin to engagement) became increasingly sophisticated as children matured during their time at school, and thus could be classified hierarchically. In his taxonomy, level-one participation represented the minimum level needed for learning to occur, and was present in most children from their first school year. This basic-level engagement included prototypic behavioural engagement indicators such as paying attention, listening to the teacher, and completing the required work. Only some children were thought to develop higher-level engagement, occurring in response to maturation. This level-two participation involved behaviours reflecting cognitive engagement, including initiative-taking, intrinsic interest, and doing more than required. Thus, Finn's

theory reflects the contention that while behavioural engagement is generally present from an early age, cognitive engagement represents a higher level of engagement, and only develops with maturation.

Furthermore, it is also possible that the dimensionality of engagement may be less differentiated at younger ages. This is certainly the case with the construct of self-concept. Specifically, in the early childhood years spannng preschool and the first years of school, children's self-concept is often found to be quite general and unidimensional (Harter & Pike, 1984; Marsh, Craven, & Debus, 1991; Shavelson, Hubner, & Stanton, 1976). Only with age and increasing cognitive development does self-concept become more complex and multifaceted, breaking off into dimensions such as academic, physical, and relational self-concept (Harter & Pike, 1984; Marsh et al., 1991). In fact, self-concept is considered to become much more differentiated by approximately 8 years – at the age when the dimensionality of young children's engagement has mostly been tested in detail (Connell, 1990; Harter & Pike, 1984). Thus, it seems plausible that prior to this time, engagement is also more general and unidimensional. By considering this 'developmental differentiation' hypothesis in relation to Finn's (1989) theory discussed in the last paragraph, perhaps it is not that cognitive engagement *arises* as a result of maturation, but rather that it becomes *more differentiated* and distinguishable from an initial and more general engagement construct.

These and other possible age and developmental differences in children's behavioural, cognitive and emotional engagement have not been empirically tested. This oversight can be attributed in part to the lack of engagement measures that are both (1) developmentally-appropriate for young children, and (2) comprehensive.

2.3.3.2 Engagement measures designed for young children.

The few engagement measures that are regularly used for kindergarten-age children include developmentally-appropriate items. However, they generally tap predominantly behavioural engagement. Occasionally, some items that are generally thought to assess

cognitive engagement are included within these scales[3] (Alexander et al., 1993; Claessens et al., 2009; Finn & Pannozzo, 2004; Howse et al., 2003; McClelland et al., 2006; McWayne, Fantuzzo, & McDermott, 2004). Specifically, most items reflect attention, organisation, effort, and completing work. As these are not comprehensive engagement measures, studies using them cannot empirically address the question of whether young children's engagement is best represented multi-dimensionally, and using indicators of not only behavioural, but also cognitive and emotional engagement.

As one example, the 'approaches to learning' scale is used in the Early Childhood Longitudinal Study – Kindergarten cohort (ECLS-K), which studied over 17,000 children (National Center for Education Statistics, 2002a, 2002b). This measure is also used by the large and nationally representative Longitudinal Study of Australian Children (LSAC: Sanson et al., 2002). This scale was adapted from a subscale within the Social Skills Rating Scale (SSRS: Gresham & Elliott, 1990). Teachers rate children on 6 items reflecting behavioural (attentiveness, task persistence, and organisation of belongings) and also cognitive engagement (eagerness to learn, learning independence, flexibility), on a 4-point scale (from *never* to *very often*). This measure was intentionally made short for brevity (National Center for Education Statistics, 2002a, 2002b), but, as a consequence, does not allow exploration of the existence of differentiated sub-dimensions.

Additionally, the Learning Behaviors Scale (LBS: McDermott, Green, Francis, & Stott, 1999), and its downwards extension, the Preschool Learning Behaviors Scale (PLBS: Fantuzzo, Perry, & McDermott, 2004; McDermott, Green, Francis, & Scott, 2000; McDermott, Leigh, & Perry, 2002) are used to assess the 'observable behaviours related to classroom learning' of preschool and early elementary school-aged children. Each questionnaire contains 29 items, with 21 of these common to both, though wording differs slightly in the PLBS to reflect the less-structured nature of preschool classrooms. All items have a three-point scale (from *does not apply* to *most often applies*). Although items on these scales reflect both behavioural engagement (e.g., "Is distracted too easily by what is going on in the room, or seeks distractions") and cognitive engagement (e.g., "Is

[3] These early engagement measures are mostly teacher-reported, given that parents do not witness much of children's schooling experiences, and observations and child interviews are time- and resource-intensive.

reluctant to tackle a new task"), each of the subscales include cognitive and behavioural items together. Furthermore, several of the items cross-load on two subscales. Thus, descriptive statistics reported for the subscale and total scores do not provide information as to whether young children are more likely to experience higher levels of behavioural, or of cognitive engagement. While item-level descriptive statistics would be helpful in this regard, they are not provided. The overlap between cognitive and behavioural engagement may also suggest that these dimensions are less differentiated at such a young age.

Finally, the Teacher Rating Scale of School Adjustment (TRSSA: Birch & Ladd, 1997) was developed to assess kindergarten children's 'classroom participation' (consistent with Finn's (1989) conceptualisation of engagement). Though most of the 11 items assess behavioural engagement, all loading on the 'cooperative participation' subscale (i.e., "follows a teacher's direction", "listens carefully to teachers' instructions and directions"), items on the 'independent participation' subscale tap cognitive components (i.e., "seeks challenges", "self-directed child"). A School Liking subscale also assesses children's broad emotions towards school (e.g., "likes to come to school", "has fun at school"), but does not assess how children feel about classroom learning specifically. Detailed psychometric information in the form of item-level means and standard deviations has not been published for this scale, so it cannot be determined whether many children were rated more highly on the few cognitive items.

2.3.3.3 Engagement measures designed for older children.

In contrast to engagement scales designed for younger children, engagement measures for older children often assess multiple dimensions. However, these scales are not always appropriate for use with young children, for several reasons. First, some items that assess higher order cognitive skills may not be applicable to young children, such as strategy use and complex problem-solving (e.g., Appleton et al., 2006; Finn & Rock, 1997; Fredricks et al., 2003; Kong, Wong, & Lam, 2003). Second, other items are not relevant to young children's school experiences. For instance, children in their first year of school rarely (1) skip school, as they do not have this level of autonomy, (2) get disciplined using suspension or detention, as their disengaged behaviours are not yet persistent or severe

enough to warrant such actions, (3) get given homework to complete[4], or (4) have seriously considered their future educational and career goals, and how schooling relates to these (e.g., Finn & Rock, 1997; Lee & Smith, 1993; Manlove, 1998). Any items relating to these behaviours could not be considered representative of young children's engagement. Thus, engagement questionnaires designed for older children would need to be critically examined before using them among young children. Specifically, items should be considered in light of kindergarten children's actual school experiences. Irrelevant items might be best removed, or perhaps revised to apply specifically to activities within kindergarten classrooms. Finally, measures must be pilot tested prior to use, so that their psychometric properties can be evaluated thoroughly, to ensure they are developmentally appropriate.

The most commonly-used measure of engagement in older children is the Rochester Assessment Package for Schools engagement questionnaire (RAPS: Wellborn, 1991; Wellborn & Connell, 1987). This questionnaire was developed to measure the classroom engagement of third to sixth grade children (Connell, 1990; Connell & Wellborn, 1991). Items assess emotional (e.g., interest, happiness, anxiety) behavioural (e.g., effort, attention, participation, persistence), and cognitive (e.g., preference for challenge, flexible problem solving) engagement during classroom activities. Teachers rate items using the stem "In class…" (e.g., "In class, this student does more than required") on a 1 (*not at all true*) to 4 (*very true*) scale. Various versions of the RAPS have been used within published studies. When using the RAPS, researchers have generally selected subsets of items from the full item pool, resulting in slightly different versions, including 10, 16, 30, and even 62 items (Decker, Dona, & Christenson, 2007; Furrer & Skinner, 2003; Kindermann, 1993; Peet, Powell, & O'Donnel, 1997; Skinner & Belmont, 1993; Skinner, Kindermann, & Furrer, 2009; Skinner, Wellborn, & Connell, 1990; Skinner et al., 1998). Furthermore, some researchers combine the emotional and behavioural subscales

[4] This point is perhaps more true of Australian children. Though American and New Zealand children in their first school year are familiar with homework, Australian children are not expected to do homework in their first school year.

into a total score. While these two subscales are always used, the cognitive engagement subscale is not, reflecting a lack of emphasis on cognitive engagement in the literature.

The RAPS has several notable strengths that make it potentially useful to assess engagement in young children. First, it is multi-dimensional, assessing children's behavioural, emotional and cognitive engagement during classroom activities. Second, many items have face validity for use with young children. For example, the cognitive items assess cognitive skills that are typically present among young children, including a preference for challenge and independent work styles (Colman & Thompson, 2002; Stipek, Feiler, Daniels, & Milburn, 1995). Third, the RAPS is psychometrically sound, showing high levels of internal consistency, test-retest reliability, and structural, convergent and criterion validity (Connell, Halpern-Felsher, Clifford, Crichlow, & Usinger, 1995; Connell, Spencer, & Aber, 1994; Decker et al., 2007; Furrer & Skinner, 2003; Furrer, Skinner, Marchand, & Kindermann, 2006; Kindermann, 1993; Peet et al., 1997; Skinner, Furrer, Marchand, & Kindermann, 2008; Skinner & Belmont, 1993; Skinner et al., 2009; Skinner et al., 1990; Skinner et al., 1998; Tucker et al., 2002; Wellborn, 1991). Finally, the RAPS has been used satisfactorily with small numbers of kindergarten and first grade children who were part of larger samples that spanned several grade levels (Decker et al., 2007; Peet et al., 1997; Tucker et al., 2002).

Despite this, it is unclear whether the RAPS can measure young children's engagement validly and reliably. Connell noted that "marked differences exist between…the enterprises in which…children are engaged, and the specific patterns of action thought to reflect engagement" between different developmental periods, including the periods he termed 'infancy' (in the first two years of life), 'early childhood' (from 2-3 years), and 'middle childhood' (the school years) (Connell, 1990, p. 90). However, he did not describe any engagement differences *within* the 'middle childhood' years, and introduced the RAPS engagement scale as applicable to elementary, junior high and high school students across the entire schooling years. Furthermore, as Connell developed and refined the RAPS through research conducted with children in the third grade upwards, items have not been tailored for younger children's everyday classroom experiences (see

Connell & Wellborn, 1991). Several items are less relevant for 5-year-olds (e.g., completing homework, arriving at classes unprepared), and may be less valid as indicators of early engagement. And as the RAPS has not been subjected to psychometric testing among young children, it is not known how often these indicators are seen in young children, and thus if they are characteristic of their engagement.

Despite these limitations, the RAPS appears to be a promising tool for measuring young children's engagement, and may address many of the limitations inherent in engagement questionnaires designed for children in the first years of school. But before it is applied to kindergarten-aged samples, it needs critical evaluation of its psychometric properties in this age group, to ensure that it is developmentally appropriate. Results obtained from such a modified questionnaire could still be compared with those from other studies using the original RAPS, given that these previous studies used slightly different items, and yet yielded largely consonant findings. Furthermore, if the measure proved to be useable in young children, it may then be possible to develop a common questionnaire (or several age-appropriate versions) through further research with samples of varied ages. Having one measure that can effectively capture the engagement of children of all ages would help immensely in synthesising evidence from research across the schooling years.

2.3.4. Predictors of early engagement.

A major barrier in developing preschool interventions that aim to improve children's engagement is that relatively little is known regarding the predictors and processes of engagement in the early school years. Children in their first years of school have been neglected within research on engagement, which mostly focuses on adolescents in middle and high school, and also older elementary school children from the third grade upwards (e.g., Appleton et al., 2006; Connell et al., 1995; Finn & Rock, 1997; Fredricks et al., 2004; H. Patrick, Mantzicopoulos, Samarapungavan, & French, 2008; Skinner et al., 1998). This is especially problematic when considering that children's schooling trajectories show remarkable stability from the third grade onwards (Alexander et al., 1988). Thus, the schooling attitudes and behaviours studied in older students are likely to

be much more resistant to intervention efforts. Only quite recently have researchers moved to address this deficiency by focussing on children in their first year of school.

Consistent with holistic models of school adjustment, I now review several key environment-level and child-level predictors of engagement: children's relationships with their parents and teachers, their self-concept, and their mental health problems (which are also illustrated in Figure 2.1 for clarity). This review is not intended to be exhaustive. Instead, it provides evidence to support the premise that promoting these factors during preschool will lead to gains in children's engagement during the first year of school. Consequently, the discussion will focus on the early years of school and, where possible, studies spanning the transition to school, where preschool variables are used to predict engagement in the first school year. Though the majority of the research into 'early years' engagement has been cross-sectional, attention will be focussed on studies examining longitudinal links where possible.

2.3.4.1 Parent-child relationships.

A growing body of research shows that parents have a significant influence on their children's classroom engagement (illustrated in Panel A of Figure 2.1). This research has generally examined the effects of relationships using attachment theory (Bowlby, 1969/1982). From this perspective, the warmth, responsiveness, closeness and trust from children's 'attachment figures' (i.e., familiar and consistent caregivers, such as parents) is thought to provide children with a secure base from which to explore freely, with the knowledge that they will be supported during times of stress (Bretherton, 1985; Bretherton & Mulholland, 1999; Cassidy, 1999; Weinfield, Sroufe, Egeland, & Carlson, 1999).

From infancy onwards, the type of attachment children have to their parents (e.g., secure, insecure-avoidant, insecure-ambivalent, or insecure-disorganised) is related to their later classroom engagement and school adjustment. In one recent study, small but significant links were found between 111 children's disorganised attachment classification (disorganised, or not) at 15 months, and teacher-ratings of both their classroom engagement and externalising problems at age 5 (Smeekens, Riksen-Walraven, & Van Bakel, 2009). However, children's secure attachment classifications did not significantly

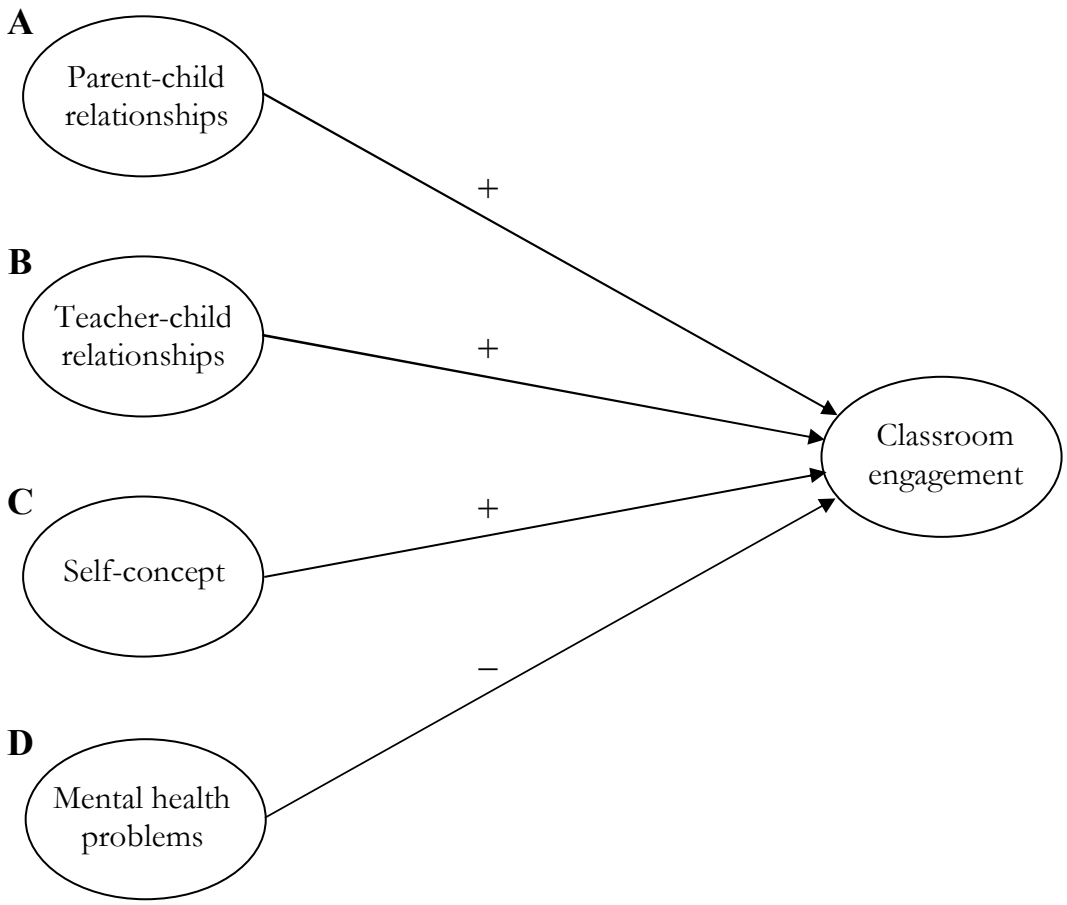


Figure 2.1. Potential predictors of kindergarten children's classroom engagement. Each panel illustrates the sign and direction of the hypothesised bivariate association between one predictor variable and classroom engagement, as based on previous research.

predict their engagement, suggesting that maladaptive attachment patterns may be more strongly related to engagement. This is consistent with previous studies on attachment, given that disorganised attachment has shown stronger associations with concurrent and later psychopathology, and is frequently seen in abused and neglected children (D. Barnett, Ganiban, & Cicchetti, 1999; Cicchetti & Toth, 1995; S. Goldberg, 1997). Finding a significant association four years later is noteworthy, and may reflect the potency of the disorganised attachment classification rather than the apparent lack of power of secure attachment.

Given that children's attachment may change in response to environmental influences, such as changes in parental employment or stress levels, Fish (2004) examined attachment during both infancy and preschool as predictors of the preschool and

kindergarten engagement outcomes of 82 low-income rural children. She found that children with secure attachments in infancy showed higher levels of both observed task persistence in preschool and teacher-rated classroom engagement in kindergarten than did children with insecure attachments. Furthermore, after taking *infant* attachment into account, *preschool* attachment classification was not related to children's subsequent engagement.

Moss and St-Laurent (2001) examined the preschool attachment classifications of 108 6-year-old children. They found that children with secure preschool attachments had higher concurrent cognitive engagement levels during a mother-child problem-solving task at age 6, and higher levels of mastery motivation at age 8, than children with either avoidant or ambivalent attachments.

Additionally, several researchers have studied children's mental representations of their attachment as predictors of their classroom engagement. Young children's attachment representations can be gauged from the attachment themes present in their doll play responses to several narrative vignettes. These studies have generally examined cross-sectional links. Specifically, the level of children's secure attachment representations and their teacher-reported classroom engagement have shown small significant positive links in both preschool (Stacks & Oshio, 2009; Verschueren & Marcoen, 1999) and kindergarten (Sturge-Apple, Davies, Winter, Cummings, & Schermerhorn, 2008) in both high functioning children and in low-income and at-risk children. In fact, security within children's attachment representations fully mediated the link between observed parental emotional unavailability (averaged across mothers and fathers) and classroom behavioural engagement, supporting the premise that children's subjective interpretations of the attachment relationship may be the most direct link to their developmental outcomes. However, the direction of this mediational pathway could not be determined due to the cross-sectional nature of this work.

Bascoe and colleagues' (2009) longitudinal study of 210 children provided support for the hypothesised direction of these effects. After adjusting for socio-economic status, child negative affect, and children's perceptions of the interparental relationship, insecure

representations of the parent-child relationship during first grade significantly predicted decreases in children's teacher-reported classroom behavioural engagement between first and second grade.

Aspects of parenting that promote secure attachment, including warmth, responsiveness, emotional support and availability are also uniquely associated with young children's engagement. Perhaps the strongest evidence for this comes from the National Institute of Child Health and Development (NICHD) study of early child care (NICHD, 2001), a large-scale prospective study. In a random representative sample of over 1000 children, researchers observed mother-child interactions during play and problem-solving tasks on 5 occasions between 6 and 54 months of age (prior to starting school). Levels of maternal sensitivity, which comprised positive regard, absence of hostility and intrusiveness, and support for autonomy, were scored at each assessment. The average level of maternal sensitivity during children's early years showed small significant positive longitudinal associations with children's first grade (1) observed time spent engaged with assigned classroom activities (NICHD, 2003), and (2) teacher-rated positive work habits, including working independently and carefully, completing work, being organised, and following classroom procedures (NICHD, 2005a). More importantly, these significant associations remained after adjusting for numerous socio-demographic, child care, school entry and first grade variables (NICHD, 2003, 2005a).

Observed parent-child interaction quality during preschool has also been associated with several indices of kindergarten school adjustment, in a small sample of African American children at-risk for developmental problems (Pianta, Nimetz, & Bennett, 1997). Specifically, parent-child interactions observed during a problem-solving task that were characterised by higher levels of positive affect and intimacy, and task instruction, and lower levels of control issues were associated with higher levels of engagement (conceptualised as work habits and frustration tolerance), and lower levels of shy/anxious behaviour, as rated by kindergarten teachers.

Similarly, Sturge-Apple and colleagues found that parental emotional availability during kindergarten was a key factor in promoting children's subsequent classroom

engagement and social-emotional adjustment (Sturge-Apple, Davies, & Cummings, 2006). Both mothers' and fathers' levels of warmth, support, and responsiveness were observed during structured parent-child play tasks in a sample of 210 kindergarten children and their parents. Increases in both maternal and paternal emotional unavailability from kindergarten to first grade were related to decreases in children's teacher-reported engagement from first to second grade. However, only increases in *paternal* emotional unavailability predicted increases in children's internalising and externalising behaviours. The fact that parental unavailability was observed during play tasks may partially explain fathers' stronger links to outcomes, given that fathers tend to be children's preferred playmate in Western societies, whereas mothers tend to be children's preferred caregiver and attachment figure (see Bretherton, 1985).

In sum, various aspects of parents' relationships with their children seem to promote children's classroom engagement in the early years, along with many other developmental outcomes. The broad array of parenting aspects that are related to engagement highlights the powerful and pervasive impact of early parenting. However, the majority of this evidence, with the exception of the NICHD studies (NICHD, 2003, 2005a), is from relatively small samples. And while these effects are often small to moderate in size, they are noteworthy as they continue to influence children's development in the school context, where parents are not physically present. Such findings support the premise within attachment theory that children carry internal representations of attachment relationships with them into new and different situations (Bowlby, 1969/1982; Bretherton, 1985; Cassidy, 1999; Weinfield et al., 1999).

2.3.4.2 Teacher-child relationships.

Children form other attachment relationships beyond those with their primary caregivers (Bretherton & Mulholland, 1999; Howes, 1999; Howes, Hamilton, & Matheson, 1994). There is evidence that children's teachers can also act as attachment figures. Consistent with attachment theory, children rely on teachers for support and security during times of stress (Koomen & Hoeksma, 2003; van Ijzendoorn, Sagi, & Lambermon, 1992). Teacher-child relationships are also able to be classified according to attachment

dimensions, through both observation and teacher-rated scales (e.g., Howes & Ritchie, 1999; Pianta & Steinberg, 1992; van Ijzendoorn et al., 1992). Thus, the influence of teacher-child relationships can be examined from an attachment theory perspective. In particular, early childhood studies generally focus on levels of closeness and conflict within the teacher-child relationship, which is often reported by the teachers themselves.

Small to moderate significant associations have consistently been found between teacher-child relationships, both close and conflictual, and children's classroom engagement (illustrated in Panel B of Figure 2.1). Several studies have shown cross-sectional associations in both kindergarten and first grade children (Birch & Ladd, 1997; J. N. Hughes, Luo, Kwok, & Loyd, 2008; J. N. Hughes et al., 2006; Murray, Murray, & Waas, 2008; Murray, Waas et al., 2008). In a longitudinal study by Pianta and colleagues (1997), preschool teachers' ratings of both security and conflict within the teacher-child relationship showed small significant associations with children's behavioural engagement (conceptualised as frustration tolerance and work habits) as rated by their kindergarten teachers. These findings are consistent with those of studies examining longitudinal associations between teacher-child relationships and engagement (1) across both the preschool and the kindergarten year, and (2) between kindergarten and first grade (Ewing & Taylor, 2009; Ladd et al., 1999; Pianta & Nimetz, 1991; Pianta & Steinberg, 1992; Pianta et al., 1995). In several instances, the influence of teacher-child relationships remained significant after adjusting for variables including gender, classroom relational environment, ethnicity, temperament variables, cognitive maturity, and prosocial and antisocial behavioural styles (Birch & Ladd, 1997; Ewing & Taylor, 2009; J. N. Hughes et al., 2006; Ladd et al., 1999). Both closeness and conflict dimensions show unique associations with children's engagement, though conflict emerges as a slightly stronger predictor overall. This is consistent with Ladd and colleagues' (1999) hypothesis that relational stressors have a stronger impact on engagement than relational supports, as they may impede or interrupt opportunities for engagement, instead of simply affecting the intensity or frequency of engagement.

Pianta and colleagues also examined the ability of kindergarten teacher-child relationships to predict change in 413 children's classroom engagement from kindergarten to first grade (Pianta et al., 1995). To do this, standardised residual scores were used to measure the first grade engagement *not* predicted by kindergarten engagement. In this manner, teachers' perceptions of conflict, closeness and dependence within teacher-child relationships were all related to changes in engagement: higher levels of conflict and dependence were associated with 'lower than predicted' engagement, and higher levels of closeness were associated with 'higher than predicted' engagement. Similar effect sizes were also seen for links between teacher-child relationship quality and deviations in children's problem behaviours between kindergarten and first grade.

Other longitudinal studies have also found that teacher-child relationship quality predicts change in children's engagement levels during the early school years. Across both community samples and more targeted at-risk groups, better teacher-child relationship quality in kindergarten and first grade has predicted increases in children's teacher-reported engagement across the following year, even after controlling for aggression and peer acceptance (J. N. Hughes & Kwok, 2006; J. N. Hughes et al., 2008; Ladd & Burgess, 2001). Preschool teacher-child closeness has also predicted the change in both teacher-reported engagement and problem behaviours between kindergarten and second grade (Peisner-Feinberg et al., 2001).

In particular, Hughes and colleagues' (2008) study of 671 academically at-risk children highlights the critical nature of teacher-child relationships in the first years of formal schooling. These researchers found a significantly stronger relation between better teacher-child relationship quality in first grade and increases in teacher-reported engagement across the year, than between better relationship quality in second grade and subsequent increases in engagement levels. Given that only two yearly time spans were examined, it is not known whether similar associations across the preschool-school transition would be even stronger. Such an effect would be consistent with the hypothesis that teacher-child relationships are more important at younger ages, given young children are more dependent on adult authority figures for guidance and emotional support than

are older children and adolescents, due to their unfledged autonomy (Buhrmester & Furman, 1987; Lynch & Cicchetti, 1997).

The impact of early teacher-child relationship quality persists through elementary school and up until the sixth grade. Hamre and Pianta (2001) studied 179 children, and found that negative teacher-child relationships in kindergarten, marked by conflict and dependency, showed significant negative associations with teacher-reported behavioural engagement (referred to as positive work habits) during lower elementary school (first to fourth grade). These associations remained significant after controlling for IQ and behaviour problems in kindergarten, and children's gender. Furthermore, kindergarten teacher-child relationships were indirectly related to engagement in upper elementary school (fifth to sixth grade), through their effects on lower elementary engagement. It is possible that these effects were at least partially mediated through children's relationships with teachers in later grades. However, such a temporally distal effect supports the notion of the early years as a critical period, where first impressions have a large influence throughout children's time at school (Alexander et al., 2001; Pianta & Walsh, 1996).

Given that children may experience similar relationships with different teachers, children who continually experience poor quality relationships are likely to show even worse outcomes. Ladd and Burgess (2001) found that teacher-child relationship history characterised by chronic and high levels of conflict from kindergarten to first grade better predicted declines in 396 children's teacher-reported engagement across the same period than the level of conflict at the beginning of kindergarten. Conversely, 'chronically' high levels of closeness across the kindergarten - first grade period were more strongly related to increases in engagement than was initial relationship closeness.

Teachers' general interaction styles with students as a whole can also predict children's engagement. Children in preschool classrooms characterised by higher levels of emotional, organisational and instructional support experience higher levels of engagement and lower levels of behaviour problems in kindergarten than children in lower-quality classrooms (Burchinal et al., 2008; Curby et al., 2009). When these dimensions of support are analysed separately, effect sizes are generally higher for emotional, rather than

instructional support (Burchinal et al., 2008). This finding supports the premise within attachment theory that warmth, responsiveness and emotional availability are the most critical elements of relationships for fostering a secure base and helping children engage in the learning environment (Bretherton & Mulholland, 1999). However, studies in kindergarten and first grade children suggest that it is still the case that individual teacher-child relationships account for a greater amount of variance over and above the effect of overall classroom climate (Birch & Ladd, 1997; J. N. Hughes et al., 2006).

2.3.4.3 Self-concept.

Attachment theory proposes that self-concept develops in the context of infant-caregiver relationships, as appraisals of the self and the attachment figure are complementary and intertwined (Cassidy, 1999). When children experience consistently warm and responsive care, they come to view themselves as worthy of this support, and as successful at eliciting it (Cassidy, 1999; Connell, 1990). Self-concept continues to develop throughout early childhood. At preschool age, children's self-concepts tend to be overly positive, and as already mentioned, are less differentiated (and often unidimensional) than in later years (Harter, 2006). Moreover, preschool children generally describe themselves using concrete descriptions of behaviours, abilities, and emotions, for example "I can run fast", "My mother is proud of me". Despite these developmental complexities, preschool children have a reasonably well-defined general self-concept, and the variation between their self-concept levels is associated with their developmental outcomes (Marsh et al., 2002; Verschueren, Buyck, & Marcoen, 2001).

Whilst many studies demonstrate significant associations between self-concept and engagement among older children and adolescents (e.g., Connell et al., 1995; Connell et al., 1994; Furrer & Skinner, 2003; Guay & Vallerand, 1997; Liem, Lau, & Nie, 2008; Sharkey, You, & Schnoebelen, 2008; Shonk & Cicchetti, 2001), there appear to be only five studies that assess associations between children's self-concept and engagement in the early school years (illustrated in Panel C of Figure 2.1). Three of these studies examined cross-sectional links between children's self-reported perceived competence and their teacher-rated classroom engagement, in low-income and ethnically diverse kindergarten (n = 225)

and first grade (n = 127) children. Valeski & Stipek (2001) found small positive correlations between first grade children's self-reported perceived competence in mathematics and literacy work and teacher-reported classroom engagement. However, associations in kindergarten children were much smaller, and not statistically significant. Similarly, two studies by Hughes' group (J. N. Hughes & Zhang, 2007; Luo et al., 2009) found small positive correlations between first grade children's self-reported perceived competence and teacher-reported engagement, with the effect sizes similar to those reported for the kindergarten children by Valeski and Stipek (2001). Such small effect sizes are not unusual for associations between child- and teacher-reported variables during early childhood (D. Barnett, Vondra, & Shonk, 1996; Decker et al., 2007; Murray, Murray et al., 2008).

Finally, two studies conducted by Verschueren and colleagues (Verschueren et al., 2001; Verschueren, Marcoen, & Schoefs, 1996) found both cross-sectional and longitudinal associations between the self-esteem of 95 Belgian children and classroom engagement during their first few years of school. Children's global self-esteem was assessed through a puppet interview procedure in kindergarten, and children's kindergarten and third grade teachers reported on aspects of their engagement including participation, interest, independent work styles, and a preference for challenge. Relative to their peers, children with more positive self-esteem in kindergarten were rated by their kindergarten teachers as showing higher levels of engagement, after controlling for gender and vocabulary (Verschueren et al., 1996). Furthermore, these children were also rated as having higher levels of engagement by their third grade teacher, three years later, and this association remained significant when controlling for kindergarten engagement levels (Verschueren et al., 2001).

2.3.4.4 Mental health problems.

2.3.4.4.1 The nature and prevalence of preschool mental health problems.

It is reasonably common for preschool children to exhibit difficult behaviours, such as overactivity, poor impulse control, noncompliance, tantrums, social withdrawal, and anxiety. As isolated behaviours, these are not necessarily cause for concern and often

disappear with time, given that children are still developing self-regulatory skills during the preschool period (Campbell, 1995). However, some children show multiple problems that are severe in nature, pervasive across contexts, witnessed by multiple informants, and persist beyond the occurrence of obvious stressors or developmental transitions. It is these mental health problems that are beyond the realm of normal development, and significantly impair children's daily functioning (Campbell, 1995; Lavigne et al., 1996). Based on these criteria, the prevalence of mental health problems during preschool is estimated at around 10-15% (Campbell, 1995; Egger & Angold, 2006; Lavigne, LeBailly, Hopkins, Gouze, & Binns, 2009). This percentage is only slightly lower when impairment is also a criterion (Egger & Angold, 2006; Keenan, Shaw, Walsh, Delliquadri, & Giovannelli, 1997; Lavigne et al., 2009). It is worth noting that these rates are very similar to those described for older children and adolescents (Costello, Egger, & Angold, 2005; Sawyer et al., 2001). This suggests that mental health problems are not simply confined to later childhood and adolescence, and affect children of all ages.

Preschool mental health problems are commonly grouped into two broad dimensions: externalising symptoms and internalising symptoms. Externalising symptoms consist of under-controlled behaviour that is expressed outwardly, including hyperactivity or disruptive behaviour. Internalising symptoms consist of over-controlled behaviour that is directed inwardly, such as anxiety and depression (Achenbach, McConaughy, & Howell, 1987; Campbell, 2006; Sterba, Egger, & Angold, 2007). Externalising problems are more common than internalising problems during the preschool years. Specifically, preschool children most commonly show problems with hyperactivity and inattention, conduct and discipline problems, and non-compliance and aggression (Campbell, Shaw, & Gilliom, 2000). Of the children who are formally diagnosed in clinical settings, the majority suffer from oppositional defiant disorder (ODD) and attention-deficit/hyperactivity disorder (ADHD) (Gadow, Sprafkin, & Nolan, 2001; Sprafkin, Volpe, Gadow, Nolan, & Kelly, 2002; Wilens et al., 2002). Few representative epidemiological studies have been conducted with preschoolers (Egger & Angold, 2006; Keenan et al., 1997; Lavigne et al., 1998a; Lavigne et al., 2009). Estimates of the prevalence of ODD varies widely between studies

(4 to 16%), and are highest during the preschool years, and across later childhood and adolescence (Egger & Angold, 2006; Lavigne et al., 2009). Prevalence of ADHD is estimated at about 2 to 6% in preschool, and remains stable throughout childhood and adolescence (Egger & Angold, 2006; Lavigne et al., 2009). In contrast, internalising problems are less common in preschool, and receive less attention from clinicians and service providers (Campbell, 1995; Kerr, Lunkenheimer, & Olson, 2007). Internalising problems such as specific and generalised anxiety disorder and depression are experienced by approximately 1% of preschoolers (Egger & Angold, 2006; Lavigne et al., 2009). Prevalence of depression generally reaches a peak in adolescence (Egger & Angold, 2006).

Comorbidity also appears to be common in preschool children with mental health problems. Approximately 25% of children with externalising disorders also have comorbid internalising disorders, and vice versa (Keenan et al., 1997; Lavigne et al., 1998a). For example, depressive disorder, anxiety disorder, conduct disorder (CD), ODD, and ADHD were assessed in a representative pediatric clinic sample of 307 2-5 year olds (Egger & Angold, 2006). Approximately 50% of the preschoolers who met criteria for one disorder had two or more types of disorder. Comorbidity appears to be higher between externalising disorders (Egger & Angold, 2006; Lavigne et al., 2009).

Subgroups of children who manifest specific patterns of co-occurring mental health problems can also be identified using cluster analysis techniques. Cluster-analytic studies in preschool-aged community samples generally find a large 'no problems' cluster, several small clusters with elevated but sub-clinical level problems (i.e., below pre-defined cut-offs) in one domain, and one or two small clusters of children with clinical-level problems (above pre-defined cut-offs). Within these clinical clusters, children experience multiple problems across many domains, but particularly externalising problems including ADHD, ODD and CD (Beg, Casey, & Saunders, 2007; Bulotsky-Shearer, Fantuzzo, & McDermott, 2010; Larsson, Bergman, Earls, & Rydelius, 2004; Sonuga-Barke, Thompson, Stevenson, & Viney, 1997). Additionally, several of these studies found an 'over-active' cluster that resembled the clinical group in pattern but not severity (Beg et al., 2007; Bulotsky-Shearer et al., 2010; Sonuga-Barke et al., 1997).

Gender differences in the prevalence of mental health problems also start to emerge during this age. However, the evidence base is inconsistent as to whether significant gender differences exist during the preschool period (see Campbell, 1995; Egger & Angold, 2006). Studies that do detect gender differences in the prevalence of disorder typically report higher levels of externalising symptoms in boys, such as hyperactivity, inattention, and oppositional behaviour. However, the majority of studies fail to find gender differences in the levels of preschool internalising problems (Egger & Angold, 2006; Keenan & Shaw, 1997; Lavigne et al., 2009; Qi & Kaiser, 2003).There is also evidence from cluster analytic studies that co-morbid mental health problems (which mostly occur between externalising problems) are more common in boys (Beg et al., 2007; Bulotsky-Shearer et al., 2010; Larsson et al., 2004; Sonuga-Barke et al., 1997).

Many preschool problems demonstrate considerable stability into early childhood and adolescence, and even adulthood. Retrospective reports conducted in school-age children showed that many of their mental health problems began in the preschool years (e.g., Applegate et al., 1997). In a review of the extant literature, Campbell (1995) noted that 'hard-to-manage' preschoolers had an approximately 50% chance of experiencing continuing difficulties through middle childhood, and into adolescence. For example, Lavigne and colleagues (Lavigne et al., 1998a) found that in a community sample of 344 preschoolers, 78% of those initially diagnosed with an emotional disorder, and 73% of those diagnosed with a disruptive disorder, still experienced these problems at follow-up, between 2 to 5 years later. The Dunedin Multidisciplinary Health and Development Study, a large-scale longitudinal prospective study of a complete age cohort of Dunedin children (n = 1037), followed participants from birth into adulthood. The children with high levels of externalising problems at age 3 had a 1 in 2 chance of meeting diagnostic criteria for ADHD at 15 (McGee, Partridge, Williams, & Silva, 1991), and were two to three times as likely as comparisons to meet criteria for antisocial personality disorder and to be involved in crime at age 21 (Caspi, Moffitt, Newman, & Silva, 1996). In contrast, children with internalising problems at 3 were more than twice as likely to meet diagnostic criteria for depression at 21 (Caspi et al., 1996). Stability is especially pronounced in children with

externalising problems, problems witnessed across contexts, and co-existent multiple family-level stressors (Lavigne et al., 1998b). In sum, many preschool mental health problems may represent significant and lasting problems, and thus are cause for concern.

Given this evidence, it is important for mental health problems to be identified and treated during preschool, before they stabilise and adversely affect children's school functioning. Problems that are only acted upon at school age are much more resistant to change (Hinshaw, 1994). By this time, problems may also adversely affect children's functioning in other areas, such as peer relationships, self-esteem, academic achievement and risky behaviours including truancy (Hinshaw, 1992; Masten et al., 2005). Mental health problems during the school years are also more likely to be associated with stigma, given that, compared with preschool, school is a much more evaluative and competitive environment. Furthermore, children often remain in the same school environment with the same school record for several years (Alexander et al., 1988; Arnold et al., 2006). Yet relatively few preschool children with significant mental health problems receive professional help: some studies have shown only 10-25% of preschool children with a diagnosable disorder are referred for treatment or evaluation (Egger & Angold, 2006; Lavigne et al., 1998a). Therefore, if the practice of 'watchful waiting' until school age is continued, it is unlikely that children's problems will be adequately addressed (Arnold et al., 2006; Qi & Kaiser, 2003; Raver, 2002).

2.3.4.4.2 Potential relevance to classroom engagement.

Children's mental health problems in preschool have the potential to adversely affect their engagement during the first year of school (illustrated in Panel D of Figure 2.1). Associations between these two variables are theoretically logical. For example, Maslow's psychological Hierarchy of Needs theory would suggest that children cannot begin to meet higher-order cognitive growth needs of exploring, learning, creating and understanding during classroom activities unless their more basic lower-order needs of emotional well-being are met (Brophy, 2004; Maslow, 1943). Additionally, children's mental health and classroom engagement are seen as closely linked within some educational spheres. Specifically, good mental health is considered to be an important

prerequisite for children's engagement, and subsequent deep-level learning and achievement (Laevers, 1994; Pascal, Bertram, Mould, & Hall, 1998; Winter, 2003). In simple terms, if children do not feel at-ease, their exploratory drive will not be activated, and they cannot fully attend to learning (Ramey & Ramey, 1994; Winter, 2003).

At least two research groups have proposed that mental health problems and classroom engagement are related due to the fact that both are associated with similar school-related outcomes (Fantuzzo, Bulotsky-Shearer, Fusco, & McWayne, 2005; Roeser, Eccles, & Stroebel, 1998; Roeser, Stroebel, & Quihuis, 2002). They both predict children's academic achievement in literacy, reading and mathematics, up to 5 years later (Bodovski & Farkas, 2007; Burchinal et al., 2008; Claessens et al., 2009; O'Connor & McCartney, 2007; Walker & Berthelsen, 2007). However, when both variables are included in the same regression model, the effect of mental health problems on achievement outcomes is often small and non-significant, which suggests its apparent 'effect' may be at least partially mediated by engagement (Claessens et al., 2009; Duncan et al., 2007; Walker & Berthelsen, 2007). Additionally, mental health problems (particularly aggressive and hyperactive behaviour) and behavioural engagement during the early school years have both been implicated in the processes leading to high school dropout (Alexander, Entwisle, & Horsey, 1997; Ensminger & Slusarcick, 1992; Jimerson, Egeland, Sroufe, & Carlson, 2000; Luster & McAdoo, 1996; Pagani, Vitaro, Tremblay, & McDuff, 2008; Vitaro, Brendgen, Larose, & Tremblay, 2005).

Furthermore, when considered as outcome variables, mental health problems and engagement both have similar predictors. Specifically, both are predicted by parental attachment, and the quality of children's relationships with parents and teachers. Several of the previously-mentioned longitudinal studies that linked these relationship variables with engagement also found similar effect sizes for links between parent-child and teacher-child relationships and mental health problems (Ewing & Taylor, 2009; Hamre & Pianta, 2001; Ladd & Burgess, 2001; NICHD, 2003, 2005a; Peisner-Feinberg et al., 2001; K. E. Perry et al., 2007; Pianta & Nimetz, 1991; Pianta et al., 1997; Pianta et al., 1995; Smeekens et al., 2009; Sturge-Apple et al., 2006). Though the bulk of this research examined externalising

behaviour problems such as inattention, aggressiveness and misconduct, there is also evidence of small significant negative links between teacher-child relationship quality and internalising problems such as anxiety, depression and fearfulness (Ewing & Taylor, 2009; K. E. Perry et al., 2007).

More recently, a number of studies have considered both variables simultaneously, as both are recognised as important components of the multifaceted nature of school readiness and adjustment (see Hair et al., 2006). Yet even within this literature, these two constructs are most often treated either as unique predictors (e.g., Bodovski & Farkas, 2007; Claessens et al., 2009; O'Connor & McCartney, 2007; Walker & Berthelsen, 2007), or as distinct outcome variables within separate statistical models (e.g., Bierman et al., 2008; Burchinal et al., 2008; Coolahan, Fantuzzo, Mendez, & McDermott, 2000; Ewing & Taylor, 2009; K. E. Perry et al., 2007; Pianta et al., 1995; Smeekens et al., 2009; Sturge-Apple et al., 2006; Verschueren & Marcoen, 1999; Wu, West, & Hughes, 2010). These studies generally demonstrate moderate to large correlations between the two variables, providing evidence that that these variables are in some way related. However, most of these associations are cross-sectional, and thus do not provide any information regarding the possible direction of influence. Only a few studies have demonstrated longitudinal associations between these variables. In these studies, mental health problems predicted children's subsequent engagement during the early school years (Fantuzzo et al., 2005; Hair et al., 2006; Smart, Sanson, Baxter, Edwards, & Hayes, 2008). However, basic bivariate links provide little insight into the broader processes involved in this association.

One specific possibility for the ways in which mental health problems and engagement may be related can be extrapolated from the literature examining the co-occurrence of mental health problems and learning problems. Within this literature, numerous studies have documented the high overlap between mental health problems and learning problems, often estimated at around 50%, which is significantly greater than would be expected by chance (Hinshaw, 1992; Rutter & Yule, 1970; Sanson, Prior, & Smart, 1996; Smart, Sanson, & Prior, 1996; Willcutt & Pennington, 2000a). Although the association between these two problems is likely to be complex and transactional, there is

more longitudinal evidence that mental health problems lead to learning problems, rather than other way around (McGee, Williams, Share, Anderson, & Silva, 1986; Prior, Smart, Sanson, & Oberklaid, 1999; Sanson et al., 1996; Smart et al., 1996; Stipek & Miles, 2008). This link is predominantly attributed to the role of attention deficits, since other externalising problems are no longer related to learning problems after adjusting for attention deficits (C. Clark, Prior, & Kinsella, 2000; Hinshaw, 1992; Maughan, Pickles, Hagell, Rutter, & Yule, 1996; Rapport, Scanlan, & Denney, 1999; Smart et al., 1996; Willcutt & Pennington, 2000b). Rutter and Yule (1970) hypothesised that mental health problems (particularly attention deficits) may influence the development of learning problems by significantly interfering with the classroom learning process. It could be argued that preventing opportunities for classroom engagement is part of this 'learning disruption'. From this, one could hypothesise that the association between mental health problems and later educational difficulties may be mediated by classroom engagement.

Five studies have examined associations between mental health problems, engagement and learning outcomes in the same process model, and their results provide support for Rutter and Yule's (1970) hypothesis. Volpe and colleagues (2006) conducted a cross-sectional study of 146 children in first through fourth grade, the majority of whom were formally diagnosed with ADHD. After adjusting for prior achievement and interpersonal skills, the children's teacher-reported engagement (measured as motivation and study skills) fully mediated the association between their teacher-reported ADHD symptom severity and reading and mathematics achievement. Additionally, McWayne & Cheung (2009) found that 162 low-income Head Start children's preschool teacher-reported engagement (termed approaches to learning), along with their cognitive, social and motor skills, fully mediated the association between their preschool behaviour problems during peer play and their later academic outcomes in first grade.

Two studies provide temporal precedence for the effect of mental health problems on engagement. Firstly, Escalon and Greenfield (2009) found that 196 Head Start children's mid-year engagement fully mediated the association between their start-of-year externalising problems, and their gains in literacy and mathematics across the school year.

Secondly, Normandeau and Guay (1998) studied 291 French-Canadian children, and found that their teacher-reported engagement in first grade (termed cognitive self-control, and measuring persistence, attention, and problem-solving) fully mediated the association between aggressive behaviour in kindergarten and achievement in mathematics and French in first grade. Though children's anxious and withdrawn behaviour was also examined, it was only bivariately related to engagement, and was not directly related to engagement when all other model variables were included.

In a study conducted with older children (n = 325, aged 7-15 years), Rapport and colleagues (2001) found that children's teacher-rated classroom performance (a variable assessing aspects of engagement, such as paying attention, following instructions, and working carefully and independently) fully mediated associations between their concurrent teacher-rated withdrawal symptoms, and their achievement when tested 3-4 years later. However, engagement did not mediate the association between the children's teacher-rated anxiety and depression symptoms and achievement; instead, this association was mediated by the children's cognitive functioning. These results suggest that the capacity of engagement to significantly mediate associations between internalising problems and achievement may depend on the specific type of internalising symptom assessed.

Thus, there is some preliminary and mostly cross-sectional evidence that mental health problems are related to engagement. These results also suggest that engagement is more proximal than mental health problems to children's academic success.

2.3.4.4.3 The role of gender.

An important consideration when examining the association between mental health problems and engagement is the role of gender. It has already been mentioned that gender differences are often found for both externalising mental health problems and classroom engagement during the school transition period. Specifically, boys fare worse in both domains, showing higher levels of externalising problems, and lower levels of classroom engagement (Berthelsen & Walker, 2009; Childs & McKay, 2001; Egger & Angold, 2006; Keenan & Shaw, 1997; Ladd et al., 1999; Lavigne et al., 2009; Qi & Kaiser,

2003; Tach & Farkas, 2006). Therefore, it is quite possible that gender may be somehow implicated in the associations between them.

One possibility is that gender differences in mental health problems may at least partially explain gender differences in engagement. As preschool mental health problems may influence classroom engagement at school, it is possible that a large part of girls' higher levels of engagement may be due to their lower level of mental health problems. If this is true, then gender differences in levels of engagement may be significantly reduced when adjusting for mental health problems. A similar effect has been demonstrated by Ready and colleagues (2005), using data from the Early Childhood Longitudinal Study – Kindergarten cohort (ECLS-K). In this study, girls demonstrated superior literacy skills compared with boys, not only showing higher literacy levels at kindergarten entry, but also experiencing greater growth in these skills across the year. Additionally, girls showed higher levels of engagement, self-control, and interpersonal skills, and lower levels of internalising and externalising problems than boys. Adjusting for any one of these predictors reduced the gender gap in children's literacy growth. However, the one variable that explained most of the gender effect on literacy growth was engagement, reducing the gap by 70% (with standardised regression coefficients reducing from .07 to .02). This small effect was still statistically significant due to the extremely large sample size (over 16,000 children). Furthermore, including all of the predictor variables in the one regression model did not reduce the gender gap any further than in a model consisting of engagement alone.

Similarly, Ponitz and colleagues (2009) demonstrated that significant gender differences in self-control were completely explained by the children's initial adjustment to the classroom learning environment. In this sample (n = 172), girls demonstrated a medium-sized advantage in teacher-reported classroom self-control at the end of first grade, which included higher levels of attention and working with care. Gender differences were also seen as soon as the school year began, with teachers reporting girls as more able to adjust to the classroom learning environment, and showing fewer social, behavioural and academic difficulties. Moreover, the gender differences in self-control were no longer

significant after controlling for early classroom adjustment, which explained most of the girls' advantage.

Of the few studies examining associations between children's mental health problems and their classroom engagement, none has examined whether this association can account for gender differences in engagement. Several of these studies do not examine gender as a covariate (Baker, Clark, Crowl, & Carlson, 2009; Baker, Clark, Maier, & Viger, 2008; J. N. Hughes & Kwok, 2006; McWayne & Cheung, 2009; Normandeau & Guay, 1998; Volpe et al., 2006; Wentzel, 1993). Of the studies that do, none reported information regarding the gender effect size before and after adjusting for mental health problems (e.g., Fantuzzo et al., 2005; Ladd et al., 1999; Ladd & Burgess, 2001). Thus, existing research provides little information as to whether gender differences in children's engagement may be an artefact of their previous levels of mental health problems. This information would be useful for preschool interventions and school readiness programs, given that girls and boys may start school on more equal footing if their mental health problems can be addressed prior to the transition.

A second possibility is that the strength of associations between mental health problems and engagement may differ by gender. Specifically, one tenable hypothesis is that certain mental health problems and engagement may be more strongly (negatively) related in one gender. This hypothesis could be readily addressed by examining differential associations between variables using interaction terms within regression analyses. However, only one study has tested this hypothesis. In this study, associations between externalising mental health problems and classroom engagement (both reported by teachers) were examined in 196 disadvantaged preschool children attending a Head Start program (Escalon & Greenfield, 2009). However, the association between these variables was similar for both boys and girls, so gender did not moderate this link.

Indirect support for gender-specific associations comes from several studies that found differential links between mental health problems and other educational outcomes like language/literacy skills between boys and girls. As engagement has been shown to mediate the association between these two constructs (see DiPerna, Volpe, & Elliott, 2002;

Volpe et al., 2006), it is possible that links between mental health problems and engagement will also differ by gender. Several studies have shown stronger negative associations between externalising mental health problems and educational outcomes in boys, than in girls. For example, in small samples of ethnically and socio-economically diverse preschool children, there were stronger links between boys' language and literacy skills and disruptive behaviour (Stowe, Arnold, & Ortiz, 2000) and aggressive behaviour (Doctoroff, Greer, & Arnold, 2006) than in girls. In both instances, associations between behaviour problems and language/literacy skills were moderate and negative for boys, whereas little or no association existed in girls. Similar interactive effects for reading problems have been demonstrated in samples of school-aged children and adolescents. For example, cross-sectional associations between reading disorder diagnosis and levels of both ADHD severity and aggressive behaviour were stronger in boys (Willcutt & Pennington, 2000a, 2000b). Specifically, the externalising differences seen between boys and girls (with boys consistently showing higher levels of problems) were more pronounced in the children diagnosed with reading disorder. Similar effects have been demonstrated between reading problems and antisocial behaviour in adolescents (Maughan et al., 1996; Williams & McGee, 1994).

It is also possible that stronger links between internalising problems and engagement may be found for girls. This hypothesis stems from Willcutt and Pennington's (2000b) finding that cross-sectional associations between reading disorder diagnosis and levels of withdrawn and anxious-depressed behaviour were stronger in girls. Whilst boys and girls without reading disorder did not differ on their levels of these internalising problems, the internalising problems seen in the reading disorder group were significantly higher in the girls compared with the boys. However, it is important to note that this sample ranged in age from 8 to 18 years (M = 10.6 years). During the adolescent years, levels of internalising problems are significantly higher in girls (see Costello et al., 2005; Egger & Angold, 2006). Thus, the specific pathology of this age group may mean that these results do not generalise to preschool-aged children, given at this age, internalising rates are low, and gender differences are non-existent. In fact, a similar study assessing

gender differences in the association between negative affect and emergent literacy in preschool children failed to find an interactive effect (Doctoroff et al., 2006). There is therefore less support for an internalising interaction hypothesis.

It can be seen that analyses using interaction terms are useful for examining associations between mental health problems and engagement across genders. However, this approach cannot fully examine all effects occurring in children's development. This is because this approach relies on associations between *variables* (these approaches are broadly referred to as 'variable-centred' within the literature). Such 'variable-centred' analyses are limited to examining linear covariance-type associations between variables, across the sample (or across the two gender sub-samples) as a whole. Thus, this approach assumes that development is homogenous, and that any effects found apply to the whole sample in a study (Bergman & Magnusson, 1997). However, it is likely that a number of subgroups exist within samples, which show different patterns of development. Thus, examination of general trends may miss important effects occurring within subgroups. Another consequence of this approach is that analyses can only examine associations *between* variables, and not how several variables co-occur within children. Thus, it is more difficult to examine the issue of co-morbidity. This is important, given that there is reasonable likelihood of experiencing co-morbid externalising problems, rather than any one in isolation, and particularly in boys (Beg et al., 2007; Campbell, 2006).

Alternatively, 'person-centred' approaches examine associations between *children*, and thus may yield different and complementary insights into children's development. Person-centred analyses identify and compare homogenous subgroups of children, who manifest different patterns of development (Bergman & Magnusson, 1997; Cairns, Bergman, & Kagan, 1998). When this approach is used, subgroups of children are initially identified through procedures such as cluster analysis or latent class analysis. Differences between groups on other criterion variables can then be examined using chi square tests for independence and multivariate analyses of variance (MANOVAs). This makes it possible to determine whether specific patterns of mental health problems and

engagement co-occur more often in particular groups of children, who may be predominantly of one gender.

Masten and colleagues (1990) suggested that girls and boys may manifest different patterns of mental health and engagement problems in response to stress. From their detailed subgroup analyses and interviews with children experiencing cumulative family risk, they identified an externalising pattern of stress response, involving disruptive behaviour and disengagement from classroom activities, which was more common in boys. In contrast, a distinct internalising pattern of stress response emerged, involving classroom disengagement that was not coupled with disruptive behaviour, that was more characteristic of girls.

Results from cluster analysis studies of preschool to first grade children are consistent with Masten and colleagues' (1990) male disruptive-disengaged stress response pattern. Three studies examined economically-disadvantaged ethnic minority samples on several emotional, behavioural, social, cognitive and engagement variables (Bulotsky-Shearer et al., 2010; Luo et al., 2009; McWayne et al., 2004). A small cluster of 'maladapted' children was identified in all of these studies (generally including approximately 10-20% of the sample). These children were characterised by severe problems, with a predominance of disruptive, hyperactive, antisocial, and aggressive behaviour, and low classroom engagement. These 'maladapted' clusters contained significantly more boys (61 to 70%). A similar 'maladapted' cluster (70% boys) was also identified in a relatively advantaged community sample of 107 5-year-olds (Smeekens et al., 2008).

Additionally, Bulotsky-Shearer and colleagues (2010) identified a cluster resembling the 'mildly disruptive' clusters found in the studies that examined patterns of mental health problems in preschool (see section 2.3.4.4.1, e.g., Kamphaus, Huberty, DiStefano, & Petoskey, 1997; Sonuga-Barke et al., 1997). This cluster (at 19% of the sample) showed elevated but not clinical levels of aggressive, oppositional and inattentive behaviour. Furthermore, children within this cluster also showed low levels of engagement within

structured learning activities. This group was predominantly boys (58%), though this difference was not statistically significant.

In a similar vein, person-centred analyses have consistently demonstrated that learning disorders and externalising mental health problems are much more likely to co-occur in boys. For example, in 678 first grade ethnic minority children, approximately half of the boys with low reading and mathematics achievement also exhibited high levels of aggressive, oppositional and inattentive behaviour problems. In contrast, only one third of girls with low achievement levels also showed externalising problems (Reinke, Herman, Petras, & Ialongo, 2008). Similarly, the Australian Temperament Project data for 1205 7-8 year olds indicated that two thirds of reading disordered boys also had general/pervasive mental health problems, with especially high levels of hyperactivity, whereas only one third of reading disordered girls had accompanying mental health problems (Smart et al., 1996).

Little supporting evidence exists for the 'internalising' pattern of disengagement existing predominantly in girls, described by Masten and colleagues (1990). Though three of the abovementioned studies did find profiles characterised by overcontrolled, internalising behaviour and low engagement, gender differences were not consistent. Specifically, two studies actually found a greater proportion of boys in these clusters (58% to 70%), though these differences were not significant (Luo et al., 2009; Smeekens et al., 2008). In contrast, Bulotsky-Shearer and colleagues (2010) found a greater proportion of girls in their internalising cluster (at 61%), but this difference was also not significant.

When combined, results from both variable- and person-centred approaches suggest that educational problems (including learning problems, low achievement, and low engagement) and externalising behaviour problems are more strongly related, and are more likely to co-occur, in boys. In classrooms, externalising problems are more visible and disruptive of the learning process than are internalising problems (Arnold & Doctoroff, 2003; Campbell, 2006). Because of their higher likelihood of exhibiting disruptive behaviours, boys with learning and engagement problems may be more commonly referred for special education services by their teachers. This may especially occur in the early years of schooling, when there is less formal and standardised testing

available to identify learning problems (Arnold & Doctoroff, 2003). This may at least partially explain why two to four times as many boys as girls are referred by teachers for special education services, despite the gender prevalence of learning disorders being equivalent when they have been accurately assessed (see Flynn & Rahbar, 1994; Sanson et al., 1996; Shaywitz, Shaywitz, Fletcher, & Escobar, 1990; Willcutt & Pennington, 2000b).

As a consequence, girls' educational problems may be less obvious in the classroom, and under-identified by teachers. In their qualitative research on 4 to 7 year old children, Morgan and Dunn (1988) referred to this as the 'invisible girls' phenomenon: boys were more likely to have obvious positive or negative profiles in the classroom, whereas the children who went unnoticed were much more likely to be girls. Thus, while researchers observed that girls who were experiencing difficulties tended to conceal them, boys with problems were more vocal, and attracted teacher attention. Indeed, evidence has shown that children are much more likely to be referred for special education services if they have high levels of behavioural problems, whether or not any language, learning or reading problems are present (Shaywitz et al., 1990; Stowe et al., 2000).

2.3.5 Synthesising the evidence within a process model.

Thus far, I have provided evidence that children's relationships with parents and teachers, and their self-concept and mental health problems are associated with their classroom engagement in the early school years. However, associations between these predictors and engagement are likely to involve more than simple bivariate associations. The mechanisms by which several of these predictors work together to influence children's engagement is outlined within the Self-Systems Process Model (see Figure 2.2) (Connell, 1990; Connell & Wellborn, 1991). This model is described as "adevelopmental" (Connell, 1990, p. 66), in that the general linkages are assumed to apply similarly across the lifespan (Connell, 1990, pp. 69-70). Within this model, classroom engagement is thought to be shaped by the ongoing interaction between a child and his/her social partners, but particularly by interactions with parents and teachers, as children spend most of their time with these adults (Connell, 1990).

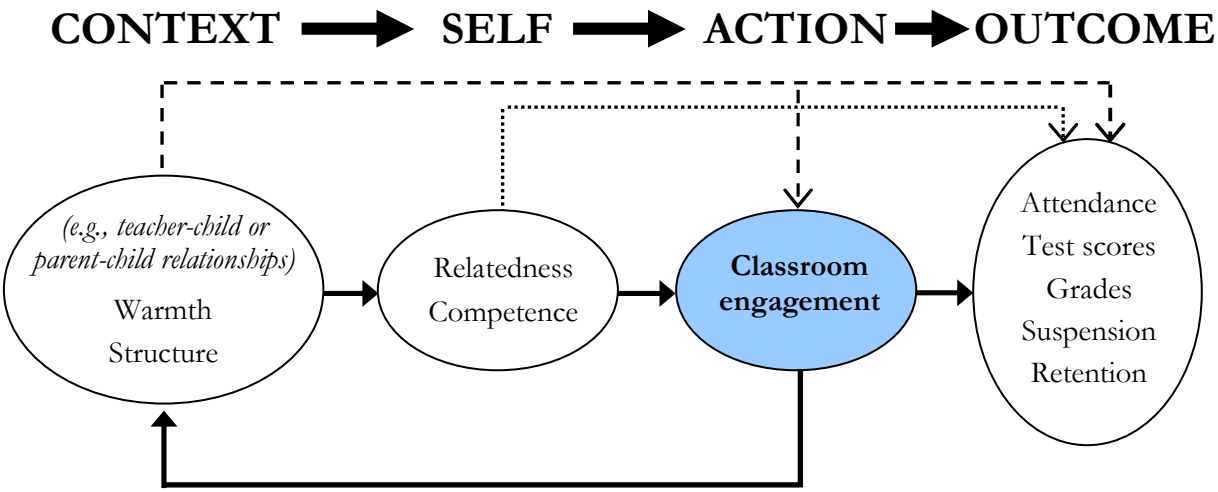


Figure 2.2. The Self-Systems Process Model of Engagement (Connell, 1990; Connell & Wellborn, 1991). Hypothesised paths are indicated by unbroken arrows (suggesting full mediation). Dotted arrows indicate the direct empirical associations found within several studies (Connell et al., 1995; Connell et al., 1994; Grolnick, Ryan, & Deci, 1991; Sharkey et al., 2008; Skinner et al., 2008; Skinner et al., 1990; Zimmer-Gembeck, Chipuer, Hanisch, Creed, & McGregor, 2006).

The basic assumption of the Self-Systems Model is that humans are guided by fundamental psychological needs, such as self-concepts of high competence and relatedness. Competence is described as feeling capable of producing desired outcomes, and avoiding negative ones, consistent with conceptions of self-efficacy (Bandura, 1977; Connell, 1990). Relatedness is defined as feeling securely connected to social partners, and worthy and capable of being loved, consistent with conceptions of self-esteem (Connell, 1990; Covington & Beery, 1976). Children attempt to meet these needs through social interactions, which then shape their self-concepts, referred to as self-system processes. When children's relationships are characterised by warmth, structure and support, their psychological needs are met, and children perceive themselves as capable and worthy of love. These positive self-system processes are thought to be the driving force that initiates engagement in classroom learning. In turn, children's engagement subsequently influences both positive and negative school outcomes, including learning and achievement, 'risk behaviours' such as school absences, detention, suspension and retention, and school

dropout (Connell, 1990; Connell & Wellborn, 1991). In sum, this model links children's context, self, action, and outcomes (see Figure 2.2).

Thus, Self-Systems Theory proposes a series of hypotheses involving 'full mediation' (Connell & Wellborn, 1991), where the mediator variable is able to completely account for the association between the independent and dependent variables (Baron & Kenny, 1986; Shrout & Bolger, 2002, see also Appendix F for more a detailed explanation). In particular, the only direct influence on children's engagement is thought to be from their self-system processes (competence and relatedness), which are hypothesised to fully mediate the association between children's relationships with key social partners and their classroom engagement. Furthermore, engagement is considered the only direct predictor of children's school outcomes (Connell, 1990; Connell & Wellborn, 1991). As these hypotheses specify the processes by which certain social contexts may promote children's engagement, results from studies based on this model may provide useful information regarding where intervention efforts may be best directed.

These hypotheses are by no means new; ideas contained within the Self-Systems Model were drawn from several developmental theories (see discussion in Connell, 1990). For example, attachment theory states that children's relationships with adult attachment figures influence their exploration and engagement by first influencing the development of their 'internal working models' (Bowlby, 1969/1982; Bretherton & Mulholland, 1999; Cassidy, 1999; Weinfield et al., 1999). These working models are children's mental representations of the attachment figure, the self, and the environment, which are complementary and intertwined, and develop from the history of care within the attachment relationship (Bretherton, 1985). Thus, when children experience consistently warm, supportive and responsive care, they come to view the attachment figure as someone who will help them when needed, and the self as worthy of this support, and effective at eliciting it (Bretherton & Mulholland, 1999; Cassidy, 1999; Weinfield et al., 1999). These views allow children to anticipate the outcomes of future interactions, which guide their subsequent behaviour. The development of positive internal working models allows children to use the parent as a 'secure base' from which to confidently explore and

engage with the environment, as they believe that they can successfully influence the world around them, and that their attachment figure will be available and able to provide them with comfort and support if needed (Ainsworth, 1969; Waters & Cummings, 2000; Weinfield et al., 1999). However, the Self-Systems Model is the only model to explicitly frame such pathways in specific educational contexts, using classroom engagement as the developmental outcome.

2.3.5.1 Broad evidence for the model.

Few studies have tested the processes hypothesised to influence engagement within the Self-Systems Model. Even fewer have tested links between all four model components (i.e., context, self, action and outcome, see Figure 2.2) within the one study. Of the studies testing these links, most have been conducted by James Connell, Ellen Skinner and their colleagues, using two samples. The first sample consisted of third to sixth grade middle to lower class children from a rural/suburban school district, most of whom were Caucasian (Skinner et al., 2008; Skinner et al., 1990; Skinner et al., 1998). The second sample was comprised of predominantly poor adolescents from urban middle schools, most of whom were African American (Connell et al., 1995; Connell et al., 1994). Results of these studies supported the associations between variables as proposed in the model. In particular, they showed that good quality relationships with parents and teachers positively influenced children's self-concepts of competence and relatedness, and in turn, these positive self-concepts promoted emotional and behavioural classroom engagement (Connell et al., 1995; Connell et al., 1994; Skinner et al., 2008; Skinner et al., 1990; Skinner et al., 1998). Additionally, in the studies including an 'outcome' component, engagement was the strongest predictor of achievement, attendance, suspension, and staying in school (Connell et al., 1995; Connell et al., 1994; Skinner et al., 1990; Skinner et al., 1998). Several cross-sectional studies by other researchers have largely corroborated these results (Buhs, 2005; Grolnick et al., 1991; Sharkey et al., 2008; Tucker et al., 2002; Zimmer-Gembeck et al., 2006).

Three main points are worth noting regarding these studies. First, some unexpected direct effects suggest that some variables only act as partial mediators, rather

than the full mediators hypothesised in the Self-Systems Model (see Connell, 1990). Specifically, over and above their mediated effects, children's relationships with teachers directly predicted their engagement, and both teacher relationships and self-system processes directly predicted their school outcomes (see the dotted paths in Figure 2.2) (Connell et al., 1995; Connell et al., 1994; Grolnick et al., 1991; Sharkey et al., 2008; Skinner et al., 2008; Skinner et al., 1990; Zimmer-Gembeck et al., 2006). Second, though these studies tested hypotheses that involve mediation, not all used statistical mediation analyses (see Baron & Kenny, 1986; Shrout & Bolger, 2002) that test the size and significance of (1) the independent – dependent association, (2) its subsequent reduction when the proposed mediator is included, or (3) the mediated effect (Connell et al., 1995; Connell et al., 1994; Grolnick et al., 1991; Skinner et al., 1990; Skinner et al., 1998). Without this information, it could not be determined how much of the total variance that child-adult relationships explained in engagement was due to children's self-system processes. Third, these studies were largely cross-sectional. Two studies included single longitudinal components, for example, between engagement and subsequent school outcomes (Connell et al., 1995; Skinner et al., 1998); however, no study has conducted a completely longitudinal examination, with all variables assessed at different time-points. So although it appears that the model variables are indeed related, the direction of the pathways between them has not been verified. For example, it may be that children's self-concepts influence the relationships they form, by being able to elicit certain reactions from adults. It is more likely that causal influences operate in both directions, and although the Self-Systems Model does allow for certain 'feedback loops' (e.g., engagement influencing subsequent self-concept, see Figure 2.2, and Skinner et al., 1998), such assertions have not yet been properly tested.

2.3.5.2 Evidence for the model in the early school years.

Importantly, no prospective study has examined the predictors of children's classroom engagement in their first school year, as specified by the Self-Systems Process Model. Indeed, few studies have examined processes that influence children's engagement prior to third grade. The most relevant study was conducted by Thijs and Koomen (2008),

who tested a mediating hypothesis that was consistent with the Self-Systems Model, by observing teacher-child interactions in a small sample of 79 kindergarten children. After adjusting for gender and social inhibition, the positive association found between supportive teacher behaviours and children's engagement (persistence and independence) during the task was partially mediated by children's observed emotional security. However, due to the cross-sectional nature of these associations, it cannot be assumed that promoting teacher support and emotional security prior to the school transition will boost children's engagement during school. Additionally, Tucker and colleagues (2002) found cross-sectional support for the Self-Systems Model in a small sample of first through to twelfth grade students (n = 117), of which only 48 were in the first through to sixth grades. As both of these studies examined only the teacher-child relationship, there is no evidence for the role of parent-child relationships as indirectly promoting children's engagement in the early school years.

However, all of the bivariate associations within the Self-Systems Model have been supported during the preschool and early school years. As discussed earlier (in sections 2.3.4.1 to 2.3.4.3), young children's relationships with parents and teachers and their self-concept are all individually related to their engagement. There is also a small amount of evidence (most of which is cross-sectional) that parent-child and teacher-child relationships and self-concept are significantly related in the early school years, which I now review.

Several cross-sectional studies have demonstrated that better quality parent-child relationships are associated with higher levels of self-esteem in both preschool and kindergarten children (Cassidy, 1988; S. E. Clark & Symons, 2000; Verschueren & Marcoen, 1999; Verschueren et al., 1996). Furthermore, three studies have demonstrated longitudinal associations between children's maternal attachment relationships and their subsequent self-esteem in preschool (Goodvin, Meyer, Thompson, & Hayes, 2008; Toth, Cicchetti, Macfie, & Emde, 1997; Toth, Rogosch, Sturge-Apple, & Cicchetti, 2009). For example, Toth and colleagues (2009) studied 131 children of relatively advantaged mothers, approximately half of whom had a history of major depressive disorder.

Observed insecurity in the children's maternal attachment relationships at 3 years showed a small significant positive association with the change in their negative representations of self between 3 and 4 years of age, while controlling for their verbal abilities.

Additionally, Colman and Thompson (2002) found that preschool children with higher levels of maternal attachment security made fewer unnecessary requests for help and fewer statements of inability during puzzle problem-solving tasks. Such behaviours were considered to be reflective of higher levels of self-efficacy.

Security within the mother-child attachment relationship has also shown small positive cross-sectional associations with preschool and kindergarten children's *perceived competence* (S. E. Clark & Symons, 2000; Coplan, Findlay, & Nelson, 2004; Verschueren & Marcoen, 1999), measured using Harter's pictorial scale (Harter & Pike, 1984). Though the effect sizes were similar in all three studies, only one was statistically significant (Coplan et al., 2004). The two statistically non-significant findings may have resulted partly because of the very small samples used (n = 29 and n = 49, compared with n = 127 in Coplan et al., 2004), and because regression analyses were used, despite there being little variance in scores.

A handful of studies have also demonstrated cross-sectional associations between *teacher-child* relationship quality and children's perceived competence and self-efficacy, in children from preschool to second grade (Cugmas, 2007; Stipek et al., 1995; Valeski & Stipek, 2001). For example, 127 first grade children who reported positive feelings about their teachers also reported high levels of perceived competence in mathematics and literacy subjects (Valeski & Stipek, 2001). Though this effect was not found for the 225 kindergarten children in the study, this may have been a result of greater difficulty in comprehending interview questions and procedures, and less realistic self-concepts.

Finally, a prospective association between *classroom-level* teacher support and perceived competence was demonstrated by Perry and colleagues (K. E. Perry et al., 2007) in 154 first grade children. Specifically, children in classrooms that were characterised by more instructionally and emotionally supportive teacher practices at the beginning of the

year reported higher feelings of academic competence at the end of the year, over and above the effects of initial achievement levels.

Collectively, these results suggest that children's relationships with adults, self-concepts, and classroom engagement are interrelated during the preschool and early school years. Furthermore, these results meet all the necessary pre-conditions for the existence of mediated pathways between these variables (see Baron & Kenny, 1986; Shrout & Bolger, 2002). Thus, the Self-Systems Process Model is likely to apply in young children transitioning to school. Nonetheless, these results are not able to provide direct evidence for the model as a whole. To provide stronger empirical support for the usefulness of the model among young children, the associations between all model variables need to be tested within one study.

2.3.5.3 The role of mental health problems within the model.

The mechanisms by which mental health problems and engagement may be related have not been previously considered within the Self Systems Model. However, as previously discussed, several studies have examined the association between mental health problems and other variables in the Self-Systems Model. The findings of these studies provide clues as to where mental health problems may fit within the model. These associations are now briefly reviewed (and displayed graphically in Figure 2.3).

Children's mental health problems and engagement are both predicted by their relationships with their parents and teachers (discussed in section 2.3.4.4.2, and illustrated in Panel A of Figure 2.3). Furthermore, several researchers have demonstrated that processes linking children's relationships to their mental health problems are consistent with the pathways linking relationships and engagement within the Self-Systems Model (illustrated in Panel B of Figure 2.3). Specifically, several cross-sectional and longitudinal studies conducted in adolescents have found that self-reported self-esteem mediates perceptions of social support and mental health problems and well-being (DuBois et al., 2002; DuBois, Felner, Sherman, & Bull, 1994; Yarcheski, Mahon, & Yarcheski, 2001). Especially noteworthy is a study by Kim and Cicchetti (2004), which demonstrated these pathways in 345 7-12 year-old children. When controlling for maltreatment status and

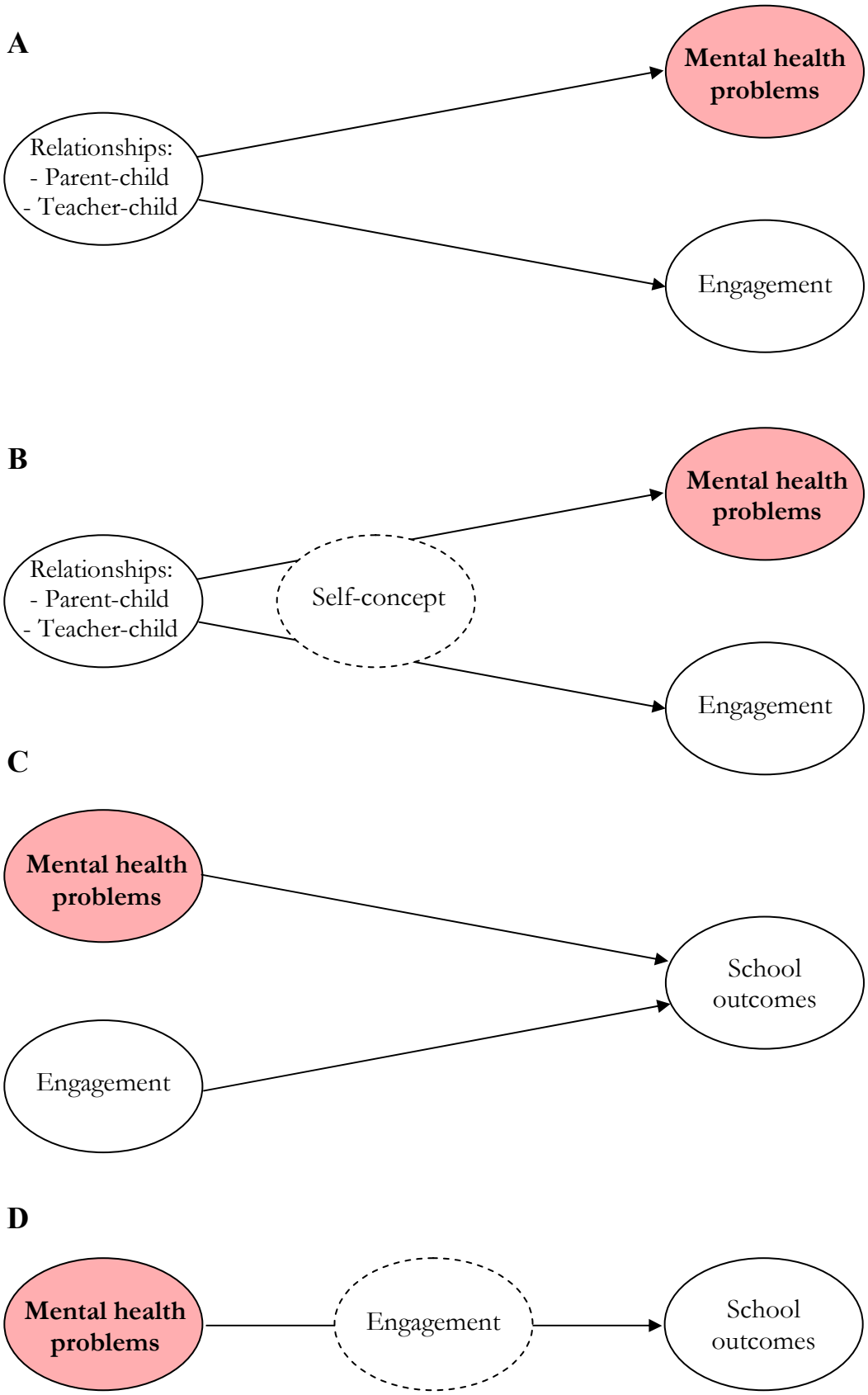


Figure 2.3. Previously documented associations between mental health problems and Self-System Process Model variables. Each Panel refers to pathways found within particular studies, as discussed in section 2.3.5.3.

social competence, mother-child relationship security as reported by the children was indirectly related to the change in both teacher-reported internalising and externalising problems over the year, through children's self-reported self-esteem (J. Kim & Cicchetti, 2004).

Additionally, both mental health problems and engagement are related to academic achievement and other schooling outcomes in the early childhood years (discussed in section 2.3.4.4.2, and illustrated in Panel C of Figure 2.3). Several studies suggest that mental health problems are *indirectly* related to schooling outcomes through motivational variables such as engagement (illustrated in Panel D of Figure 2.3) (Escalon & Greenfield, 2009; McWayne & Cheung, 2009; Normandeau & Guay, 1998; Rapport et al., 2001; Volpe et al., 2006). Furthermore, two of these studies have provided longitudinal evidence for mental health problems as preceding engagement and school outcomes (Escalon & Greenfield, 2009; Normandeau & Guay, 1998).

Considering this evidence, it seems that mental health problems may plausibly fit within the Self-Systems Process Model as the most proximal predictor of children's engagement (see Figure 2.4). Like engagement, mental health problems are also predicted by relationships and self-concept. However, mental health problems may mediate associations between these variables and engagement. Furthermore, engagement may mediate associations between mental health problems and children's achievement, and other educational outcomes.

2.4 A Risk and Resilience Perspective on Classroom Engagement

2.4.1 The negative effects of cumulative risk.

As noted earlier, several social risk factors that are related to low socioeconomic status are negatively associated with children's classroom engagement (Berthelsen & Walker, 2009; Bronson et al., 1995; Entwisle & Alexander, 1993, 1999; Finn & Pannozzo, 2004; Hair et al., 2006; Ladd et al., 1999; McClelland et al., 2000; Reynolds, 1991; Rouse & Fantuzzo, 2009; Smart et al., 2008; Tach & Farkas, 2006). Engagement differences between children experiencing low and high risk levels are present in the first year of school and they increase with time, with at-risk students becoming increasingly

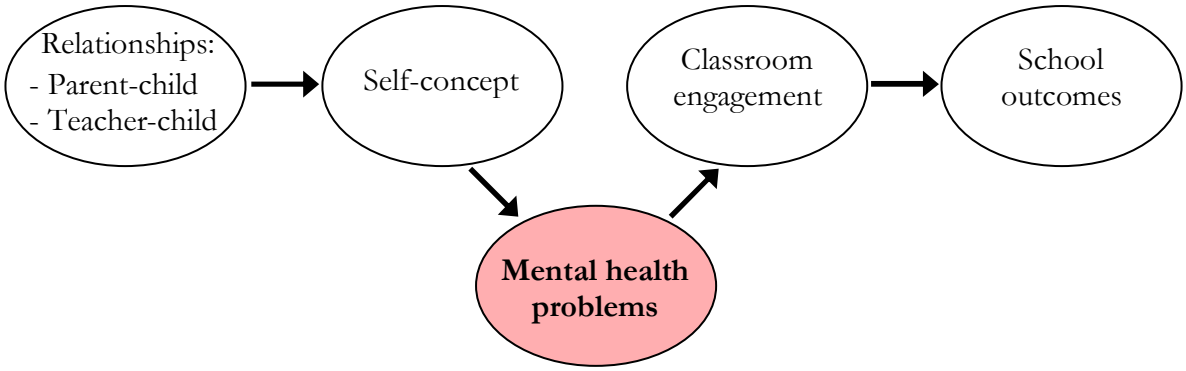


Figure 2.4. The *modified* process model of engagement that is used within this thesis. The variable of mental health problems is shaded red to highlight its role as a new element in the model. Although only fully mediated paths are illustrated for parsimony, the existence of partially mediated paths is not ruled out.

alienated from school, and sometimes eventually dropping out. These social risk factors have a significant pervasive impact on children's development, as they are related to various other outcomes including poorer educational achievement, school dropout, and social-emotional problems (Arnold & Doctoroff, 2003; Bolger, Patterson, Thompson, & Kupersmidt, 1995; Bradley & Corwyn, 2002; Brooks-Gunn & Duncan, 1997; Duncan, Brooks-Gunn, & Klebanov, 1994; Friedman & Chase-Lansdale, 2002; Masten & Gewirtz, 2006; Qi & Kaiser, 2003).

These social risks tend to co-occur, especially in contexts of poverty. For example, teenage mothers are more likely to be single parents, with low levels of family income and social support. These families are more likely to be living in cheap housing located in impoverished urban areas with high crime rates. Unsurprisingly, these circumstances are also associated with higher levels of maternal stress, anxiety and depression (Sameroff, Seifer, Barocas, Zax, & Greenspan, 1987).

Evidence suggests that it is the number rather than the type of risk that has a greater impact on children's developmental outcomes (Rutter, 1979; Sameroff et al., 1987; Sameroff, Siefer, Baldwin, & Baldwin, 1993). Rutter (1979) was among the first to demonstrate this in the seminal Isle of Wight study. He combined six risk factors including overcrowding, low socioeconomic status (SES), marital discord and maternal mental health problems into a cumulative risk index. While the presence of only one risk factor

showed no appreciable increase in the likelihood of childhood behaviour problems, experiencing two risk factors led to a fourfold increase in the probability of problems, whereas four or more risks increased the likelihood of disorder tenfold. Sameroff and his colleagues (Sameroff et al., 1987; Sameroff et al., 1993) found similar cumulative effects of 10 social and behavioural risk factors on children's IQ at age 4 and 13. Compared with Rutter's (1979) multiplicative effects, however, this association was linear: as the number of risk factors increased, children's IQ levels steadily decreased. Cumulative risk explained IQ differences much better than any one risk variable in isolation, and children with the same number but different types of risk factors showed similar IQ levels.

Several researchers have demonstrated the significant negative impact of cumulative risk on young children's classroom engagement (Bronson et al., 1995; Garmezy, Masten, & Tellegen, 1984; S. Judge, 2005; Masten et al., 1990; National Center for Education Statistics, 2001; Rouse & Fantuzzo, 2009). Within the nationally-representative Early Childhood Longitudinal Study – Kindergarten cohort (ECLS-K), teachers reported that 36% of children experiencing two or more risks were "eager to learn" no more than "sometimes" or "never", compared with 20% of children who had not experienced such risks (National Center for Education Statistics, 2001). Additionally, 44% of these 'multiple-risk' children were considered to "sometimes" or "never" "pay attention well", compared with 28% of no-risk children. Finally, 38% of multiple-risk children, compared with 23% of no-risk children, were considered to "rarely" "persist in classroom tasks" (National Center for Education Statistics, 2001). Similarly, Rouse and Fantuzzo (2009) found that regardless of the type of risk that kindergarten children experienced, each additional risk experienced increased the odds of poor learning behaviours by 32%. Thus, children experiencing cumulative risk are likely to have problems engaging in classroom learning activities from the start of formal schooling. This also makes them are more likely to continue on a negative trajectory throughout their years at school (Finn, 1989; Tach & Farkas, 2006). It is these children for whom research into factors that promote engagement is perhaps the most crucial.

However, the negative association between cumulative risk and poorer outcomes is not deterministic: there are great individual differences in children's response to risk, and a significant number of at-risk children manage to do well despite their exposure to high risk. This was documented in the ECLS-K sample, where despite their greater likelihood of poor approaches to learning, the majority of multiple-risk children were seen to have positive approaches to learning (National Center for Education Statistics, 2001). Furthermore, about 1 multiple-risk child in 20 was performing at advanced levels in reading or mathematics (National Center for Education Statistics, 2001).

When reviewing research on risk factors for child psychopathology, Rutter noted that "even with the most severe stressors and the most glaring adversities, it is unusual for more than half of children to succumb" (Rutter, 1985, p. 598). Initially, this 'prediction error' was dismissed as difficult to explain, and of little interest (Masten, 1994; Rutter, 1985). But during the 1970s, researchers began to realise the potential benefits of studying the at-risk children whose outcomes were 'better than expected' (e.g., Anthony, 1974; Garmezy, 1974; Murphy & Moriarty, 1976; Rutter, 1979; Werner & Smith, 1989). From this realisation, the study of resilience was born.

2.4.2 The value of taking a resilience perspective on engagement.

Resilience can be defined as a process of positive adaptation despite experiencing significant risk (Luthar, 2006; Masten, 2001; Rutter, 1990). This two-component definition highlights that resilience is not absolute, but relative, as children's functioning is always judged in relation to the level of risk they experience (Rutter, 1985). Thus, though not 'positive' in and of itself, the absence of psychopathology may well be considered to represent resilience for children of parents with schizophrenia, given that it is better than would be expected (e.g., Garmezy, 1974). Using this definition, considering engagement from a resilience perspective would involve examining engagement that is better than expected given the exposure to the risk being studied (Luthar, 2006).

It is important to note that resilience is a process, involving the interaction between the environment, in terms of its various risks or supports, and the child, who negotiates these conditions (Masten & Garmezy, 1985; Rutter, 1985). Thus resilience is not a static

characteristic or personality trait, and a child's level of resilience may change over time in response to the changing nature of their environment (Luthar, 2006; Rutter, 1985; Werner & Smith, 1989).

Studying resilience enables researchers to identify the factors and processes that help children cope with risk and still function competently (Luthar & Cicchetti, 2000). Taking a resilience perspective in relation to engagement has the potential to facilitate identification of important complementary information for educators and other service providers, as the risk factors for poor engagement are often deep-seated social problems that are very hard to change. Furthermore, it is unrealistic to assume children can be protected from risk forever - at some point in their lives, most children will face some kind of negative experience, such as health problems, family disruptions, or personal or family problems with friends, relatives, or neighbours (Rutter, 1990; Wyman, Sandler, Wolchik, & Nelson, 2000). Thus, it may be more effective to promote factors identified as protective within universal prevention programs rather than attempting to prevent all risks (Doll & Lyon, 1998; Luthar, Sawyer, & Brown, 2006). By focussing on building children's strengths, this approach has the potential to disrupt pathways leading to poor engagement in at-risk children, while also equipping other children with strengths they need to cope with adverse circumstances *before* any such risk is experienced (Luthar, 2006; Rutter, 1990).

Resilience is a derivative of the more traditional 'competence' approach that investigates correlates and predictors of various developmental outcomes (Luthar, 2006). However, examining resilience adds value because it involves studying competence that is 'unexpected', due to the presence of risk. That is, children must have experienced significant risk before they can be considered as showing resilience (Masten, 2001; Rutter, 1990). In comparison, many of the previously-cited studies on correlates of engagement take a competence perspective, given that they investigated relatively healthy populations, and did not account for the experience of risk (Bascoe et al., 2009; Birch & Ladd, 1997; Ladd et al., 1999; Smeekens et al., 2009; Stacks & Oshio, 2009; Sturge-Apple et al., 2008). Unlike research on resilience, research on competence is unable to determine whether the factors identified as associated with good outcomes are also beneficial in at-risk samples. If

the predictors of engagement identified using a competence perspective are only beneficial for children with low levels of risk, then the promotion of these factors within universal prevention programs will not help the highly vulnerable children who have the most to gain, but also, the most to lose, regarding their engagement and later school success (Luthar, 2006; Luthar, Cicchetti, & Becker, 2000).

2.4.3 The definition of protective and promotive factors for resilience.

The purpose of studying resilience is to identify factors that modify or buffer the negative effects of risk factors, and the processes by which this occurs (Luthar, 2006). In other words: what factors help change the trajectories of at-risk children, and steer them towards positive development? Over approximately 40 years, a common set of factors have been consistently implicated in positive adaptation despite risk, across different samples, and various types of risks and outcomes. These factors can be grouped within three broad domains of the family, the community and the child (Luthar, 2006; Masten & Garmezy, 1985; Werner & Smith, 1989). Family factors include close and supportive relationships with at least one parent, secure attachment, authoritative parenting, limit setting and parental expectations. Community factors include positive relationships with role models in the community, such as teachers or religious leaders. Finally, child factors include good cognitive functioning, social skills, an easy temperament, self-regulation, self-esteem, and self-efficacy (Doll & Lyon, 1998; Luthar, 2006; Masten & Coatsworth, 1998; Werner, 2006). It is important to note that these factors are also associated with various aspects of competence – including 'early years' engagement – in low-risk samples (discussed in section 2.3.4, Ladd et al., 1999; Moss & St-Laurent, 2001; Normandeau & Guay, 1998; Rapport et al., 2001; Smeekens et al., 2009; Verschueren & Marcoen, 1999; Verschueren et al., 1996). Thus, it seems that resilience is an ordinary phenomenon that arises from basic but fundamental human adaptive processes. These adaptive processes may help the development of children's competence under both adverse and benign circumstances (Masten, 2001; Werner, 2006).

At this point, it is important to discuss the more specific terms used for resilience-promoting factors: *protective* and *promotive* factors. According to some of the pioneering

researchers in this field, the term 'protective factors' refers to factors that are indirectly related to good outcomes by modifying the negative influence of risk, and thus confer their strongest benefits in the presence of risk (Garmezy et al., 1984; Rutter, 1985). They either have no effect, or a much weaker effect, in low-risk groups. Thus, the effect of protective factors is dependent on risk. These effects are consistent with an interactive (or protection) model of resilience (see Panel A of Figure 2.5), whereby the effects of factors vary at different levels of the risk variable (Garmezy et al., 1984; Masten et al., 1988; Rutter, 1985). However, confusion has arisen within the literature, and many researchers have used this term to refer instead to 'promotive factors', or factors that are directly related to good outcomes in similar ways across all levels of risk (Masten, Cutuli, Herbers, & Reed, 2009; Rutter, 1990). This promotive effect is independent of the impact of risk (Rutter, 1990). Promotive effects are consistent with additive (also known as main effects or compensatory) models of resilience (see Panel B of Figure 2.5), where risks and promotive factors combine additively to influence developmental outcomes, such that enough promotive factors may counteract the negative effects of risk (Luthar & Cicchetti, 2000; Masten et al., 2009; Masten et al., 1988; Rutter, 1985; Sandler, 2001).

The importance and relevance of protective and promotive factors has been a constantly debated issue within resilience research (Luthar & Zelazo, 2003; Masten et al., 2009). Though some researchers argue that only true interactive protective factors indicate resilience (e.g., Garmezy et al., 1984; Rutter, 1985; Rutter, 1990), others feel that as long as a factor helps change the trajectories of at-risk children, in either a protective or promotive manner, then it is helpful to the study of resilience, and can be distinguished from the study of competence (Luthar, 1993; Luthar et al., 2000). This is because such factors can be used in intervention programs designed to improve the developmental outcomes of children experiencing risk (Luthar et al., 2000; Luthar et al., 2006). It is clear that protective and promotive effects are not synonymous, and influence children's positive developmental outcomes through different processes. Ultimately, however, both effects result in similar outcomes. So though both protective and promotive effects are

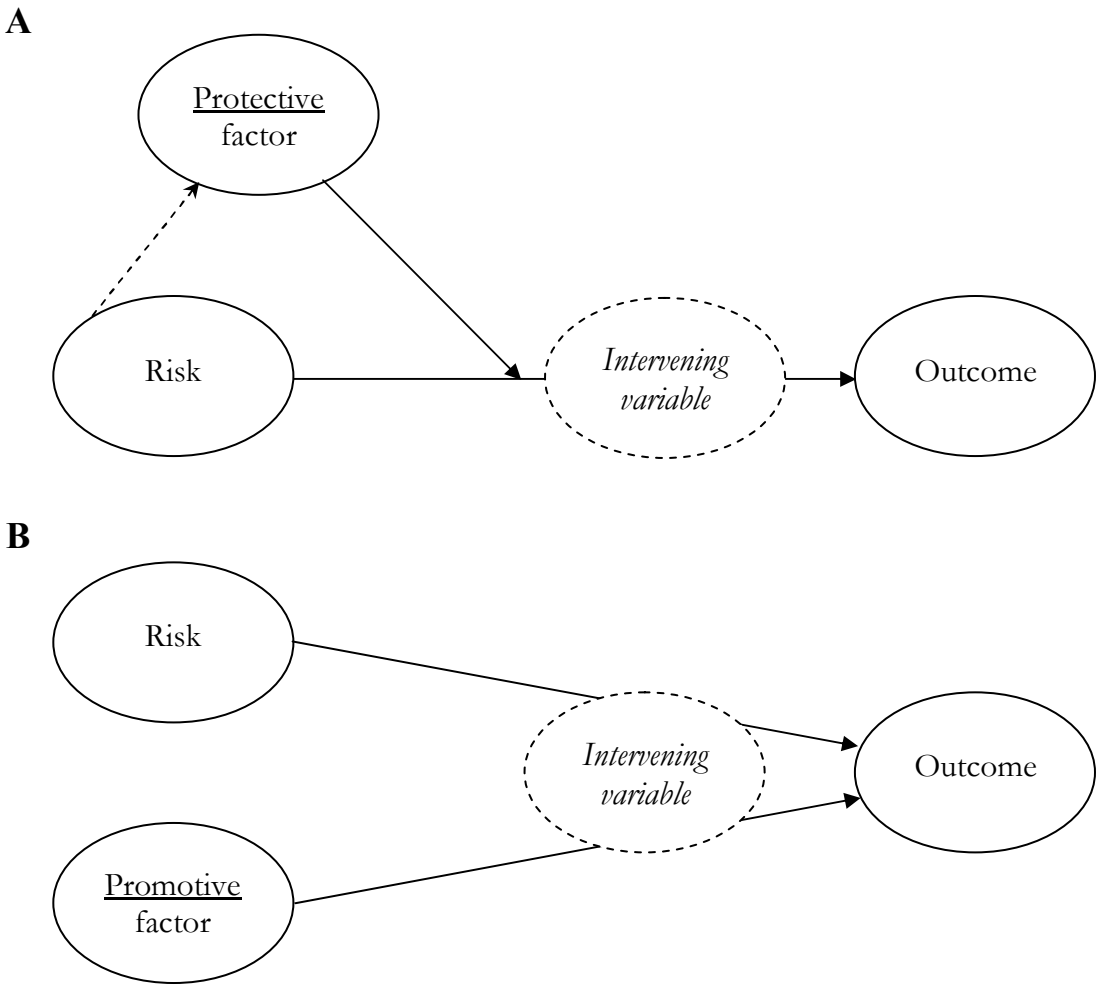


Figure 2.5. Models of resilience (adapted from Masten et al., 2009; Sandler, 2001). Panel A illustrates an interactive model of resilience, whereby the effect of the protective factor on an outcome varies, depending on the level of risk. Panel B illustrates a main effects model of resilience, whereby the promotive factor has a direct effect on an outcome, which is independent of the risk. Both models allow for the protective/promotive factor to influence the outcome directly, or indirectly by first influencing an intervening variable. Also, in Panel A, the dotted arrow indicates that protective factors may arise in response to risk.

important, it is essential to refer to them using clearly differentiated terms (Luthar et al., 2000; Luthar & Cushing, 1999).

2.4.4 Methodological challenges within the study of resilience.

The operationalisation of resilience is a complex and unresolved issue. As mentioned, resilience is never measured directly as a construct, as it is a process involving

the experience of two factors – significant risk, and positive adaptation. Instead, resilience is inferred from the associations between the two (Luthar, 2006; Masten & Powell, 2003). Because of this, there is no universal operationalisation of resilience, leading researchers to measure and define risk, adaptation, and the interplay between them in various ways. This profusion of methods has led some researchers to question the usefulness of resilience as a construct, as the studies that purport to assess it may not be measuring the same phenomenon (Kaplan, 1999; Luthar et al., 2000). For this reason, it is important to discuss the boundaries within which risk, positive adaptation, and resilience may be accurately defined. Ultimately though, decisions regarding definition and measurement are based on conceptual grounds, stemming from consideration of the theoretical and empirical links between the risk and competence variables (Luthar et al., 2000).

2.4.4.1 Measuring risk and positive adaptation.

There are a number of different ways in which the two main components of resilience – significant risk and positive adaptation – can be measured.

Risk can be considered 'significant' if it is statistically associated with poorer outcomes, or carries higher odds for maladjustment (Luthar, 2006; Masten, 2001). As mentioned previously cumulative risk is considered one of the strongest predictors of poorer developmental outcomes, including classroom engagement (Luthar & Cushing, 1999; Rutter, 1979; Sameroff et al., 1987). However, cumulative risk can be measured in two different ways.

First, some researchers use summative indices to combine multiple risks into one variable. This can be done by computing a simple count variable, where risks are scored as present (for example, living in a single parent family, or scoring in the highest quartile of a continuous risk variable) or absent, so that the total score represents the number of risks the child has experienced (Rutter, 1979; Sameroff et al., 1987). Other researchers choose to examine degrees of risk, by retaining the continuous scaling of variables such as parental distress levels, or parenting attitudes. Continuous variables are first standardised prior to summing them to ensure they are all on the same scaling (see Lengua, Bush, Long, Kovacs, & Trancik, 2008; Masten et al., 1990; Obradović, Bush, Stamperdahl, Alder, &

Boyce, 2010; Vanderbilt-Adriance & Shaw, 2008). An advantage of these types of indices is parsimony – as there is only one risk variable to include in regression models, little power is lost from analyses (Burchinal, Roberts, Hooper, & Ziesel, 2000). However, there is likely to be at least moderate overlap in the occurrence and predictive power of the individual risk variables, and thus an index may include the same effect twice (Burchinal et al., 2000; Luthar, 1993). Additionally, this method assumes that all risks have an equal impact on the developmental outcome variable, which is unlikely to be the case. However, the individual impact of each risk variable on the outcome cannot be determined when all variables are combined a single index (Burchinal et al., 2000; Luthar, 1993, 2006).

An alternative approach is to include all individual risk variables simultaneously within regression models (e.g., Baldwin et al., 1993; Borman & Overman, 2004; Burchinal et al., 2000; Kim-Cohen, Moffitt, Caspi, & Taylor, 2004). This approach addresses the limitations of the index approach by examining both the unique impact of each risk variable, as well as the total overall impact of all factors considered together. Thus, this method considers the effects of not only the amount but also the type of risk on the outcome. However, it is important to remember that cumulative risk models arose from the finding that risk factors have a larger effect when they co-occur, rather than uniquely (Rutter, 1979; Sameroff et al., 1987; Sameroff et al., 1993). And as risks often show moderate overlap, the shared variance between them within regression models may be large enough to render all unique effects non-significant. Thus, when using this method, it can be difficult to tease apart unique effects (Burchinal et al., 2000).

Thus, both of these methods have merit, and the goals of the researcher - be they retaining maximum power in analyses, explaining maximum variance in the outcome, or the ability to explore unique effects - will determine which method is better suited to their analyses. Two studies have compared these two approaches in predicting language and social-emotional outcomes in young children (Burchinal et al., 2000; Deater-Deckard, Dodge, Bates, & Petit, 1998). In both studies, the individual risk variables explained a far greater amount of variance in the outcome variables than did the summed risk index. However, no significant unique effects emerged for any of the individual risk variables due

to their moderate intercorrelations. In contrast, the summed risk index was superior in examining change in effects over time, given the analyses retained greater power to explore interaction terms.

Additionally, adaptation can be considered 'positive' if it is 'better than expected' given the level of risk experienced (Luthar, 2006). For example, an absence of psychopathology may well be 'better than expected' for children of parents with schizophrenia (Garmezy, 1974). However, if levels of risk are moderate, it is likely that above average or superior functioning may be needed to meet this definition (Masten et al., 1999). This outcome variable may be treated as continuous, whereby positive adaptation is relative, reflected in higher scale scores. Alternatively, researchers may dichotomise the variable to reflect the presence or absence of positive adaptation. This may be done using predefined scale cutoffs (e.g., clinical cut-points on mental health scales), or on distributional grounds (e.g., median splits, top and bottom thirds, see Luthar, Doernberger, & Zigler, 1993).

2.4.4.2 Conceptualising resilience.

There are two broad approaches to conceptualising resilience: variable-centred and person-centred approaches. Variable-centred approaches examine statistical associations between measures of risk, hypothesised protective/promotive factors, and competence, using regression-based analyses including hierarchical multiple regression and structural equation modelling. In this way, resilience is inferred from the specific pattern of association between the variables. Within such regression models, two types of effects are relevant to resilience. First, if a factor is found to modify (that is, reduce) the negative effects of risk on competence, then it is labelled protective (Garmezy et al., 1984; Rutter, 1987). Researchers typically test such modifying effects using a statistical interaction term between the risk and hypothesised protective variables. However, any statistically significant interaction effects must be explored in more detail to ensure that the positive association between the hypothesised protective and competence variables is stronger in the high-risk children than in the low-risk children (Luthar, 2006; Luthar et al., 2000; Luthar & Cushing, 1999; Masten, 2001; Masten et al., 1988). Second, if a factor shows a

direct positive association with competence over and above the negative effects of risk on competence, then it is labelled as promotive. Such promotive effects are inferred from significant main effects within regression models. (Luthar, 2006; Luthar & Cicchetti, 2000; Masten et al., 2009; Masten et al., 1988).

Variable-based approaches draw on the statistical power of the whole sample, rather than focussing only on groups of children that show extreme patterns of adaptation. Additionally, these analyses more easily lend themselves to the testing of more complex process hypotheses, involving mediation, for example. However, there are two important limitations to this interaction approach. First, the children who are defined as being resilient are never specifically identified, and thus the proportion of children who meet the criteria for resilience remains unknown (Luthar & Cushing, 1999). The second limitation relates to the fact that statistical interaction terms within multiple regression often have low statistical power, and tend to explain small proportions of variance in the outcome variable (Luthar, 1993; Rutter, 1990). Detecting statistically significant effects is less likely under several conditions. Firstly, this can occur when the effect applies only to a small proportion of the sample. This is especially pertinent within resilience analyses as the risk and hypothesised protective factors are likely to be negatively correlated, and thus few people will experience both high risk and high protection (Luthar et al., 2000). Secondly, this is more likely when there is little variation in either the risk or hypothesised protective variables, which may be the case when examining a specific population (Rutter, 2006). Thirdly, the statistical power of the interaction term decreases for each additional variable that is included in the regression equation (Luthar, 2006). Yet it is common for studies to examine multiple hypothesised protective factors for the one outcome variable. For all of these reasons, it becomes more likely that interactive processes actually occurring within the population of interest will not be detected statistically. Any interaction effects that are found significant are then unlikely to replicate across studies, contributing to an inconsistent evidence base overall (Luthar, 1993). Because of this, several leading researchers have cautioned against relying on statistical interaction terms to identify the

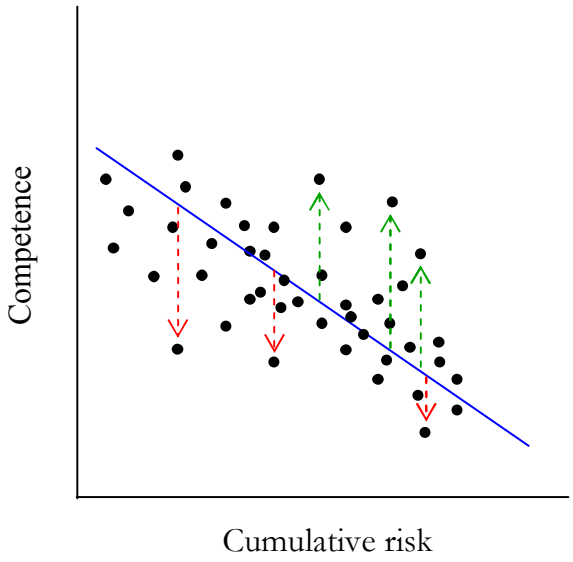


Figure 2.6. The negative association between risk and competence, with a blue regression 'line of best fit'. Resilience residual scores are the difference between an individual's actual competence score, and the score predicted by risk (shown by the regression line). The distance of a data point from the regression line is the degree of resilience/vulnerability. Highly resilient children (with large positive residual scores) are highlighted using green arrows, whereas highly vulnerable children (with large negative residual scores) are highlighted using red arrows.

processes implicated in resilience (Luthar & Cushing, 1999; Masten & Garmezy, 1985; Rutter, 1983, 1987).

Two other variable-centred approaches, used in combination, can address these two main limitations. First, the 'residuals' approach can actually identify the children showing 'better than expected' adaptation despite risk, while keeping all data as continuous (Kim-Cohen et al., 2004; Luthar, 2006). Specifically, when regressing competence on risk, the difference between children's actual outcome score and their outcome score predicted by risk (represented by standardised residual scores) becomes a continuous vulnerability-to-resilience score for each child (see Figure 2.6). As these residual scores represent the deviation in adaptation that is not explained by risk, children with positive residual scores (i.e., falling above the regression line fitted) show 'better than expected' adaptation despite risk, and are considered resilient, to some degree. Conversely, children who score worse than expected based on their predicted score (i.e., a negative residual falling below the regression line) are considered more vulnerable. The size of the residual (i.e., the distance

from the regression line fitted) provides an indication of their level of resilience or vulnerability. Variants of this method have been used in several studies (Baldwin et al., 1993; Borman & Overman, 2004; Elder & Conger, 2000; Hamre, Pianta, Downer, & Mashburn, 2008; Kim-Cohen et al., 2004; Melhuish et al., 2008).

Second, this approach can be used in conjunction with the 'multiple-groups' approach, where main-effects regression analyses predicting resilience residual scores are conducted separately for low- and high-risk groups (as done by Hamre et al., 2008). Subsequent effect sizes and significance levels for each group can then be compared to examine the specificity of processes (i.e., whether a factor is a general 'promotive factor' associated with good outcomes in both low- and high-risk children, or a specific 'protective factor' with a positive influence only for high-risk children) (e.g., Hamre & Pianta, 2001; Ladd & Burgess, 2001; Luthar, D'Avanzo, & Hites, 2003; Owens & Shaw, 2003; Schoon, 2006; Sharkey et al., 2008), while avoiding the statistical limitations related to statistical interaction terms (Luthar, 2006). However, a caveat arises if low- and high-risk groups are identified by reducing initially continuous variables to categorical levels, as valuable information is lost (Luthar & Cushing, 1999). Furthermore, if cut-points are somewhat arbitrarily defined without a solid reason to suspect different effects occurring on either side of the cut-point, then they may possibly obscure any actual effects that occur within and not between these created groups (Fergusson & Lynskey, 1996).

In contrast to these variable-centred approaches, person-centred resilience approaches typically involve identifying a group of 'Resilient' children (who have high levels of risk but high competence), and comparing it with other groups of children showing different patterns of risk and competence. The groups' mean levels of hypothesised protective/promotive factors are compared statistically using *t*-tests, MANOVAs, or discriminant function analyses (DFAs). The specific groups of children that are compared each reveal different information regarding the nature of resilience.

Early person-centred studies compared only two groups of children: high-risk children identified as either 'Resilient' (showing high competence) or 'Vulnerable' (showing low competence) (Cowen, Wyman, Work, & Parker, 1990; Werner & Smith,

1989). By comparing levels of factors between these two groups of children, one could determine whether greater levels of these factors are related to higher competence levels in at-risk children. However, such analyses are limited because they cannot determine whether factors that differentiate the two groups are truly protective, conferring unique benefits for high-risk children only, or whether they promote good outcomes similarly across all levels of risk. Groups of low-risk children must be included to address this question.

Later studies attempted to address this issue by recruiting children from community populations that varied widely in their exposure to risk. Researchers then identified four groups of children: the high-risk (1) 'Resilient' (high competence) and (2) 'Vulnerable' (low competence) groups discussed above, but also two low-risk groups with divergent outcomes, the (3) 'Competent' (high competence) and (4) 'Under-achieving' (low competence) groups (termed 'Full Diagnostic Models' by Masten and colleagues (2009), see Figure 2.7).[5] If the 'Resilient' and 'Vulnerable' children experience different levels of a hypothesised protective factor, but the 'Competent' and 'Under-achieving' children do not, this factor could be considered truly protective, given it only affects competence levels in high-risk children. However, several of these studies did not find enough children within the 'Under-achieving' group to include them in analyses, precluding the examination of specificity of effects across risk groups (Dumont & Provost, 1999; Leontopoulou, 2006; Luthar et al., 1993; Masten et al., 1999). This is at least partly a definitional issue, as studies that find this 'empty cell' phenomenon generally use quite stringent definitions of low risk and/or low competence, making it harder for children to fall into this category. In contrast, studies that identify a significant number of 'Under-achieving' children have more relaxed cut-offs (D'Imperio, Dubow, & Ippolito, 2000; Hamill, 2003; Herman-Stahl & Petersen, 1996; Schoon, 2006; Thomas, 2007; Zucker, Wong, Puttler, & Fitzgerald, 2003). Another interesting comparison possible within these studies is between the 'Resilient' and 'Competent' children. These comparisons can examine whether children in the 'Resilient' group need higher levels of the hypothesised

[5] The names given to the three comparison groups often vary between studies. However, the labels I have used here are common to several studies.

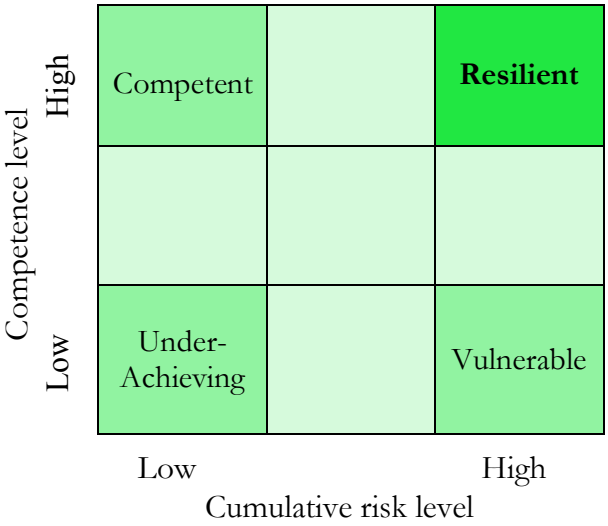


Figure 2.7. The identification of four groups of children within person-centred resilience research, based on Masten and colleagues' Full Diagnostic Model of resilience (2009). Blank categories reflect intermediate scores on risk, competence, or both.

protective/promotive factors to overcome the negative effects of risk and reach the same level of competence as their low-risk counterparts (i.e., children in the 'Competent' group, see Figure 2.7).

There are several advantages of the person-centred approach. Resilience is examined as it occurs naturally within the child, rather than through associations between variables. Due to this, resilient children can be identified (Masten et al., 2009). Additionally, examining profiles of adaptation provides a clearer understanding of resilience than do significant regression interaction effects, which are ambiguous at first glance (Schoon, 2006). However, person-centred analyses can be significantly limited in the same way as multiple-groups analyses if categorical groups are created from initially continuous variables. Specifically, valuable information may be lost, such as actual effects that occur *within* rather than *between* created groups. There may also be a considerable reduction in sample size and perhaps power if researchers choose to only examine extreme groups, and exclude the children from intermediate groups (refer to Figure 2.7). Additionally, given that creating cut-points in continuous variables (and thus the definition of resilience) is often quite arbitrary, person-centred approaches can result in considerable

methodological variability *between* studies. This means that results may be less likely to be replicated, and may not be directly comparable between studies (i.e., reliable) (Kinard, 1998; Luthar & Cushing, 1999). Thus, results of person-centred approaches may not be easily synthesised to form a coherent picture of resilient children.

Despite this substantial methodological variation, these variable-centred and person-centred methods consistently identify the same core set of factors as associated with resilience, suggesting that these factors are all implicated in the same underlying phenomenon, and support the validity of resilience as a construct (Luthar et al., 2000; Masten et al., 2009). However, it may be useful to use both variable- and person-centred approaches in combination, given their relative strengths and weaknesses. Luthar and Cushing suggested that "in instances where variable-based analyses are essential due to the continuous nature of measures… qualitative analyses of exemplar resilient individuals can be a valuable addition" (Luthar & Cushing, 1999, p. 150). To date, few researchers have examined whether similar variables emerge as significant when employing multiple resilience methodologies within the same sample. Thus, little information exists regarding how different statistical approaches affect results when holding constant the sample and measures of risk, protection, and competence.

Masten and colleagues (1999) conducted both variable-centred analyses (examining whether parenting and cognitive functioning variables buffered the negative impact of risk using regression interactions), and person-centred analyses (examining whether the same variables distinguished between 'Resilient', 'Vulnerable' and 'Well-adjusted' groups of children in MANOVA) on 205 elementary school children (see also Leontopoulou, 2006; Masten et al., 2004). However, without a fourth 'Under-Achieving' group (low risk/low competence), the possibility that the associations between the parenting/cognitive functioning variables and competence differed between high-risk and low-risk children could not be examined. Thus, while complementary, their variable- and person-centred approaches were not directly comparable. Two studies that assessed only high-risk (e.g., domestic violence, multiple risks) children used regression models for both variable-centred analyses (i.e., linear regression, treating the outcome variable as continuous) and

person-centred analyses (i.e., logistic regression, with the outcome variable scored to indicate resilience or vulnerability) (Buckner, Mezzacappa, & Beardslee, 2003; Obradović, 2010). Unsurprisingly, these highly similar methods yielded concordant results. But like Masten and colleagues (1999), these researchers could not examine whether the competence-promoting factors would also show similar effects in low-risk samples.

Only one study has attempted to assess interactive effects using both variable- and person centred analyses in the same sample. In a sample of 101 third – fifth grade students, Lengua (2002) examined whether levels of self-regulation variables discriminated not only between two high-risk groups (e.g., 'Resilient' vs. 'Vulnerable'), but also between two low-risk groups (e.g., 'Well-Adjusted' vs. 'Under-Achieving'), using logistic regressions. Findings were then compared with those from linear regression interaction terms. However, these methodologies were not completely comparable, because while several outcome variables were examined separately within variable-centred analyses, they were combined into a composite outcome score for person-centred analyses. The variables that showed interactive effects differed between the two approaches, highlighting the importance of using complementary approaches within resilience research. However, results may have differed between analyses purely as a result of using slightly different outcome variables.

Thus, it appears that no resilience study has examined the existence of both protective and promotive factors and processes within completely comparable variable-centred and person-centred analyses. As these approaches ask slightly different questions, results may yield different insights, and provide a more holistic view of resilience. And as these methods have different degrees of statistical power, subsequent results comparison may distinguish the true effects from those that arise as an artefact of the particular methodology used.

2.4.5 Key protective and promotive factors.

Several seminal longitudinal resilience studies with long-term follow-up provide evidence of the importance of the key resilience factors of parent-child and teacher-child

relationships and children's self-concept (as both protective *and* promotive) for various developmental outcomes.

The first longitudinal study of resilience was the Kauai Longitudinal Study (Werner & Smith, 1989, 1992). Among the entire 1955 birth cohort on the island of Kauai, Hawaii (n = 698), 30% of children were identified as high-risk; these children had experienced four or more risks before the age of two, such as chronic poverty, a disorganised family environment, low parental education, and parental alcoholism or mental health problems. Approximately one-third of these high-risk children were classified as resilient, as they showed good adaptation and an absence of mental health and learning problems in later childhood and adolescence. Compared with their more vulnerable peers, the resilient children were more self-confident and independent during early childhood, but had the ability to ask for help when needed. During middle childhood, the resilient children had a special hobby or interest that provided them with a sense of competence and pride, and they believed that they were capable of positively influencing their environment. In adolescence, the resilient children displayed positive self-esteem and self-efficacy. Additionally, the resilient children had formed a close and supportive bond with at least one caregiver. And during the school years, all of the resilient children had a favourite teacher who acted as a role model and a source of support (Werner & Smith, 1989).

Furthermore, subsidiary analyses that included a low-risk comparison group revealed that both positive parent-child relationships and emotional support provided by other family members during early and middle childhood were protective, discriminating between positive and negative outcomes only in the children from backgrounds of poverty and stressful life events. These particular factors did not make a difference in the lives of more advantaged and stress-free children (Werner, 2006; Werner & Smith, 1989).

Rutter and Quinton (1984) examined the parenting skills of institution-reared girls. Despite their high risk for poor parenting skills, a significant number of these girls demonstrated good parenting. They appeared to show such unexpected positive outcomes because of several chain reactions earlier in life. The chain reactions started when positive school experiences, where children experienced success in any one area, were associated

with pleasure in mastery, and increased self-efficacy and planfulness. With higher planfulness, the girls were able to avoid associating with deviant peer groups, and also chose to marry a supportive spouse, rather than enter into an unsupportive and conflicted marriage that often ended in separation. It was this presence of a supportive spouse that accounted for the good parenting skills of these girls. Of note, the associations between all of these variables were much weaker in the control group (and thus acted in a *protective* manner). Rutter (1990) speculated that this was because the low-risk children had already experienced success and reward from within their family, so positive school experiences merely reinforced self-efficacy, rather than creating it. Additionally, the low-risk children did not need to exercise planning in choosing to marry a supportive spouse, as they were already surrounded by supportive and well-functioning peers and colleagues. Thus, they were more likely to marry a supportive husband simply by chance.

Norman Garmezy and Anne Masten's Project Competence (Garmezy et al., 1984; Masten, 1994; Masten et al., 1988; Masten et al., 1999; Masten et al., 1990) followed a normative school cohort of 205 third-sixth grade children into adulthood, up to 20 years later. Experiencing a greater number of stressful life events across childhood was associated with both lower child and adolescent competence in spheres of academic achievement, classroom engagement, conduct and mental health problems. However, over and above the effects of risk, parenting had consistent additive benefits for each domain of competence. Furthermore, parenting quality emerged as protective for the externalising competence domains (including conduct problems and disruptiveness). This resembled a steeling effect, whereby high levels of parenting quality helped children maintain below-average levels of externalising problems with increasing levels of risk, whereas children without such protection exhibited escalating externalising problems (Masten et al., 1988; Masten et al., 1999).

Finally, the Rochester Child Resilience Project studied outcomes in highly-stressed and impoverished second to sixth grade urban children, and followed them into adulthood (Cowen et al., 1997; Cowen et al., 1990; Hoyt-Meyers et al., 1995; Wyman, 2003; Wyman et al., 1999). These children had experienced multiple adverse events including parental

conflict separation and substance abuse, family violence, and poverty. Children were classed as 'Stress-Resilient' if they demonstrated high levels of social, academic and behavioural competence. Among the variables found to distinguish these 'Stress-Resilient' children from their 'Stress-Affected' peers (who showed low levels of competence), those with the most consistent and marked effects included self-reported self-esteem and self-efficacy, and children's positive perceptions of their mothers and family situations, which the 'Stress-Resilient' children experienced to a greater degree. Furthermore, parents of the 'Stress-Resilient' children reported having a high quality relationship with them, characterised by emotional responsiveness, nurturant involvement, and openness. However, without including low-risk groups as comparisons, it could not be determined if these factors were truly protective, conferring greater benefits in highly-stressed children. Regardless of this, these factors were important for helping at-risk children 'beat the odds' and show good developmental outcomes.

2.4.5.1 The centrality of relationships.

Converging evidence from these and other studies has led researchers to conclude that "relationships lie at the roots of resilience" (Luthar & Brown, 2007, p. 947). The experience of a close and supportive relationship with at least one adult consistently emerges as the strongest predictor of resilience, across diverse samples, and various adversities as devastating as war, terrorism, and homelessness (Luthar et al., 2000; Masten & Coatsworth, 1998; Rutter, 1990). Research on intervention programs also pinpoints adult-child relationships as the most effective candidates for changing at-risk children's trajectories (Masten & Obradović, 2006; Raver, 2002; Webster-Stratton & Taylor, 2001).

Parent-child relationships are considered as the most influential for children's resilience, partly because they are the earliest, most enduring, and physically proximal source of socialisation and support in children's lives (Luthar, 2006; Masten & Gewirtz, 2006). Due to their proximity, parents are able to physically remove children from risky environments involving parental conflict, violence, or drug use. They are also perhaps the best suited to explain the occurrence of family adversities to the child, and help them deal with them emotionally (Masten, 1994). However, as adverse experiences during early

childhood most often occur in children's immediate family environment, parents are likely to experience many of the risks facing their child, and thus are vulnerable to suffering decrements in their warmth and responsiveness (Masten et al., 1999). And children who experience high levels of socio-economic or psychosocial risk coupled with low levels of parent support have an extremely high probability of poor outcomes (Masten, 2001; Masten & Coatsworth, 1998).

Alternatively, supportive relationships with adults outside of the immediate family, such as teachers, are also important in fostering resilience. Teacher relationships may be especially pertinent if parents are struggling to deal with family problems and are unable to provide children with appropriate levels of support and protection (Luthar, 2006; Luthar & Zelazo, 2003; Masten & Coatsworth, 1998). Simmons and Blyth (1987) theorised that as long as children experience at least one relationship or context that provides them with positive emotional support, and in which they can feel relaxed and comfortable (termed an 'arena of comfort'), then they can cope with stressful experiences in other areas. Furthermore, several leading researchers have postulated that good relationships with other adults may compensate for poor relationships with parents (Luthar, 2006; Masten & Coatsworth, 1998; Rutter, 2000; Werner, 1993; Werner & Smith, 1989). However, little empirical research has tested these claims. This omission is surprising, given the emphasis on relationships, and on the interplay between child, family and environmental factors, within the existing research.

Two studies have shown supportive teacher practices to have compensatory roles within at-risk samples, showing stronger associations with children's outcomes when parental support is low. Brody and colleagues (2002) studied a sample of 277 impoverished African American children and adolescents from single parent families. In the children who also experienced the 'dual risk' of low maternal warmth and support, levels of self-regulation were higher, and levels of externalising problems and depression were lower in those who perceived their teachers to be highly supportive. However, among children with high levels of parent support, outcomes did not differ as a function of teacher support. A similar effect was seen among a sample of 104 impoverished Latino

adolescents, whereby teacher-child relationships had a larger effect on their self-reported competence when they reported parent-child relationship quality to be low (Murray, 2009).

Additionally, several studies have found compensatory effects for the school outcomes of more highly-functioning community samples. Specifically, teacher-child relationship quality showed stronger positive associations with children and adolescents' classroom engagement, reading ability and achievement when mother-child relationship quality was low (Burchinal, Peisner-Feinberg, Pianta, & Howes, 2002; Furrer & Skinner, 2003; O'Connor & McCartney, 2007; Sharkey et al., 2008).

However, an equal number of studies have failed to find such interactive effects. These studies assessed various outcomes, including externalising behaviours, classroom engagement, social skills, and shy or anxious behaviour, in both children in the first few years of school, and adolescents. In all cases, teacher-child relationship quality was not more beneficial for the children's development when their parent-child relationship quality was low (J. N. Hughes, Cavell, & Jackson, 1999; Meehan, Hughes, & Cavell, 2003; Mitchell-Copeland, Denham, & DeMulder, 1997; Pianta et al., 1997; Silver, Measelle, Armstrong, & Essex, 2005; Wentzel, 1998). In these studies, parent and teacher relationships were generally found to exert unique and independent effects. Thus, overall the small evidence base is equivocal as to whether teachers can truly compensate for negative relationships at home.

The mixed findings of these studies are likely due, in a large part, to methodological and sample differences. Across these studies, the specific aspects of the parent-child and teacher-child relationship that were examined varied, as did the outcome variables investigated. Also, the methods by which researchers tested the interactive or compensatory nature of teacher-child relationships differed markedly, especially in terms of their statistical power to detect such interactive effects. Relatedly, the large sample size differences between studies would have led to power differences. In fact, all of studies assessing samples with over 1000 participants found statistically significant interactive effects (Burchinal et al., 2002; O'Connor & McCartney, 2007; Sharkey et al., 2008).

Finally, the changing functions of parent and teacher relationships as children age may influence how these relationships work in conjunction, leading to different results at different developmental stages (Lynch & Cicchetti, 1997). For instance, teacher-child relationships are likely to serve similar functions to parent-child relationships in the preschool and kindergarten years. At this age, children are still quite dependent on adults for guidance and emotional support, and the role of 'teacher' as differentiated from 'caregiver' may not be completely realised while they are still new to school environments (Hamre & Pianta, 2001). At older ages, teachers primarily provide academic support to students, and thus have more differentiated roles from parents. Rutter (2000) postulated that for one relationship to be able to compensate for another, it must provide a similar type of support. Thus, as roles of parents and teachers are more similar during the early childhood years, the relational support provided by teachers may be able to compensate for an absence of parent support in this age group.

All evidence considered, the compensatory nature of teacher-child relationships may differ as a function of factors inherent within each study, and thus must be tested in each sample of interest before recommendations for interventions can be made.

2.4.6 A resilience perspective on early engagement: Evidence of associated protective and promotive factors.

A few studies have found statistically significant associations between parent-child and teacher-child relationships, children's self concept and mental health problems and their resilient classroom engagement in the early school years.

Ladd and Burgess (2001) found that teacher-child relationship quality assessed at the beginning of kindergarten acted as a promotive factor for children's classroom engagement at the end of first grade, since associations between these variables were similar for both low- and high-risk children (who differed in terms of their socioeconomic status and ethnicity). Two studies identified teacher-child relationship quality as implicated in resilient classroom engagement within at-risk samples. First, Luo and colleagues (2009) identified several distinct developmental profiles in poor, academically at-risk and largely ethnic minority first grade children. The group of children with the most 'resilient' profile,

who were characterised by the highest levels of classroom engagement, also showed the highest levels of teacher support. Second, Murray and colleagues (2008) tested associations between teacher-child relationships and emotional engagement with schooling in a sample of low-income, urban and largely ethnic minority kindergarten children. Overall, closeness, conflict and dependency within the teacher-child relationship were related to school liking and school avoidance in this at-risk sample. Furthermore, some of these associations were stronger in the ethnic minority children: the negative associations between teacher-child conflict and school liking were stronger for the African American than for the European American children, and the negative associations between teacher-child dependence and school avoidance were stronger for the Hispanic American than for the European American children. These results suggested that despite their at-risk status, these ethnic minority children had more to gain from the protective aspects of teacher-child relationship quality.

The previously discussed studies that identified teacher-child relationship quality as associated with impoverished children's classroom engagement (e.g., Pianta et al., 1995, see Section 2.3.4.2) also provide evidence that teacher-child relationship quality can help change the motivational trajectories of at-risk children. However, they were not able to specifically identify it as protective, or promotive, without a low-risk reference sample. Finally, Downer and colleagues (2007) demonstrated that a positive classroom climate fostered by teachers is protective for the classroom engagement of disadvantaged third grade students. Specifically, children with a high number of cumulative educational risk factors (such as underachievement and behavioural issues) were able to benefit more from positive classroom climate in terms of their engagement than were their low-risk peers.

Less evidence is available to suggest that parent-child relationships buffer the effect of risk on children's classroom engagement in the early school years. However, parent-child relationships characterised by warmth, closeness and openness have shown similar small positive associations with classroom engagement in socio-economically and academically at-risk samples of preschool and kindergarten children (Pianta et al., 1997; Turner & Johnson, 2003). Masten and colleagues (1988) examined parenting as a

protective factor against stressful life events in a normative sample of third to sixth grade children. Parenting quality had an overall small to moderate promotive effect on the engagement of children, regardless of the number of stressful life events experienced. There was also a significant interaction between parenting quality and stressful life events, but this revealed what is termed a 'vulnerability' effect (Luthar et al., 2000; Masten et al., 1988), where parenting quality was only beneficial for children experiencing low to average levels of stressful life events. At high levels of stress, there was no association between parenting quality and engagement, with children high on parenting quality showing similar levels of engagement to those who were low on parenting quality (Masten et al., 1988).

A small number of studies have demonstrated the benefits of positive self-concept to at-risk young children's classroom engagement. The three previously-mentioned studies that showed small links between child-reported perceived competence and teacher-reported engagement (see section 2.3.4.3) were all conducted in samples of at-risk children (J. N. Hughes & Zhang, 2007; Luo et al., 2009; Valeski & Stipek, 2001). For example, in Luo and colleagues' (2009) study of poor and academically at-risk first grade children discussed previously within this section, there were small positive associations between teacher-reported classroom engagement and children's self-reported academic self-efficacy beliefs. Furthermore, children with the most 'resilient' profile of engagement also reported the highest levels of perceived ability following a difficult puzzle task. Without a group of low-risk children to serve as a comparison, it cannot be determined whether perceived competence acted in a protective or promotive capacity.

Of special import to this thesis, several studies have identified aspects of mental health as positively associated with young children's engagement in the context of risk. Studies have found negative links between classroom engagement and aspects of both externalising problems, including conduct problems and disruptive, aggressive, and hyperactive behaviour, and internalising problems, including withdrawn behaviour, in impoverished and academically at-risk children from preschool to fifth grade (Baker et al., 2009; Baker et al., 2008; Bulotsky-Shearer et al., 2010; J. N. Hughes & Kwok, 2006; Luo et al., 2009; McWayne & Cheung, 2009; McWayne et al., 2004). It is unknown whether lower

levels of these externalising problems would also have been equally beneficial for low-risk children. Additionally, Judge (2005) demonstrated the promotive effects of positive mental health on the classroom engagement of 13,965 kindergarten children enrolled in the ECLS-K study, in the context of their levels of cumulative family risk (such as single parenthood, low maternal education, and low socioeconomic status). This study was consistent with a main effects resilience model, as mental health worked independently of risk to counteract its effects; that is, over and above the negative effects of cumulative risk, and while controlling for gender, age, and interpersonal skills, both internalising and externalising problems showed small but significant negative associations with children's classroom engagement. This would suggest that better mental health may work to counteract the effect of risk on engagement. However, as these associations were not examined for low- and high-risk groups separately, it could not be determined whether higher levels of mental health benefited these groups equally (therefore acting in a promotive manner), nor could the possibility that larger benefits may have been afforded to the high-risk children (i.e., protective effects) be explored.

Given this small collection of evidence, it is possible that good quality parent-child and teacher-child relationships, and positive self-concept and mental health may help change the trajectories of at-risk preschool children and lead to better than expected classroom engagement during the early school years. However, it is unclear as to whether these factors would predominantly act as protective or promotive. In any case, at-risk children may benefit from the promotion of these factors, at least equally if not more than low-risk children.

2.4.7 Theoretical considerations: The process of resilience.

Following almost five decades of research into the phenomenon of resilience, the core list of protective/promotive factors has been confirmed, refined, and added to, and applied to various under-studied populations. Now that these factors are well-established, however, it is essential that research moves away from simply adding to this list, and instead focuses on the processes by which these factors exert their beneficial effects (Luthar & Brown, 2007; Rutter, 2000). This greater level of detail is needed to determine

where funding and resources should be focused within intervention programs. Certain protective factors may have a greater impact on resilience, not only through direct promotion, but also by generating a number of other protective factors. It would be more economical to prioritise the promotion of these types of factors within interventions, given that they may mobilise other protective factors, and provide cumulative protection to counteract cumulative risk (Luthar & Brown, 2007). For these reasons, researchers have been calling for an attention to resilience mechanisms and processes over the past 20 years (e.g., Coie et al., 1993; Egeland, Carlson, & Sroufe, 1993; Friedman & Chase-Lansdale, 2002; Luthar, 1993; Luthar et al., 2000; Masten, 1994; Masten et al., 1990; Rutter, 1990; Sandler, 2001; Sandler, Miller, Short, & Wolchik, 1989). However, few researchers have actually attempted this, providing only a small and disparate evidence base (Luthar & Brown, 2007; Masten et al., 2009; Rutter, 2007).

Relatedly, a unified theoretical framework that illuminates the mechanisms and processes of resilience has also been lacking. Several studies have been guided by broad ecological and transactional developmental frameworks (e.g., Bronfenbrenner, 1979; Sameroff & Chandler, 1975), which conceptualise resilience as a result of continuous transactions between the child, the caregiving environment, and the broader community, in order to break the linkage between the experience of risk and later disorder. These frameworks are useful inasmuch as they have led researchers to consider protective factors from family, community, and child domains within the same study. But as a result of their broad base, these "guiding perspectives" (Luthar et al., 2000, p. 552) do not identify any clear psychological mechanisms of exactly how factors from these domains might be associated. Thus, testable hypotheses are not easily generated from these frameworks (Harvey & Delfabbro, 2004).

Instead, researchers stress the need to use theories that address the mediating and moderating processes by which more distal factors are related to resilience (Luthar et al., 2000). Given that adult-child relationships are universally important for the development of resilience, it is important to examine the processes by which they do this, including those which generate other factors (Luthar & Brown, 2007; Rutter, 1987, 1990). There are

several resilience theories which specify that good quality relationships exert their protective effects through the promotion of internal child strengths.

Rutter (1987) was one of the first researchers to propose several specific mediating mechanisms by which children's relationships with parents and teachers might influence resilience. These processes may involve a reduction of the risk exposure by, for example, strict parental supervision of children living in violent neighbourhoods. Alternatively, these processes may change the meaning of the risk, as, for example, when parents encourage children to reframe a negative event in a positive or non-threatening light. Additionally, protection may lie in the reduction of negative chain reactions stemming from the initial risk. For example, a high likelihood of depression and other psychological problems is present in parentally bereaved children, due to the loss of affectionate care and routine from both parents (the deceased and the grieving). However, if the remaining parent is able to continue to function adequately and ensure the continuity of care and routine, then the continuation of risk may be ameliorated. Furthermore, protective factors may open up opportunities. When disadvantaged children start school, a supportive teacher who recognises and works with their strengths may increase their access to educational experiences and resources, generate feelings of self-efficacy, and help them see themselves as learners for the first time.

Lastly, and of particular relevance to the variables discussed in this thesis, Rutter (1987) postulated that protection could arise through the promotion of children's positive self-concepts, including self-esteem and self-efficacy. Children's beliefs that they are loved, worthwhile, and competent influence how they interpret events within their immediate environment, and their ability to cope with potential threats identified within it. Rutter suggested that positive self-concepts were fostered by two factors: secure and harmonious relationships with parents and other social supports, and success at completing tasks (which may be facilitated by adult support and scaffolding).

Several other theories implicate self-esteem and self-efficacy as important mediating variables through which relationships promote resilience (e.g., Sandler, 2001; Sandler et al., 1989; Skinner & Wellborn, 1994; Skinner & Wellborn, 1997). These

researchers consider children's self-concepts as an integral part of their ability to cope with stress and develop resilience. Several themes are common to these models. First, risks or adverse experiences are thought to lead to poor adaptation and disorder by threatening children's basic needs, and preventing them from reaching desired goals. Specifically, adverse experiences are often characterised by chaos, lack of control, inconsistency, unpredictability, disorganisation, poor stimulation, and neglect, and these negative aspects threaten children's needs of feeling loved, worthwhile, competent, and in control. However support from various sources, such as parents and teachers, may counteract these negatives and promote resilience by fulfilling these same psychological needs and thus improving children's self-concepts. When children's self-concepts are characterised by high levels of competence and worth, then in times of stress, they are more likely to actively seek help from adults, as they see them as supportive and responsive, and they are more likely to feel able to gather information, control aspects of their environment, and problem-solve. All of these coping strategies promote good developmental outcomes during times of stress.

There are several potential mechanisms through which children's relationships with parents and teachers may improve self-concept and resilience. Firstly, supportive relationships may influence self-concept independent of the experience of risk, and as such may also do this prior to any risk occurring. In this way, relationships would work in an additive manner, counteracting the effects of adverse experiences by equipping children with the means to cope (Sandler et al., 1989; Skinner & Wellborn, 1994). Secondly, supportive relationships may increase resilience in response to the risk experience, thus functioning in an interactive manner (Masten et al., 2009). This buffering effect may occur by reducing or reframing risk, for example by increasing attention, support, or maintaining routine following the birth of a new sibling, or helping children to interpret the risk in a non-threatening manner. Additionally, relationships may influence children's beliefs that they have the resources to cope with the risk. In many instances, the process of protection may well involve a combination of additive and interactive effects.

Within these theories, it can be seen that the associations between children's parent-child and teacher-child relationships, self-concept and developmental outcomes are similar to those specified within some theories of competence, such as the Self-Systems Model of Engagement. In fact, Skinner and Wellborn's (1994; 1997) model of coping and resilience in the academic domain was synthesised from both the literature on coping and the Self-Systems Model, and as such considers sustained engagement as the initial outcome of successfully coping with stress. However, these resilience theories can be differentiated from competence models because they consider these processes as a response to the experience of risk. Although similar chain reactions occur in both competence and resilience theory, they occur in response to different circumstances.

These theories also have roots in attachment theory, which details how attachment relates to how children interpret, respond to and cope with stress (Bowlby, 1969/1982). A central tenet of attachment theory is that children's internal attachment systems balance their dual needs of exploration and protection from stress (Cassidy, 1999). In benign circumstances, children's exploratory drive prevails. However, in times of danger or stress, children's attachment systems are activated. This is when individual differences in attachment quality are most readily apparent (Bretherton, 1985). Variations in attachment influence children's appraisals of, and reactions to stress. As children with positive internal working models perceive their environment as supportive, they are less likely to interpret events as threatening to begin with (Sroufe, Carlson, Levy, & Egeland, 1999). However, when stressed, children with secure attachment representations (perceiving their caregiver as likely to provide support in times of need) will also actively seek out their attachment figure for comfort. They are able to derive comfort from them, and can subsequently resume exploration and engagement. In short, securely attached children recover easily following stressful situations (Sroufe & Waters, 1977). Conversely, children with insecure attachments may fail to seek support from parents, as they do not expect them to help, or alternatively are unable to be comforted by them, which delays them returning to exploration (Sroufe et al., 1999; Weinfield et al., 1999).Thus, under conditions of stress,

children with insecure attachments may freeze, become overly anxious, angry or hostile, and withdraw from exploring the environment (Bretherton, 1985; Sroufe et al., 1999).

Given their long-standing prominence in the literature, it is surprising that these particular hypotheses have not been subject to much empirical testing. Few studies have investigated the possible mediating role of children's self-concept in the association between adult-child relationships and resilience. However, the existing evidence generally supports this mediating hypothesis. Most of these studies have examined at-risk samples, rather than examining varying levels of risk within the sample, enabling a low-risk comparison. Furthermore, no study has tested these hypotheses in the early childhood years.

Several studies by Irwin Sandler and his group have found that self-concept variables mediate associations between parent-child relationship quality and mental health outcomes in children experiencing parental death or divorce. For example, cross-sectional analyses showed coping efficacy to partially mediate the association between warm and responsive parent-child relationships and children's internalising and externalising problems and grief in parentally bereaved children and adolescents (Wolchik, Ma, Tein, Sandler, & Ayers, 2008; Wolchik, Tein, Sandler, & Ayers, 2006). However, mediation was not found within longitudinal analyses that controlled for prior levels of self-concept and mental health problems, which may suggest that children's later functioning was mediated through earlier coping. Without longitudinal support, however, there is no evidence to support the proposed direction of these cross-sectional results. Other cross-sectional evidence revealed perceived competence to mediate the associations between parental warmth and internalising and externalising problems in children of divorce (Sandler, Wolchik, Davis, Haine, & Ayers, 2003).

The mediational role of self-esteem in promoting mental health outcomes has been supported in other at-risk samples. In impoverished children and adolescents, many of whom belonged to an ethnic minority and had been maltreated, self-reported self-esteem was found to fully mediate the association between security in the mother-child relationship and the children's subsequent internalising and externalising problems (J. Kim

& Cicchetti, 2004). In impoverished African American teenage girls living in violent neighbourhoods, self-esteem partially mediated links between their perceived levels of family and peer support and their levels of anxiety and depression (Gaylord-Harden, Ragsdale, Mandara, Richards, & Petersen, 2007).

Connell and his colleagues (Connell et al., 1995; Connell et al., 1994) have shown self-concept variables to mediate links between parent support and engagement outcomes in at-risk youth. In samples of predominantly poor adolescents, most of whom were African American and living in high-risk urban areas, levels of self-esteem and self-efficacy partially mediated their perceived levels of parental warmth and involvement, and their classroom engagement. In turn, their classroom engagement was related to a lower number of subsequent risk behaviours, including being suspended, repeating a school grade, and dropping out of school.

Finally, two studies have tested similar mediating hypotheses in regards to the beneficial effects of teacher support. Both of these studies based their analyses on the Self-Systems Model. Connell and colleagues (1994) studied how supportive relationships helped African American adolescents living in high-violence urban areas to experience high classroom engagement and stay in school. Over and above the effects of socioeconomic and neighbourhood risk experienced by this disadvantaged sample, the adolescents' levels of perceived teacher support and involvement were related to their engagement directly, but also indirectly, through associations with the adolescents' self-esteem and self-efficacy. This classroom engagement was subsequently associated with the likelihood of staying in school 3 years later. Finally, Sharkey and colleagues (2008) used the Self-Systems Model to examine whether teacher support indirectly promoted adolescents' emotional engagement with school (akin to school belonging) through their self-concept, by analysing models for adolescents with high and low levels of family support separately. Self-concept was found to partially mediate students' teacher support and emotional engagement only for the 'family risk' (low family support) group. Whilst teacher support was directly associated with engagement for the 'family strength' group, there was no mediating effect, as self-concept was unrelated to engagement. Thus, while teacher

support was found to be promotive, self-concept emerged as protective for the students who were most at-risk.

Collectively, this small amount of evidence suggests that the process of resilience may stem from supportive relationships with adults. If relationships show such powerful and generative effects in the preschool and early school years, then they may be the best candidates for use in early intervention programs. Evidence for this effect would substantiate the intuitive notion that interventions may work better by focussing not on what children can do for themselves, but on how adults can support children's own efforts through guidance and encouragement (Luthar, 2006).

2.5 Conclusion

Classroom engagement represents a promising target for change in the quest to provide children with the best possible start to school. Not only does it shape the foundations of children's learning and achievement that underpin their schooling trajectories, but it appears to be the most effective mechanism by which positive change and long-term benefits might be achieved within interventions. Furthermore, as educators, policy makers, and researchers all agree with respect to its importance, interventions that target it may be readily funded by government and independent organisations, feasibly conducted within schools, and enthusiastically implemented by teachers. Given this, it is surprising that there is so little empirical evidence as to how best we can promote children's engagement during their first year of school. So much more remains to be discovered before interventions that target children's classroom engagement can be hoped to achieve maximum impact.

Simply knowing what factors promote engagement is not enough. A concerted focus is needed to identify just which of these factors should be prioritised within interventions. The most cost-efficient factors are those that galvanise other factors, providing children with 'cumulative protection' to achieve the greatest returns. The identification of such factors requires knowledge of the processes underlying early engagement, which is currently lacking within the literature.

Furthermore, information is needed as to whether all children may receive the same benefits from the one intervention program. This information will dictate whether one universal or several targeted interventions are developed. First, will boys and girls benefit equally from the promotion of the same mental health factors? Second, can the same factors help both relatively high-functioning community samples, and at-risk children? If the answer to both of these questions is yes, then the same universal intervention may be provided for all children to help give them a strong start to school.

Several converging models along with some empirical evidence suggest that children's relationships with significant adults are a key target for promoting positive change because they galvanise children's internal strengths, such as positive self-concepts. Both engagement and resilience models converge, suggesting we may help both advantaged and disadvantaged children using the same interventions. Thus, it is possible that relationships may have dual functions in achieving the same positive outcomes in different populations: they may not only promote engagement, but also buffer the negative effects of risk and lead to coping. Even if this is the case, the strength of these processes may differ between low- and high-risk circumstances. Despite some promising evidence that these processes may apply to engagement from both a competence and a resilience perspective, there is no evidence to suggest that these models may apply to children making the transition from preschool to school.

2.6 Purpose and Aims of this Thesis

The broad purpose of this thesis was to examine the predictors and processes of children's classroom engagement across the preschool-school transition. This thesis extends knowledge on early engagement by studying the effects of multiple preschool factors, at the level of the child (self-concept, mental health problems) and the environment (relationships with adults within family and preschool environments). To achieve this aim, a large community sample of young children was recruited in order to assess school adjustment in a normative school cohort that showed varied levels of functioning. Longitudinal data was used to examine predictors prior to the actual

transition, during preschool, and engagement following this transition, in the first year of school.

Key aims of the study were:

1. To develop a comprehensive and developmentally-appropriate teacher-reported measure of kindergarten children's classroom engagement, by modifying and testing the performance of the Rochester Assessment Package for Schools (RAPS) engagement scale with this age group.
2. To examine associations between children's preschool mental health problems and their subsequent classroom engagement in kindergarten, and to investigate possible gender differences in this association.
3. To examine the processes by which children's relationships with adults in preschool are associated with their kindergarten classroom engagement, using a modified version of the Self-Systems Model that included mental health problems.

The final two aims took a risk and resilience perspective, by examining children's engagement in relation to their levels of cumulative risk:

4. To examine the processes by which children's relationships with adults in preschool are associated with their kindergarten *resilience*, (i.e., engagement that is 'better than expected' in the context of cumulative risk). A more specific aim was to determine if these processes are protective - only applying in high-risk children - or promotive - applying to high- and low-risk children equally.
   To take a complementary 'person-centred' approach to resilience, by examining the preschool characteristics of resilient kindergarten children, identified from their high levels of engagement despite their high levels of risk.

Each of these aims forms the basis of its own subsequent chapter. Within the chapters, each aim is expanded into several testable hypotheses.

3

METHOD

3.1 Participants

Participants were 575 reception children (mean age = 5.55 years, *SD* = 0.31, 49% boys). This sample was drawn from a larger longitudinal study of child development spanning 3 years (see Appendix A for more information). Children were in preschool in Wave 1, reception in Wave 2, and year 1 in Wave 3. Wave 2 was the year that children started school, and is the focus of this thesis. In subsequent chapter sections, participation criteria, the proportion of participating children, and demographic details are described for each study wave. Detailed demographic information for this sample is provided in chapter 4.

3.1.1 Wave 1.

Families of children regularly attending 'sessional preschool'[6] at 1 of the 27 government-funded preschools in the Southern Sea and Vines government-funded schooling district of South Australia were invited to participate in the study (Appendix A provides detailed information about this schooling district). At the time of recruitment, Department of Education and Children's Services (DECS) district records indicated that 1076 children were enrolled in sessional preschool. Preschool children were considered ineligible if attendance records indicated that they attended preschool sporadically or not at all, or if they had left the preschool following enrolment. After excluding 109 non-attending children, 967 were considered eligible for the longitudinal project. The families of 666 of these eligible children consented to parent and teacher participation (families of an additional 30 children consented only to teachers completing surveys, reporting that

[6] The sessional preschool program is available to all children in the year immediately prior to beginning full-time schooling. From 4 years old, children are entitled to 4 sessions per week for 4 consecutive terms (i.e., 40 weeks) until they turn 5 and are eligible to start school. South Australian children start their reception year of school in the term following their fifth birthday; that is, intake occurs in all school terms.

they were too busy to complete a parent survey). However, only 601 of these children had both parent and teacher surveys returned.

Additionally, only children who had started school by the Wave 2 assessment (1 year after recruitment) were eligible for the current study. This criterion could only be imposed at Wave 2, but as most children are old enough to begin school after 1 year of preschool, most of the 601 children recruited were expected to make this transition. The main exception to this is some children of Aboriginal/Torres Strait Islander (ATSI) descent, as this population is entitled to start sessional preschool from 3 years of age. Any 3-year-old ATSI children among the sessional preschoolers would thus be too young to have started school 1 year later. DECS district records indicated there were 23 3-year-old ATSI sessional preschoolers during the school term prior to data collection. Consequently, approximately 23 sessional preschoolers may not have been eligible for inclusion in this thesis. The exact number of 3-year-old ATSI district preschoolers was not known, as demographic information was only collected for the 601 *participating* children. Of these, seven 3-year-old ATSI children were identified from information in parent surveys. These children were consequently removed from the number of eligible children (becoming 960) and participating children (becoming 594) (See Figure 3.1). Consequently, the 594 children who participated in Wave 1 constituted 62% of the 960 eligible sessional preschoolers. However, this percentage may be underestimated by at most 2%, given approximately 23 children may have been only 3 years old, and thus not eligible for inclusion. These amended responses are provided in Figure 3.1.

Additionally, participation figures for each preschool are provided in Figure 3.2. From visual inspection, variation in participation (17% to 93%) did not seem to be related to either preschool size (i.e., number of enrolled children) or socio-economic status.

Reasons for families' non-participation were not systematically recorded. However, when approached by researchers, some families stated they were too busy to participate. Other families stated they were not interested; preschool teachers thought many families' disinterest stemmed from either low literacy levels, or wariness of research. It is also unclear as to why parent surveys were not returned for 65 of the children with parent

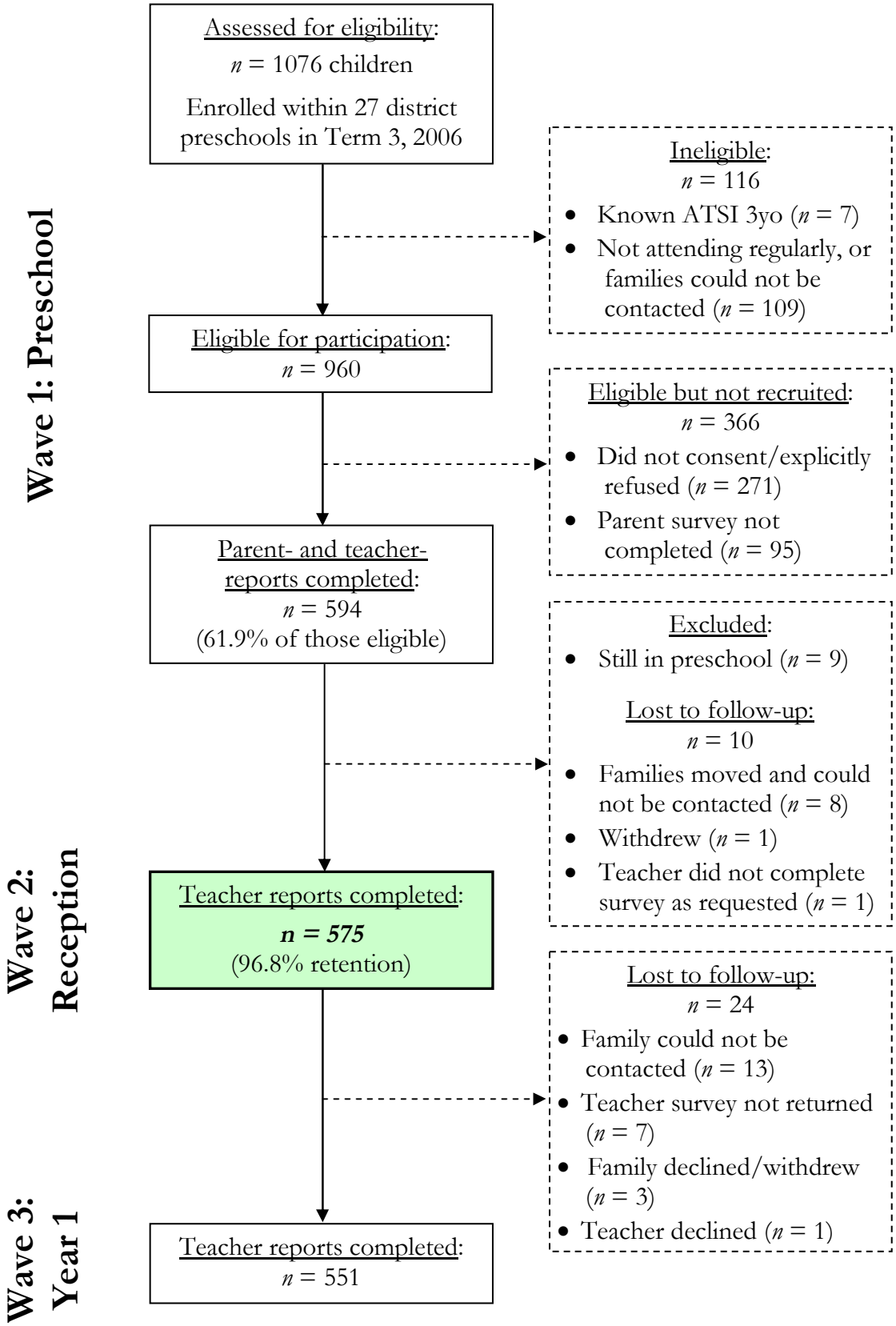


Figure 3.1. Participation and recruitment flow chart. The sample that is the focus of this thesis is shaded green. ATSI 3yo = 3-year-old child of Aboriginal/Torres Strait Islander descent.

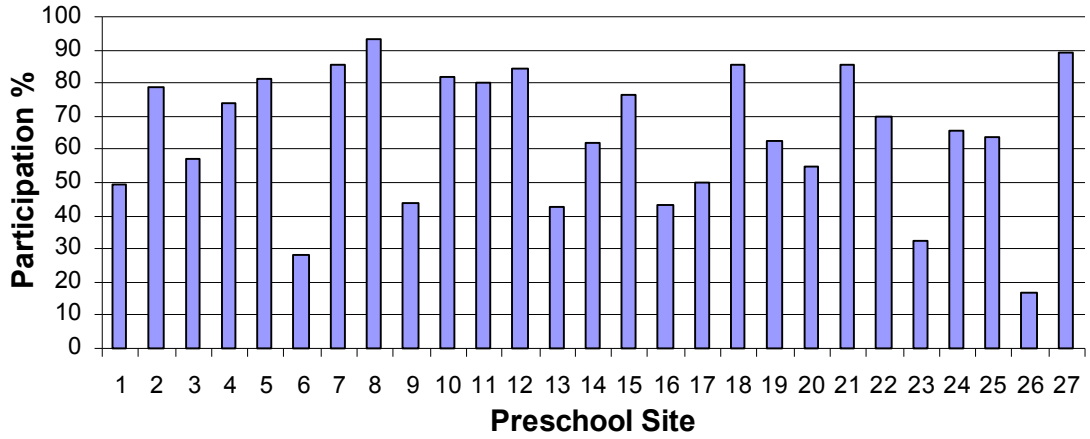


Figure 3.2. Wave 1 participation at each of the 27 preschool sites.

consent. Of these, 21 children (or 32%) subsequently had parent surveys completed in Wave 2, suggesting that these families were simply too busy in Wave 1, or forgot. In contrast, when contacted in Wave 2, a small number of these 68 families stated they chose not to complete their Wave 1 survey. Exact numbers and specific reasons for non-completion were not recorded. Demographic information for non-participating families was not available.

3.1.2 Wave 2.

Wave 1 participants were eligible to participate in Wave 2 if (1) their teacher completed and returned a questionnaire for them, and (2) they had started school.

Of the 594 children included in the Wave 1 assessment, 584 had teacher-completed surveys returned in Wave 2 (see Figure 3.1). Of the 10 children lost to follow-up, 1 child's mother withdrew from the study; 1 child did not have her teacher-reported questionnaire completed as requested, and her teacher could not be contacted further; and 8 children had moved since Wave 1, and their families could not be contacted. Children who were lost to attrition after Wave 1 (n = 10) differed from the thesis sample (n = 575) in three ways, which are detailed in Table 3.1.

Additionally, nine of the children with completed teacher-reported questionnaires were subsequently excluded from this thesis, as they had not started primary school - it was their preschool teachers who had completed surveys. Of these nine children, one child

Table 3.1
Demographic Differences between Wave 2 Participants and Those Lost to Follow-Up

	Wave 1 participants				
Wave 1 Variable	Retained in Wave 2 (n = 575)	Lost to follow-up in Wave 2 (n = 10)	χ^2 or t	df	d
ATSI (p) (%)	1.4%	30.0%	29.48***	1	-
Father unemployed (p) (%)	12.5%	50.0%	6.79**	1	-
Mother's age at child's birth (p) (*M* and *SD*)	29.02 (5.30)	25.04 (4.95)	-2.24*	576	0.78

Note. ATSI = Aboriginal/Torres Strait Islander; (p) = parent-reported variable; d = Cohen's measure of effect size.
* $p < .05$. ** $p < .01$. *** $p < .001$.

and his family had gone travelling, delaying him starting school. One child had turned five and was no longer eligible for preschool, but could not start at her chosen private school until the new school year - consequently, she was in 'limbo' in childcare. The remaining seven children were retained in preschool for developmental reasons. Thus, Wave 2 data were available for 575 children (97% retention). It is these 575 children who are the focus of this thesis. A detailed description of the demographic characteristics of this sample is provided in chapter 4.

Of the 575 participants, 87% (n = 498) also had a parent-reported questionnaire completed in Wave 2. Some of this information was used in this thesis (see chapter 5). However, these 498 children differed from the remaining 77 children without parent-reported data in several ways, as detailed in Table 3.2. However, these were generally only small-sized differences (Cohen, 1988).

3.1.3 Wave 2 sub-sample involved in direct testing.

From the 575 thesis participants, a stratified random sub-sample of children was selected to take part in interviews (assessing emotional engagement) and observations (assessing engagement) during a normal school day. Children who were in their first term of school were excluded, given they were still adjusting to school. There were two strata of interest; school SES (high/low), and school location (rural/urban). Thus, four groups were

Table 3.2
Wave 1 Demographic Differences between Participants With/Without Wave 2 Parent-Reported Surveys

	Thesis participants (n = 575)				
Variable	With parent-reported surveys (n = 498)	Without parent-reported surveys (n = 77)	χ^2 or t	df	d
	%				
ATSI (p)	0.6%	6.5%	12.85***	1	-
Single parent household (p)	13.5%	31.2%	14.34***	1	-
Receiving a pension or benefit (p)	40.4%	58.4%	8.05**	1	-
Mother has a university degree (p)	20.3%	5.3%	8.97**	1	-
	M (*SD*)				
Mother's age at child's birth (p)	29.27 (5.20)	27.43 (5.64)	2.84**	567	0.34
Father's age at child's birth (p)	32.37 (6.03)	29.94 (6.24)	3.22**	549	0.40
Mental health problems (t)	5.16 (5.00)	7.42 (5.94)	-3.59***	573	-0.41
Self-esteem (t)	57.39 (8.40)	54.09 (9.66)	3.14**	572	0.36
Self-efficacy (t)	30.13 (5.17)	27.96 (6.03)	3.34**	571	0.39
Teacher-child relationship quality (t)	68.35 (7.61)	65.59 (9.23)	2.87**	573	0.33

Note. ATSI = Aboriginal/Torres Strait Islander; (p) = parent-reported variable; (t) = teacher-reported variable; d = Cohen's measure of effect size.
** $p < .01$. *** $p < .001$.

created: (high SES-urban, high SES-rural, low SES-urban, and low SES-rural). Schools were randomly sampled from within each stratum until the quota of eligible participants had been met. For further information regarding stratification and sampling, see section 3.3.3.3.1 of Procedures.

A sub-sample of approximately 100 children was desired to provide reasonable power, while keeping time and resource expenditure to a minimum. Consequently, a pool of approximately 180 eligible participants from which to recruit (45 per stratum) was sampled, as response rates of 70% and 80% were predicted[7] for the two main recruitment stages (which are detailed further below). When schools were stratified and sampled,

[7] These response rates were predicted based on Dillman's (2000) mail survey research, and on our research unit's experience in this area.

approximately 179 children were expected to be eligible (see Table 3.3 for a breakdown by school site). However, this was subsequently reduced to 153 participants, as several of these children became ineligible. This was mostly due to attending a different school, or delaying starting school. Additionally, one child was withdrawn, one child became home schooled following trauma, and two children had developmental disabilities.

Participation is now detailed for the two recruitment stages. Firstly, parents were asked for their children's direct participation only after they had returned their Wave 2 questionnaires. Of the 153 potential participants, 128 (84%) had parent-completed questionnaires returned, and were asked to provide consent for their child's participation. Secondly, 104 of these children (82%) children received written parent consent to participate. However, this sub-sample was reduced to 98 (77%), as several children were absent on testing days, and one child changed schools shortly after receiving consent. Finally, two children did not complete interviews, as they were reluctant to participate (their teachers indicated this was probably due to language comprehension difficulties), resulting in an interview sample of 96. All recruitment and response rate information is separated into strata in Table 3.3.

Only one important difference was found between children whose families consented to direct measurement (n = 104), and the remaining children who were initially eligible (n = 49). Children in the testing sample (n = 104) had fewer stressful life events than all other initially eligible children (M = 0.83, SD = 0.98 vs. M = 1.38 SD = 1.70) (n = 49): t (149) = -2.09, $p < .05$. This was a medium effect size (d = -0.40).

Several differences were also noted between this sub-sample (n = 98), and the other children within the total thesis sample (n = 477). The sub-sample had been at school significantly longer (M = 3.10 terms, SD = 0.90 vs. M = 2.45 terms, SD = 1.03), and was older than the remainder of the total sample (M = 5.69 years, SD = 0.24 vs. M = 5.53 years, SD = 0.31). This was unsurprising, as children in their first school term were excluded. However, several other small-sized differences were noted, with the sub-sample showing slightly better functioning in all cases, as detailed in Table 3.4.

Table 3.3
Sub-Sample Recruitment and Participation Details by Strata

Stratum	Estimated potential sample size	Stratum selection odds	Final potential sample size	Parents sent letter	Parent consent returned	Tested	Participation %
1 (low SES-urban)	**48**		**36**	**32**	**24**	**22**	**68.8**
Site A	25	4/9	20	17	13	12	70.6
Site B	23	2/9	16	15	11	10	66.7
2 (high SES-urban)	**48**		**39**	**32**	**28**	**28**	**87.5**
Site C	21	1/1	17	15	13	13	86.7
Site D	27	1/1	22	17	15	15	88.2
3 (low SES-rural)	**38**		**35**	**26**	**24**	**21**	**80.8**
Site E	25	1/1	23	18	17	14	77.8
Site F	13	1/1	12	8	7	7	87.5
4 (high SES-rural)	**45**		**43**	**38**	**28**	**27**	**71.1**
Site G	32	3/4	33	28	19	19	67.9
Site H	13	2/4	10	10	9	8	80.0
Total:	**179**		**153**	**128**	**104**	**98**	**76.6**

Note. Participation % refers to the number of children tested per number of parents contacted by letter.

Table 3.4
Demographic Differences between Wave 2 Participants In and Not In the Sub-Sample

Variable	Wave 2 participants: Direct testing sub-sample (n = 98)	Wave 2 participants: Remainder of total sample (n = 477)	χ^2 or t	df	d
	Wave 1				
	%				
Family receives a pension/benefit (p)	33.3%	45.6%	4.41*	1	-
	M (*SD*)				
Stressful life events (p)	0.75 (0.83)	1.00 (1.33)	2.42*	571	-0.23
Number of adolescent parents at child's birth (p)	0.03 (0.18)	0.11 (0.38)	3.16**	552	-0.27
Self-efficacy (t)	30.78 (4.65)	29.64 (5.45)	-2.13*	571	0.23
	Wave 2				
School avoidance (t)	0.29 (0.75)	0.87 (1.55)	5.66***	571	-0.48

Note. (p) = parent-reported variable; (t) = teacher-reported variable; d = Cohen's measure of effect size.
* $p < .05$. ** $p < .01$. *** $p < .001$.

3.1.4 Wave 3.

Wave 2 participants were eligible to participate in Wave 3 if their teacher completed and returned a questionnaire for them. Of the 575 participants within this thesis, 551 (96%) had Wave 3 teacher questionnaires returned (see Figure 3.1). Of the 24 children who did not have teacher questionnaires returned, 13 children's families could not be contacted to determine who their teachers were; teachers failed to return questionnaires for a further 7 children; 1 child's teacher chose not to participate, due to past issues regarding confidentiality (unrelated to this project); 1 child had parental consent for teacher participation withdrawn due to parent-teacher disagreement regarding the child's illness; and 2 children's parents wished to discontinue with the study. There were no appreciable differences between children from the main thesis sample (n = 575), with (n = 551) and without (n = 24) Wave 3 teacher data.

The 551 children with Wave 3 data were now split across two school year levels.[8] Most children had moved into Year 1 (n = 416), but 25% (n = 135) were still in reception. Almost 1 in 5 children (n = 104) were still being taught by their Wave 2 teacher.

3.2 Design and Measures

All data were collected through prospective methods. Data were collected over three waves, at yearly intervals.

Predictor variables were assessed in Wave 1. Both parents and teachers completed questionnaires assessing demographic characteristics, parent-child and teacher-child relationship quality, and children's self-esteem, self-efficacy, and mental health problems. Parents also completed scales and questions that assessed levels of demographic, socioeconomic and psychological risk experienced within the child's immediate family.

The main outcome variable, classroom engagement, was assessed in Wave 2 using teacher-completed questionnaires. Several variables used for validity checks were also assessed in Wave 2. Both parents and teachers completed questionnaires assessing children's school avoidance behaviours witnessed at home and school, respectively. Additionally, a sub-sample of 98 children reported on their emotional engagement during interviews, and their classroom engagement was observed by researchers, during a normal school day.

Several variables used for validity checks were collected in Wave 3. Teachers completed questionnaires assessing children's school progress, the frequency of disciplinary action children received, and their school and class absences and lateness. Finally, demographic variables were assessed in all three study waves.

Table 3.5 details when and how measures were administered. All measures demonstrated good levels of internal consistency (see Table 3.5).

[8] In South Australia, children start reception in the term after their fifth birthday, but there is only single entry to year 1, at the start of the school year. Children must have completed a minimum of three terms of reception to begin year 1. Consequently, participants who had started school in Term 3 of Wave 2 remained in reception during Wave 3.

Table 3.5
Summary of Measures/Questions

Measures/questions	Internal consistency (α)
Wave 1 parent surveys	
Parent-child relationship (CPRS)	.79
Self-concept (BRF-R and SES-TV)	.87
Mental health problems (SDQ)	.78
Risk measures	
Wave 1 teacher surveys	
Teacher-child relationship (STRS)	.89
Self-concept (BRF-R and SES-TV)	.87
Mental health problems (SDQ)	.85
Wave 2 parent surveys	
School avoidance (SLSA)	.95
Wave 2 teacher surveys	
School avoidance (SLSA)	.71
Classroom engagement (RAPS-R)	-[a]
Wave 2 direct child testing	
Child-reported emotional engagement	.75
Observed engagement (LIS-YC)	-[b]
Wave 3 teacher surveys	
Disciplinary action	.83
Absence/lateness from school (unexplained)	.79
Absence from class	-[b]
School progress	.92

Note. Standard demographic information was also assessed in each parent and teacher survey. Where standard questionnaires are used, their names are given in parentheses. [a]Reliability and validity information for the final version of this scale is reported in chapter 5. [b]Internal consistency estimates could not be computed for single-item measures.

3.2.1 Wave 1 measures.

3.2.1.1 Relationships with children.

Parents and preschool teachers described the quality of their relationships with participating children using the short forms (NICHD, 2000) of the Child-Parent Relationship Scale (CPRS: Pianta, 1995) and Student-Teacher Relationship Scale (STRS: Pianta, 2001), respectively (Appendix B1). The two parallel versions of the scale contain 15 identical items based on behaviours relevant to attachment theory, detailing aspects of the respondent's relationship with the study child. Parents and teachers rated the degree to

which these items applied to their relationships, using a 1 (*definitely does not apply*) to 5 (*definitely applies*) scale. Items can be grouped within two subscales, labelled 'Closeness' (eight items) (e.g., "If upset, this child will seek comfort from me"), and 'Conflict' (seven items) (e.g., "This child and I always seem to be struggling with each other"). However, only the total score (where items are summed after reverse-scoring Conflict items) was used in this thesis. The parent and teacher scales have consistently shown good psychometric properties (NICHD, 2000, 2004a, 2004b; Pianta, 2001; Plake, Impara, & Spies, 2003). Additionally, the STRS has shown a strong positive association with engagement, as measured by the Teacher Rating Scale of School Adjustment (TRSSA: Birch & Ladd, 1997; Valiente et al., 2008).

3.2.1.2 Self-concept.

Parents and teachers completed two measures that, in combination, were used to measure *their perceptions of* children's self-concept. The Behavior Rating Form-Revised (BRF-R: H. M. Hughes & Pugh, 1984) assessed children's behavioural self-esteem, and the Self-Efficacy Scale - Teacher Version (SES-TV: Fall & McLeod, 2001) assessed children's self-efficacy. Both measures have shown good psychometric properties, including internal consistency, inter-rater and test-retest reliability, strong factor structure, and criterion validity (Fall, Balvanz, Johnson, & Nelson, 1999; Fall & McLeod, 2001; Fall, Navelski, & Welch, 2002; H. M. Hughes, 1984; H. M. Hughes & Pugh, 1984; Kemple, David, & Wang, 1996). Scores on both scales were standardised, and then summed to create a total self-concept score.

Proxy reports (i.e., from parents and teachers) of children's self-concept were used because of the measurement problems involved in obtaining reports from young children, including expressive language difficulties, a tendency to focus on ideal rather than actual self-concept, and difficulties understanding and correctly using rating scales. These problems are reflected in the lack of psychometrically rigorous self-reported self-concept measures for young children (see Davis-Kean & Sandler, 2001). As young children manifest self-concept in their behaviour, adults can rate their behavioural self-concept, and these ratings are significantly related to children's reports (Harter, 2006; Verschueren,

Marcoen & Buyck, 1998). Nonetheless, it is important to highlight that the self-concept measures used in this thesis had to be inferred through the children's behaviour, and thus could be termed more accurately as *behavioural* self-concept. However, the *behavioural* prefix will be not be used herein, for parsimony.

The level of children's general self-esteem was assessed by the Behavior Rating Form-Revised (BRF-R: H. M. Hughes & Pugh, 1984), adapted from the Behavior Rating Form (BRF: Coopersmith, 1967) (Appendix B2). The scale (identical for parent- and teacher-reports) contains 14 items describing behaviours that are reflective of high and low self-esteem levels, such as "this child refers to himself/herself in generally negative terms". Parents and preschool teachers were asked to rate how often each statement applied to the child over the last 6 months, or the whole preschool year, on a 1 (*never*) to 5 (*always*) scale. A total score is generated by summing all items, after reverse-scoring the negatively worded items. Possible scores range from 14 to 70, with higher scores indicating higher levels of inferred self-esteem.

Children's levels of self-efficacy were assessed using the Self-Efficacy Scale - Teacher Version (SES-TV: Fall & McLeod, 2001) (Appendix B2). The scale consists of 9 items that reflect self-efficacious behaviours (e.g., "when presented with a new task, the child believes he/she can do it") and the effects of self-efficacy (e.g., "the child makes choices easily"). Parents and preschool teachers indicated the degree to which each statement applied to the child on a 1 (*not at all like the child*) to 4 (*like the child*) scale. All items are summed to create a total score, after reverse-scoring some items. Possible scores range from 9 to 36, with higher scores indicating higher levels of perceived self-efficacy.

These two aspects of self-concept were combined due to the high theoretical and empirical similarity between self-esteem and self-efficacy (T. A. Judge, Erez, Bono, & Thoresen, 2002). Consistent with this, there was high item wording overlap between the two scales, and unsurprisingly, the data suggested that they appeared to be tapping the same construct, showing moderate to high intra-informant correlations (.62 for parent reports, and .85 for teacher reports), according to Cohen's (1988) guidelines. Internal

consistency for the created self-concept variables was high (see Table 3.5), providing further support for combining these scales.

3.2.1.3 Mental health problems.

The level of children's preschool mental health problems were assessed by the parent- and teacher-reported versions of the Strengths and Difficulties Questionnaire (SDQ: Goodman, 1994, 1997) (Appendix B3). The SDQ is a brief behavioural screening questionnaire that identifies emotional and behavioural problems of children aged 3-16. Parents and preschool teachers reported on children's emotional, behavioural, and social strengths and difficulties over the past 6 months, or the current preschool year, responding to 25 items on a 0 (*not true*) to 2 (*certainly true*) scale. These items can be divided into 5 subscales containing 5 items each; the conduct problems (e.g., "Often fights with other children or bullies them"), emotional symptoms (e.g., "Often unhappy, downhearted or tearful"), hyperactivity/inattention (e.g., "Thinks things out before acting"), and peer problems (e.g., "Has at least one good friend") subscales assess difficulties, with positively worded items being reverse scored. Conversely, the fifth subscale, prosocial behaviour (e.g., "Considerate of other people's feelings"), is considered separately as a strength. Subscale scores range from 0 to 10, and a 'total difficulties' score is obtained from summing scores on the 4 difficulties subscales, ranging from 0 to 40 (Goodman, 1997). Cut-off scores at clinical levels are also available; 'abnormal' levels correspond with the top 10% of scores from a British normative sample, and 'borderline' levels correspond with the next highest 10%. Scores falling below the top 20% are considered 'normal' (see Goodman, 2010, for the actual cut-point scores). These cut-points are used in the current study.[9] As the focus within this thesis is on mental health *problems*, only items from the 4 'difficulties' subscales were included in analyses, omitting all 'prosocial behaviour' subscale items.

Numerous studies have confirmed the good psychometric properties of the SDQ, showing moderate to high alpha and test-retest reliabilities, sound factor structure, and

[9] As studies among Australian children (Hawes & Dadds, 2004; Mellor, 2005) have suggested similar norms to those of the British normative sample, there is no apparent need to deviate from the well-established British cut-points.

strong associations with diagnostic interviews, treatment status, and other behavioural checklists (Goodman, 1994, 1997, 2001; Goodman & Scott, 1999; Hawes & Dadds, 2004; Hayes, 2007; Klasen et al., 2000; Koskelainen, Sourander, & Kaljonen, 2000; Mathai, Anderson, & Bourne, 2004; Muris, Meesters, & van den Berg, 2003; Woerner et al., 2004). Cross-informant (i.e., parent and teacher) agreement is comparable to if not better than other behavioural screening tools (Goodman, 2001).

3.2.1.4 Cumulative familial risk.

Parents reported on 10 variables that assessed psychological, socio-demographic and socioeconomic risk occurring within the child's immediate family. These 10 variables were used in combination to assess levels of *cumulative* familial risk. The 10 individual variables are described in the subsections below.

Two composite indices were created from these 10 individual variables, by adding individual risk scores together. For the first index, risk was considered 'present' (scored 1) or 'absent' (scored 0) for each variable, and these scores were then added to provide a simple count of the number of risks experienced (as also adopted by Belsky & Fearon, 2002; Calkins, Blandon, Williford, & Keane, 2007; Sameroff et al., 1987; Shaw, Winslow, Owens, & Hood, 1998). Thus, total scores could range from 0 to 10, with higher scores indicating a higher number of risks experienced. The individual risk variables that were not already dichotomous were dichotomised according to well-established cut-points used in other studies (as detailed for each variable below, also see Rutter, 1979; Sameroff et al., 1987). For the second index, the original full response range (as described in the subsections below) was retained for all variables, thus the summed total reflected the degree of risk experienced. As the 10 variables had dichotomous, ordinal, and quasi-interval scaling, scores on these variables were first standardised prior to being summed (as also adopted by Masten et al., 1990; Obradović et al., 2010; Vanderbilt-Adriance & Shaw, 2008).

3.2.1.4.1 Psychological risk.

Two variables assessed psychological risk. Stressful life events occurring within the child's family were assessed using a modified version of the List of Threatening Experiences Questionnaire (LTE-Q: Brugha & Conroy, 1985; Brugha & Cragg, 1990) (Appendix B4). The LTE-Q contains 12 categories of common negative life events involving moderate or marked long-term threat, such as the death of a family member, or a major financial crisis. Parents indicated whether each life event had occurred over the past 12 months. Events checked *yes* were scored as 1, whereas events checked *no* were scored as 0. All items are then summed, to create a total score ranging from 0 to 12. For the dichotomous risk count, a score of 1 was assigned if families had experienced two or more stressful life events in the past year (corresponding to the top 25th percentile, which was the first discrete cut-point above the median).

The LTE-Q shows excellent test-retest reliability over 6 months, high agreement with ratings from a close informant, and good concurrent validity with a semi-structured interview, demonstrating high sensitivity and specificity (Brugha & Cragg, 1990). Scores can also discriminate between depressed patients and matched controls (Brugha & Conroy, 1985).

The modified version of the LTE-Q used in the Longitudinal Study of Australian Children (LSAC: Sanson et al., 2002) was used. This version was then modified for the current study to reflect events occurring in a child's family unit rather than for individuals, based on wording within the Family Inventory of Life Events (FILE: Patterson & McCubbin, 1983). For example, one item was changed from "you had a major financial crisis" to "a family member had a major financial crisis".

Additionally, parents' current levels of psychological distress were assessed using the 12-item version of the General Health Questionnaire (GHQ-12: D. P. Goldberg, 1972, 1978; D. P. Goldberg & Williams, 1988) (Appendix B5). The GHQ-12 is arguably the most widely used self-rating screening tool for detecting current diagnosable psychiatric disorders and psychiatric morbidity in primary care settings and community populations. Parents indicated the degree to which they had experienced 12 symptoms (with half

positively worded) over the last 4 weeks (e.g., "Have you recently been able to enjoy your normal day-to-day activities?") on a 4-point response scale (e.g., *more so than usual* to *much less than usual*). This response wording reflects change in a person's normal state rather than an absolute level. Consequently, it is designed to detect acute rather than chronic illness, and may not identify long-standing disorders. There are several scoring systems available (see D. P. Goldberg et al., 1997; Goodchild & Duncan-Jones, 1985). The original binary scoring, where response options are scored 0-0-1-1 (and so identify the occurrence of symptoms over non-symptoms) is recommended (D. P. Goldberg, 1978; D. P. Goldberg et al., 1997; D. P. Goldberg & Hillier, 1979), and used in this thesis. Total scores range from 0-12, with higher scores indicating greater severity of psychological disturbance. A cut-off threshold of ≥ 0/1 has discriminated best between 'cases' and 'non-cases' in a large Australian national sample (Donath, 2001). Consequently, children whose primary caregivers scored above this cut-off received a score of 1 for the dichotomous risk count.

The GHQ-12 is the most-used version of the questionnaire due to its brevity and availability of norms, and because it functions as well as the 28-item version (D. P. Goldberg et al., 1997; McDowell, 2006). The GHQ-12 has consistently shown a high degree of validity and reliability, including good test-retest, split-half and internal consistency reliability, high sensitivity and specificity, and significant and sizeable correlations with other measures of wellbeing and distress (D. P. Goldberg, 1972, 1978; D. P. Goldberg et al., 1997; Hoeymans, Garssen, Westert, & Verhaak, 2004; McDowell, 2006; Navarro et al., 2007; Tennant, 1977; Vieweg & Hedlund, 1983).

3.2.1.4.2 Socio-demographic risk.

Three variables assessed socio-demographic risk (Appendix B6). Parents reported on their child's current living arrangements, with response options including *two natural parents*, *mother/father alone*, and *parent and stepparent*. These categories were then dichotomised to reflect whether children were living in single parent households (scored 1). Additionally, parents reported on the age of their child's mother and father. The child's current age was subtracted from each parent's age to calculate the mother's and father's age when their

child was born. This age was then used to determine if each parent was an adolescent (defined as ≤ 20 years at the time of the child's birth, consistent with Kim-Cohen et al., 2004; Moffitt & The E-Risk Study Team, 2002) at the time of their child's birth (scored 1).

3.2.1.4.3 Socio-economic risk.

Five variables assessed socio-economic risk (Appendix B6). The first two variables assessed maternal and paternal low educational qualifications (with ordinal response options ranging from *completed university qualifications* to *primary school*). In calculating the dichotomous risk count, a score of 1 was assigned to not having completed high school or higher qualifications. The next two variables were maternal and paternal employment status (ordinal response options ranged from *full-time employment* to *not in paid employment*). In computing the dichotomous risk count, a score of 1 was assigned to *not in paid employment*. The last variable was receipt of any means-tested government pensions or benefits for low-income families (with *yes* responses scored as 1).

3.2.2 Wave 2 measures.

3.2.2.1 School avoidance.

The level of children's school avoidance behaviour was assessed using the School Avoidance subscale of the School Liking and School Avoidance scale (SLSA: Birch & Ladd, 1997; Ladd, 1990; Ladd et al., 2000) (Appendix B7). This scale was developed to examine the school adjustment of 5-year-old children. Parent and teacher versions assess school avoidance behaviour seen at home and school, respectively. Parents responded to five items (e.g., "asks to stay home from school") on a 1 (*almost never*) to 5 (*almost always*) scale, and teachers responded to six items (e.g., "asks how long it is until it is time to go home") on a 1 (*doesn't apply*) to 3 (*certainly applies*) scale. Both parent and teacher scales have shown high internal consistency, and good divergent and convergent validity (Birch & Ladd, 1997; Ladd, 1990; Ladd et al., 2000). Additionally, school avoidance has shown a small positive correlation with the engagement subscale of the Teacher Rating Scale of School Adjustment (Buhs, Ladd, & Herald, 2006).

3.2.2.2 Classroom engagement.

Reception teachers rated children's levels of classroom engagement using a modified version of the Rochester Assessment Package for Schools engagement scale (RAPS: Wellborn, 1991; Wellborn & Connell, 1987). For clarity, the original scale will be referred to as the RAPS, whereas the *final* scale version that resulted from the modification and validation described in chapter 5 will be referred to as the RAPS-R, as it was *revised* to be suitable for teachers to rate the *reception* children in the current sample.

3.2.2.2.1 Rochester Assessment Package for Schools engagement scale.

The Rochester Assessment Package for Schools engagement scale (RAPS: Wellborn, 1991; Wellborn & Connell, 1987) was developed to measure the classroom engagement of children in third grade and above, based on Self-Systems Engagement theory (Connell, 1990; Connell & Wellborn, 1991). Items assess emotional (e.g., interest, happiness, anxiety), behavioural (e.g., effort, attention, participation, persistence), and cognitive (e.g., preference for challenge, flexible problem solving) engagement. Teachers rate items using the stem "In class…" (e.g., "In class, this student does more than required") on a 1 (*not at all true*) to 4 (*very true*) scale. Subscale scores (behavioural, cognitive and emotional engagement) are generated by summing relevant items, and all items are summed to produce a total engagement score, after reversing negatively-worded items.

The questionnaire was developed in consultation with teachers to ensure high face validity (Wellborn, 1991). Additionally, the RAPS has consistently demonstrated good psychometric properties in various studies among middle and lower class primary school students, and disadvantaged ethnic minority students. Specifically, the RAPS has sound factor structure (Furrer et al., 2006; Skinner et al., 2009; Wellborn, 1991), with good to excellent internal consistency for both subscale and total scores (Decker et al., 2007; Peet et al., 1997; Skinner & Belmont, 1993; Skinner et al., 1998; Tucker et al., 2002; Wellborn, 1991). Split-half reliability is also high (Skinner et al., 1990). Teacher reports show moderate to strong stability across the school year (Skinner et al., 2008; Skinner & Belmont, 1993), and modest significant correlations with child reports and observed engagement (Decker et al., 2007; Furrer & Skinner, 2003; Skinner et al., 2009). Expected

associations between engagement and (1) parent, teacher and peer relationships, (2) children's internal characteristics (e.g., competence, autonomy, relatedness), and (3) school outcomes (e.g., achievement, school absence, and dropout) corroborate Self-Systems Engagement theory (Connell et al., 1995; Connell et al., 1994; Decker et al., 2007; Furrer & Skinner, 2003; Kindermann, 1993; Schmitz & Skinner, 1993; Skinner et al., 2008; Skinner & Belmont, 1993; Skinner et al., 1990; Skinner et al., 1998; Tucker et al., 2002; Wellborn, 1991).

3.2.2.2.2 Scale modification.

Although the RAPS was considered the best available engagement questionnaire for reception children (see Introduction section 2.3.3 for a review of existing engagement scales), it had not been developed, nor validated for use with such young children. Consequently, as part of this thesis the scale was modified to be more developmentally appropriate, and then its psychometric properties were examined (in chapter 5). Scale development procedures (namely, devising and selecting items, and scaling responses) were conducted as recommended by Streiner and Norman (1995).

Two overlapping versions of the RAPS were consulted: the original version developed in Wellborn's (1991) dissertation, and the version used in current engagement research (see Skinner et al., 2009) (both shown in Appendix B8). Where items were similar, wording preference was generally given to the latter version, as (1) it was validated more extensively, so may have had better psychometric properties, and (2) wording was more direct and concise (as recommended by Streiner & Norman, 1995).

To ensure that the modified questionnaire showed sufficient content validity, a review of the classroom engagement literature was conducted, and questionnaires were identified that contained items relevant to 5-year-old children (summarised in Table 3.6). Following this review, the RAPS was seen to provide a comprehensive coverage of the engagement construct. However, two important concepts were not represented. Neither version of the RAPS included persistence or coping positively with failure (consistently identified in theory); however, related items were found within Skinner's optional 're-engagement' scale (Skinner et al., 2009), and in other questionnaires (Birch & Ladd, 1997;

Table 3.6
Summary of Questionnaires Identified through Literature Review as containing Engagement Items Relevant to Children in their First School Year

Reference	Measure	Construct/s	Development/ Testing sample	Example items
Birch & Ladd, 1997	Teacher Rating Scale of School Adjustment	Classroom participation: co-operative participation and self-directedness	US Kindergarten children	Listens carefully to teacher's instructions; seeks constant reassurance; easily makes transition from one activity to another
Fincham et al., 1989	Student Behavior Checklist	Learned helpless vs. mastery-oriented behaviour	US 3rd and 5th grade students	Tries to finish assignments, even when they are difficult*; when s/he fails one part of a task, s/he looks discouraged - says s/he is certain to fail at the entire task
Finn et al., 1991; Finn, et al., 1995	Student Participation Questionnaire	Participation: initiative, and disruptive and inattentive behaviour	US 4th grade students	Loses, forgets, or misplaces materials*; is persistent when confronted with difficult tasks*; attempts to do his/her work thoroughly and well, rather than just trying to get by; asks questions to get more information; completes assigned seat work
Fredricks et al., 2003	Engagement Scale	Behavioural, cognitive and emotional engagement	US 3rd-5th grade students	Teacher version: enthused about learning (does more than asked, volunteers); likes school Student version: I feel bored at school; I check my schoolwork for mistakes
Fullarton, 1998	Student Engagement Scale	Cognitive, behavioural and emotional engagement *in mathematics*	Australian 6th-7th grade students	Copes positively with failure (i.e., tries harder subsequently)*; perseveres in the face of difficult or challenging work*; is anxious

Table 3.6 cont.

Summary of Questionnaires Identified through Literature Review as containing Engagement Items Relevant to Children in their First School Year

Reference	Measure	Construct/s	Development/Testing sample	Example items
Harter, 1981	Intrinsic vs. Extrinsic Orientation Scale	Intrinsic motivation towards classroom learning: preference for challenge, curiosity/interest, independent mastery, and internal criteria for success/failure	US 3rd - 6th grade students	This pupil likes hard, challenging work; this pupil works to satisfy his/her own interest/curiosity; this pupil feels capable about making judgements about what to do
Hughes & Kwok, 2007	Teacher-Rated Effortful Engagement Scale	Academic (effortful) classroom engagement: effort, attention, persistence, and cooperative participation in learning	US 1st grade students	Perseveres until the task is finished*; does a thorough job; can be somewhat careless
McDermott et al., 1999	Learning Behaviors Scale	Learning behaviours: competence motivation, attitude toward learning, attention/persistence, and strategy/flexibility.	US 5-17 year olds	Shows a lively interest in learning activities; accepts new tasks without fear or resistance; cooperates in class activities sensibly; follows peculiar and inflexible procedures in tackling tasks
National Center for Education Statistics, 2002a, 2002b	'Approaches to Learning' scale	Attention-related classroom behaviours	US Kindergarten children	Keeps belongings organised*; persists in completing tasks*; easily adapts to changes in routine; works independently

Note. Asterisks indicate the items that were specifically referred to in modifying the RAPS scale for use in young children.

Fincham, Hokoda, & Sanders, 1989; Finn, Folger, & Cox, 1991; Finn, Pannozzo, & Voelkl, 1995; Fredricks et al., 2003; Fullarton, 1998; Harter, 1981; J. N. Hughes & Kwok, 2007; McDermott et al., 1999; National Center for Education Statistics, 2002a, 2002b). Two of these items were then added to the pool of RAPS items (see items in Table 3.6, see also items 17 and 24 in Appendix B9). Finally, a focus group of early childhood professionals (see Appendix A for more detail on this group) discussed their conceptions of engagement, and indicators of engaged children. This discussion did not identify any other construct facets. In contrast, the RAPS item referring to completing homework was specifically excluded from the item pool, as reception children in South Australia are not given homework. A pool of 32 items was developed from this review process, representing cognitive, behavioural, and emotional engagement. As discussed above, the vast majority of these items were taken directly from the two original RAPS versions.

Subsequently, one of the RAPS items in the item pool was considered to need re-wording, and for help with this modification, the engagement questionnaires in Table 3.6 were consulted. Specifically, the RAPS item pertaining to 'organisation' referred to 'home preparation' (e.g., arriving at school prepared), which the focus group considered less relevant for 5-year-old reception children in South Australia. Consequently, an item referring to organisation of personal classroom belongings, modified from two other engagement questionnaires (see Table 3.6, also Finn et al., 1991; National Center for Education Statistics, 2002a, 2002b), was used instead (Item 7 of Appendix B9). Additionally, response scale options were extended from four to five, to improve the questionnaire's distributional properties. Response wording was also changed to reflect frequency, which was easier for the teachers in the focus group to understand and respond to. Response options now ranged from *never* to *always*.

The 32 items were then reviewed by the focus group to identify problematic questions, such as those that were vague, double-barrelled, or included jargon. Several items were subsequently re-worded, for two main reasons. First, wording was changed on two items to remove the double-negatives that resulted from the changed response scale (e.g., 'doesn't pay attention' was changed to 'pays attention'). Second, three items that

referred to problems and assignments were changed to refer instead to tasks and activities, to be more applicable to 5-year-old children (e.g., 'prefers assignments which he/she already knows how to do' became 'prefers activities'). The focus group agreed that all items were relevant, and that no aspects were missing. Group members then completed the amended questionnaire by rating a randomly-selected student. These respondents used the full range of response options, supporting the selection of the more extreme *never* to *always* wording. Items that were conceptually similar to other items, and showed similar response patterns, were considered redundant and removed. Finally, a balance between behavioural, emotional, and cognitive subcomponents, and positive and negative wording was attempted.

Once this process was complete, the modified engagement questionnaire consisted of 24 items, representing behavioural (10 items), emotional (8 items), and cognitive (6 items) engagement. Approximately half (i.e., 13) of these items were positively worded (Appendix B9). This scale was validated and refined further in chapter 5. See chapter 5 for details on the descriptive and psychometric properties of the final scale – the RAPS-R.

3.2.2.3 Self-reported emotional engagement.

During one-on-one interviews, children reported their level of emotional engagement with classroom learning using seven items from the emotional engagement subscale of the Rochester Assessment Package for Schools self-report (Wellborn, 1991; Wellborn & Connell, 1987). This scale closely parallels the emotional items within the previously mentioned teacher-reported engagement scale. Items assess children's emotions (e.g., interest, happiness, anxiety and anger) during class activities (e.g., "In class, I feel angry"). Internal consistency and construct validity is good, with similar levels to those for the teacher reported scale (Furrer & Skinner, 2003; Miserandino, 1996; B. C. Patrick, Skinner, & Connell, 1993; Skinner & Belmont, 1993). Child reports show small positive correlations with teacher-reported emotional engagement (Furrer & Skinner, 2003; Skinner & Belmont, 1993).

As this scale has mostly been used in children from third grade upwards, only items that the focus group agreed were understandable to 5-year-olds were used here (e.g.,

'frustrated' and 'anxious' were considered beyond the full comprehension of most reception children). Also, as the current sample was too young to either read or write their responses, items were read to children during interviews, and children responded verbally using a pictorial aid (four circles of increasing size) (Appendix B10). Responses ranged from 1 (*never*) to 4 (*all of the time*). This interview format was adapted from interviews developed and validated for children who have just started school, which demonstrate adequate psychometrics (Harter & Pike, 1984; Stipek et al., 1995; Stipek & Ryan, 1997; Valeski & Stipek, 2001). A standardised interview script was used, and included instructions, practice questions, prompts and examples (Appendix B11). Play materials including bubble-blowing materials were used if children needed a break during the interview.

Prior to use in this thesis, the interview was piloted in two schools that were not participating in the broader project. The children involved in piloting understood the interview items (and provided valid examples of when they felt each emotion, such as feeling excited when going on a trip away), and understood and used the full range of the response scale.

3.2.2.4 Observed classroom engagement.

Children's classroom engagement was observed by two independent raters using the Leuven Involvement Scale for Young Children (LIS-YC: Laevers, 1994). This tool was developed for children aged 3-6 years. Children were observed in their normal classroom setting for a series of eight 2-minute intervals over the school day. Observers looked for 9 possible indicators of engagement: concentration, energy, complexity/creativity, facial expression/posture, persistence, precision, reaction time, verbal utterances, and satisfaction. Observers rated children's behaviour on each indicator as low, medium or high. Based on these indicators, observers then made an overall rating of the child's engagement on a 1 (*no form of participatory activity*), to 5 (*intense and maintained levels of engagement*) scale (see Appendix B12 for rating sheet). Consistent with the other engagement measures used in this thesis, observations focussed on *classroom* learning

activities such as mat, desk or group work, comprising literacy, maths and science. Thus, out-of-class activities (e.g., music, art, fitness, foreign language) were not observed.

Prior to conducting these observations, the two observers underwent detailed training. During training, the observers read manuals (see material within Appendix B12), and rated videotaped classroom scenarios. As a test, observers then rated (1) 10 videotaped scenarios, and (2) 10 *in vivo* scenarios. For both scenarios, inter-rater reliability was above $r = .80$, and 100% of ratings were within one scale point.

The LIS-YC has been used extensively by the developers and other European researchers (Pascal et al., 1998). This tool is also widely used among South Australian Department of Education and Children's Services (DECS) staff as an indicator of teaching quality, and as a basis for child-centred intervention (Department of Education and Children's Services, 2008a). The LIS-YC demonstrates sound factor structure, high inter-rater reliability, and is significantly related to theoretically relevant constructs, such as wellbeing, mental development, relationships with childcare providers, elaborate play, and social and academic competence (Laevers, 1994; Pascal et al., 1998; Ure, 2004; Uren & Stagnitti, 2008; Winter, 2003). In the present study, 30% of all observations were scored by both observers. Inter-rater reliability was above adequate, $r(116) = .78$, $p < .001$, 63% of observations were in exact agreement, and 99% agreed within one scale point. These figures met or surpassed the standards and final scores seen in other early classroom engagement observational studies conducted by NICHD (La Paro, Rimm-Kaufman, & Pianta, 2006; NICHD, 2002, 2005b; Pianta et al., 2005; Pianta, La Paro, Payne, Cox, & Bradley, 2002).

3.2.3 Wave 3 measures.

3.2.3.1 School progress.

Teachers rated children's school progress in reading, writing and maths using a modified version of the 'current school performance' subscale of the Mock Report Card (NICHD, 2000) (Appendix B13). For each subject area, teachers responded on a 1 (*poor/ below year level*) to 5 (*excellent/ beyond year level*) Likert-type scale. Scores were then summed to create a 'total progress' score ranging from 3 to 15, with higher scores

indicating higher progress. This measure has shown high levels of internal consistency among six listed subject areas, and was found longitudinally predictive of third grade achievement test scores (NICHD, 2000). This measure is also very similar (in terms of both content area, and response wording and scaling) to the 'current academic performance' measure from the well-validated Teacher Report Form (Achenbach & Rescorla, 2001), which is normed for 6 year old children.

The response wording was slightly changed to 'Year Level' from the more American 'Grade level'. Only three of the six academic areas listed in the NICHD scale were retained, chosen by the focus group as representing the key areas of academic curriculum (and so competence) for Australian reception/year 1 children.

3.2.3.2 Frequency of disciplinary action in school.

Teachers rated how often children received disciplinary action at three levels of severity/seriousness, by responding to three questions on a 1 (*never*) to 5 (*always*) scale (Appendix B14). The frequency of detention/suspension is assessed by many researchers (e.g., Connell et al., 1995; Connell et al., 1994; Finn & Rock, 1997; Lee & Smith, 1993; NICHD, 2000), but these disciplinary actions are rarely used with young children. Consequently, several disciplinary actions used with junior primary children were identified in consultation with the focus group. Specific actions were then combined to assess three broad but reasonably distinct levels of discipline: in-class action for low-level behaviour problems (e.g., reminders/warnings), out-of-class action for somewhat higher level behaviour problems (e.g., removal to 'buddy' classroom), and out-of-school action for extreme behaviour problems (e.g., modified attendance). However, the 'out-of-school' item was subsequently dropped from this scale, as scores showed very little variance, with most children receiving a rating of 1 (*never*). Thus, scores from the first two questions were summed to create a total score that ranged from 2 to 10.

3.2.3.3 School absence/lateness.

Teachers rated two items assessing how often children were absent from and late to school (unexplained) on a 1 (*never*) to 5 (*always*) scale (Appendix B14). Scores from these

two items were summed to create a total score that ranged from 2 to 10. Although other studies generally examine absences as a proportion - of number of days absent per school term, semester or year (National Center for Education Statistics, 1999, 2004; NICHD, 2000), this level of detail was unnecessary here. Using a broader overall frequency rating allowed variability in the data, and may have generated somewhat less skewed data, being on a 5-point rather than a continuous scale. Similar measures have demonstrated construct validity by showing negative correlations with engagement (Connell et al., 1995; Connell et al., 1994).

3.2.3.4 Classroom absence.

Teachers rated how frequently children were absent from class during lesson times, through the use of a single question: "How often has this child been absent from *class* (e.g., returned late from recess/lunch, left class with little/no reason, took toilet breaks that were excessive in number/duration)" (Appendix B14). Teachers responded on a 1 (*never*) to 5 (*always*) scale. Frequency of classroom absences was assessed as actual school absences and truancy are less relevant among young children. Whilst school absences may be due, in part, to young children's desire to avoid school, ultimately they reflect the decision of parents to allow children to stay home. Absence from class may reflect more of a desire to avoid the classroom learning environment than would school absences, as it is within the child's control. Examples of being absent from class were included in the question to orient teachers, and were developed in consultation with the focus group. Similar questions in other studies have shown construct validity by showing negative correlations with both engagement and achievement among middle-school students (Finn & Rock, 1997; Lee & Smith, 1993).

3.2.4 Demographic characteristics.

Children's demographic characteristics were reported by parents and teachers during all three study Waves using standard questions (see Appendix B15). Both parents and teachers reported the children's age, gender, and school year level, and the length of time children had attended preschool/school. Additionally, both parents and teachers also

reported the name of the school children were attending, which was used to determine public/private school status. Finally, parents reported whether the child was of Aboriginal or Torres Strait Islander descent, and whether the child had a 'school card' in reception, which entitles children from low-income families to financial assistance towards their educational expenses (Department of Education and Children's Services, 2008b).

3.3 Procedures

All data collection procedures took place during the third term of each four-term school year. Terms 1 and 2 of each year involved liaising with teachers and principals to ensure school sites were prepared for data collection. In this way, the data collection during Term 3 could run smoothly, and provide the maximum possible time for actual survey completion.

At each wave, parents were informed that participation was voluntary, and that all information would be kept confidential. Ethics approval was obtained from the Human Research Ethics Committee of the Women's and Children's Hospital, Children, Youth and Women's Health Service, the University of Adelaide, South Australia, and the Department of Education and Children's Services (DECS) ethics committee.

3.3.1 Wave 1 data collection.

All 27 preschools in the Southern District of DECS had agreed to take part in this study prior to its launch. Most preschools had participated in a similar pilot study the year before, so they were familiar with the project. Preschools were given project materials in Term 2, including an information sheet detailing their role in issuing correspondence material to parents, distributing and collecting parent surveys, and completing teacher surveys (Appendix C1). To ensure sites received and understood these, they were followed up by telephone.

In the last week of Term 2, families received a notice regarding the study in the preschool newsletter (Appendix C2). Then in Week 1 of Term 3, families received a study pack through preschools, containing a letter of introduction (Appendix C3) and an information sheet (Appendix C4). Parents could then complete an accompanying consent

form (Appendix C5) which they returned to preschool staff. Parents were informed that consent also included consent for their children's teachers to complete a questionnaire, but that they could indicate if they wanted to consent to their own participation only. Parents were also informed that consent was for the entire 3-year study, but that they could withdraw their own participation and/or the teacher's participation at any stage. This form asked for detailed contact information, including that for next of kin, so that families could be contacted in subsequent years if they had moved. If parents chose not to participate, they were encouraged to indicate this on the consent form and return it. In this way, it was possible to distinguish between families who did not want to participate, and those that may have forgotten. A list of helpful child health/parenting organisations (Appendix C6) accompanied consent forms.

Once consent forms were returned, preschool teachers gave parents their surveys (the instructions within survey booklets are displayed in Appendix C7). Parents returned completed surveys to preschools in sealed unmarked envelopes to protect confidentiality. Additionally, the preschool teacher who best knew each participating child completed a survey (the instructions within survey booklets are displayed in Appendix C8). Teachers were asked to wait at least 5 weeks before completing surveys for children who started preschool that term, to ensure they knew these children well enough to rate their behaviour. Parent and teacher surveys took approximately 20 and 10 minutes to complete, respectively.

Several recruitment measures were established to maximise participation. Researchers visited each preschool site at least once during child drop-off and pickup times to have face-to-face contact with parents. Sites that received more than one visit were those that had large numbers of parents, or where not all preschool children attended on the same day, and also sites with slow recruitment. In Week 3, families received a notice (Appendix C9) through preschools to remind them to return a consent form (unless they had previously indicated they did not want to participate). This allowed enough time for parents to respond to the first notice, and so remind those who had forgotten. As preschool staff recorded which families had returned consent forms and surveys, they

were able to follow up families individually. The project endorsement by preschools may have encouraged some otherwise reticent or wary families to participate.

Preschool teachers returned completed parent and teacher surveys in the last week (Week 10) of Term 3. Each preschool received a confidential site 'profile report' and a cheque which reimbursed for the time taken for teachers to complete surveys (AUD$6 per survey). Four participating families were randomly chosen as winners of AUD$50 Toys 'R' Us vouchers.

3.3.2 Administration/preparation between Waves 1 and 2.

Several procedures involving families and teachers were enacted prior to Wave 2 data collection. This was to ensure the data collection period proceeded smoothly, and to promote a high retention rate.

3.3.2.1 Family procedures.

All participating families were sent a project newsletter at the beginning of Term 1 (Appendix C10). This provided some basic descriptive participant information, and helpful parenting advice. The purpose of the newsletter was to: (1) keep families engaged with the project, and (2) determine if any families had changed address since recruitment.

Changes of address were monitored in two ways. First, families who still received the newsletter could provide their new contact details using the 'change of address' slip (Appendix C11) and reply-paid envelope that accompanied the newsletter. Second, families whose newsletters were 'returned to sender' were followed up through their other contact details, or the White Pages telephone directory. If these families could not be contacted in this way, they were forwarded the newsletter (and 'change of address' slips and envelopes) through their preschool. Using these measures meant that most families received Wave 2 surveys at their current addresses in Week 1 of Term 3, giving them the maximum time possible to complete the survey. This also meant that scheduled survey follow-ups and reminders (discussed in detail later) could occur at the same time for most families.

3.3.2.2 Preschool/school procedures.

Wave 2 marked the transition from preschool to school. Consequently, several procedures were established to ensure that children could be tracked to their new school (enabling easier teacher survey administration) and that all school sites with large participant numbers were prepared for data collection.

Principals of the 33 district primary schools were first contacted regarding the project in Term 4 of 2006. Principals were mailed project information, and their schools were invited to take part in Term 3, 2007 (Appendix C12). If new principals were introduced for the 2007 school year, information was re-sent to those schools in Week 1 of Term 1, 2007. All principals were again contacted by email in Week 2 of Term 1 to obtain details of all reception teachers. Principals were also asked to nominate a project liaison person to handle all project correspondence and coordinate survey completion.

Preschool staff provided details regarding children's school transitions (i.e., school destinations and starting dates) in Term 4 of 2006. This information was updated in Week 2 of Term 2 2007.

The 2006 preschool transition information lists indicated that 9 local private schools were expecting ≥ 6 participants to attend by Wave 2 data collection. Numbers at private schools were expected to range from 6 to 25. These schools were subsequently offered the same level of support as the district schools, given the project would entail a reasonable amount of involvement for them. The principals of these schools were contacted regarding the project in Week 1 of Term 2. Principals were sent a letter (Appendix C13) and the same project information as district school principals received (as in Appendix C12), which was then followed up by telephone to discuss the project and elicit participation. All Principals at these sites agreed to participate. Reception teacher and liaison person information was obtained over the telephone. From then on, these sites were treated as the district schools were, and given the same level of contact, information, and support.

Finally, a project launch was conducted in Week 9 of Term 2. All principals, teachers, and liaison people from the 33 district schools and 9 private schools were invited

to attend. School staff received project information and materials, and project staff discussed the importance of the project, and the survey completion procedures. All sites received packages with a letter of explanation (Appendix C14), a list of participants expected to be attending their school, a set of instructions (Appendix C15), and ample surveys, and notices to be distributed to families (Appendix C16). Schools were also provided with the name and contact details of a 'research support person', who was available to answer any questions, and who would call regularly during the data collection process to ensure it was on track. Staff from 12 of the 42 sites could not attend; these sites were sent their packages and followed up by telephone, to ensure project information was received and understood.

3.3.3 Wave 2 data collection.

3.3.3.1 Parent survey procedures.

Parents participated in Wave 2 through a mail survey. This was considered the most viable method (logistically and financially), as children were expected to attend numerous schools, many outside of the partnership district within South Australia and interstate. The parent mail survey was conducted with the widely-used Tailored Design Method (Dillman, 2000), designed to maximise response rates through five personalised and varied contacts, with requests intensifying at each contact. This method has documented research and practical experience success (see Dillman, 2000).

The five stages involved in recruitment are now detailed. First, families were contacted through two brief forewarning notices. As with Wave 1, families received a reminder notice within the final Term 2 newsletters of district schools (Appendix C17). Then in Week 1 of Term 3, families of all reception children attending one of the 42 participating school sites received a similarly-styled handout (Appendix C16) through the classroom teacher. In both of these notices, families were encouraged to update their contact details if they had moved. Both notices were received by all families with reception children in these 42 schools, not just the participants who were expected to attend. This had the benefit of reaching families whose children were attending a different district

school from the one project staff expected. Unfortunately, not all participating families received this first contact, as not all children were attending these school sites.

Second, participating families were posted their survey in Week 1 of Term 3. A one-page letter (Appendix C18) reminded families of the study and of their past participation, and invited them to participate again. Families were reminded that they had consented to teacher participation, and that their child's teacher would be contacted on their behalf, but they were able to retract this consent. A reply-paid envelope for the survey and a change of address slip were included. Families were asked to return blank surveys if they no longer wished to participate, so they would not be followed up.

Many of these surveys came back as 'returned to sender'. Returned mail was followed up by attempting to reach families using their previously provided contact details. Where this failed, the White Pages directory was consulted. Families contacted in this manner provided their new addresses over the phone, and their surveys were re-sent. If families could still not be contacted and their children were known to be attending a district school, their surveys were forwarded to the school. The timing of subsequent contacts was staggered according to the date that these families' surveys were re-sent.

Third, families were mailed a postcard (Appendix C19) acting as either a 'thank you' for those that had retuned surveys, and a reminder for those that hadn't. This was sent 1 week after the survey, in Week 2 of Term 3, after most people were likely to have responded, but before the survey was thrown out or lost by the non-completing families. This was the last time that all Wave 1 participants were contacted; subsequent contacts were only made to families whose surveys (completed or blank) had not been received.

Fourth, non-responding families were sent a replacement survey and an accompanying letter (Appendix C20) 4 weeks after their first survey was sent, in Week 5 of Term 3.

Lastly, families received a telephone call as their fifth contact by researchers, at least 1½ weeks after the replacement survey was sent. Parents were asked if they had received the previous correspondence, if they had any questions about the study, and if they were willing to complete the survey. Some families had not received any mail

correspondence (although their mail had not been returned to researchers), so they were sent a survey after obtaining their addresses. Others stated they had lost or misplaced previous surveys, and so were sent another. Generally, parents said they were still planning on completing the survey, but had not yet done so due to busyness.

3.3.3.2 Teacher survey procedures.

3.3.3.2.1 Large participating schools.

Liaison people informed researchers of any children on their 'participant list' who were not attending their school, in Weeks 1-2 of Term 3. Likewise, researchers informed liaison people of other participants who were attending their school but were not on their 'participant list', as they were initially expected to attend school elsewhere. This information was passed on as soon as researchers were made aware of any school changes (through parent surveys or telephone correspondence).

Teachers were asked to begin completing surveys from Week 1 of Term 3. However, to ensure teachers had adequate knowledge of children, they were asked to wait until Week 5 for any children new to their class that term. Where two part-time teachers were 'co-teaching' within one classroom, either teacher could complete surveys, provided he/she knew children well enough. Liaison people returned the completed surveys at the end of Term 3. Each site was then reimbursed for the time taken to complete surveys.

3.3.3.2.2 Schools with fewer than 6 participants.

Teachers at school sites with fewer than 6 participants were mailed their surveys beginning Week 1 of Term 3. Teachers were sent a letter explaining the project, and the participation of the child in question (Appendix C21). A copy of the child's consent form was included, with all contact information erased for privacy reasons. Teachers were asked to return completed surveys in the reply-paid envelopes included.

Both teacher and parent survey booklets were of a similar format to those of the previous year, and took a similar amount of time to complete.

3.3.3.3 Sub-sample involved in direct testing.

3.3.3.3.1 Stratified random sampling.

Stratified random sampling was used to select potential participants for the sub-sample. This method was used to ensure that key demographic groups would be represented, and that the sample contained variation in its data.

Several stratification and selection criteria were imposed due to logistical (i.e., time and resource) constraints. First, the school was chosen as the unit of stratification. This was because sampling at the participant level was deemed impractical, given that district schools were up to 180km apart. Second, only schools with 10 or more potential sub-sample participants were included in sampling. This was to ensure maximum efficiency in data collection, given the distance between schools. Third, only district public schools (who were already collaboratively engaged in the project at a district level) were stratified. As private schools were not originally part of the project, involving them in direct testing may have placed an unnecessary burden on their already accommodating staff. At the participant level, children needed to have been at school for at least 1 term at the start of the testing period, to allow their behaviour and feelings towards school to stabilise somewhat after the initial transition period, and also so that students felt relatively at-ease during the interview process. After applying these criteria, 15 public schools[10] were included in stratification and random selection.

Two strata were considered relevant to this study. Firstly, socio-economic status was considered important, given the documented association between SES and school engagement (e.g., Berthelsen & Walker, 2009; Childs & McKay, 2001; Ladd et al., 1999). Secondly, given the district's geographical diversity, it was considered important to represent both metropolitan and rural areas. For the first stratum, the percentage of students at each school who held a school card (which entitles students from low-income families to reduced fees and associated costs) was considered to be the best approximation to each school's socio-economic status. This information was obtained from the Department of Education and Children's Services (DECS). At the time of stratification

[10] The three Kangaroo Island campuses were counted as one school, due to their remote location.

(2007), the most recent school card data was from 2006. A median split on the school card data was subsequently used to create high- and low-SES categories. For the second stratum, schools were classified as either metropolitan or rural using the Australian Standard Geographical Classification (Australian Bureau of Statistics, 2008b). Therefore, the combination of the two strata created four strata categories (low SES/urban, high SES/urban, low SES/rural, high SES/rural).

Schools were randomly sampled within each stratum, until the quota of eligible participants (approximately 180 in total, so approximately 45 per stratum category) had been met. Using this approach meant that there would be approximately equal participant numbers between strata, but not necessarily equal school numbers. The exact sampling method was as follows. Firstly, for each stratum, all possible combinations of schools that would produce approximately 45 participants (plus/minus 10) were generated. Then, one of these combinations was randomly sampled. The number of combinations a school appeared in varied, as did their probabilities of selection (as seen in Table 3.3). Once enough sites had been sampled to fulfil the participant quota, principals at these sites were contacted by mail in Week 6 of Term 2, and followed up in Week 7 by telephone. All principals agreed for their sites to be involved in direct testing.

3.3.3.3.2 Testing.

Researchers arrived at least 15 minutes prior to school starting, to liaise with the classroom teacher, obtain brief physical descriptions of each participating child (for identification purposes), and set up interview materials in a quiet place. Teachers were reminded to act as they normally would do, and pay researchers little attention. Researchers were briefly introduced to children prior to the morning roll call; this allowed children to familiarise themselves with researchers, and researchers to identify the target children.

Testing schedules for the day varied depending on each classroom's activities. However, an observation block (where all children were observed once) was generally conducted at the start of each of the three classroom periods (i.e., morning - recess time, after recess - lunchtime, and after lunch - home time). A fourth observation block

Table 3.7
An Approximate Interview/Observation Schedule for a Classroom with 7 Participants

Time	Activity
8.45	*Start of school day*
8.45-8.55	Roll call/Settling in time
9.00-9.20	**Observation #1 (all children)**
9.25-11.00	**Interview block # 1 (3/4 children)**
11.00-11.30	*Recess*
11.30-11.35	Settling in time
11.35-11.55	**Observation #2 (all children)**
11.55-12.40	**Interview block #2 (2 children)**
12.40-1.00	**Observation #3**
1.00-1.40	*Lunch*
1.40-1.45	Settling in time
1.45-2.05	**Observation #4 (all children)**
2.05-3.10	**Interview block #4 (remainder: 1/2 children)**
3.10-3.15	Pack up time
3.15	*Home time*

occurred in whichever classroom period it fit best. Individual interviews followed observation blocks, and carried through until break times. In this way, each observation block was completed for all participants during the same classroom activity, and interviews could be fit around them, across the day. An example testing schedule is provided in Table 3.7.

During observations, researchers sat to the side of where children were working. Following observation of each child, researchers wrote notes, rated the involvement signals, and made a final global engagement rating. Observations were done independently when two researchers were present. Researchers waited at least 5 minutes following return from recess and lunch breaks to ensure all children had arrived and were re-oriented to the classroom activities before undertaking observations. Any children who tried to engage with researchers were responded to in a friendly manner, but further interaction was discouraged.

For interviews, a standardised script was followed (Appendix B11). At the beginning of the interview, researchers oriented each child to the pictorial response scale,

and gave three practice questions to ensure children understood the scale and were responding appropriately. Then researchers chatted briefly about classroom activities, and "feelings that kids have" to orient them appropriately and ensure they understood the more complex emotions (i.e., bored, worried and excited). The engagement questions were asked, with clarification and probing questions to check children's responses were consistent with each emotion, and referred to the classroom setting. At the end of the interview, children were praised, given a scented pencil and a sticker, thanked for their participation, and dismissed. Researchers then made notes, and rated each child's attention, understanding, and engagement on a 5-point scale.

At the end of the day, researchers discussed the children's behaviour with teachers, and wrote brief reports.

3.3.4 Administration/preparation between Waves 2 and 3.

Very little preparation was needed prior to Wave 3 data collection, given all children had already started school, and school sites were familiar with the project. Correspondence materials were similar if not identical to those from the previous year. As with the previous year, families received a project newsletter (Appendix C22) with an accompanying 'change of address' slip at the beginning of Term 1. All principals at participating school sites were sent a letter and the project newsletter in Week 10 of Term 1 to remind them of the study and the impending data collection, and to ensure they were still willing for their site to be involved. Principals who were new to schools since the Wave 2 data collection received a similar information pack to that received by new principals in Wave 2. Principals then provided details of all reception and year 1 teachers, and their school's liaison person (if it had changed from the previous year), in Week 7 of Term 2. A project launch was considered unnecessary, given schools were already familiar with the project. Consequently, researchers individually delivered project materials in Week 10 of Term 2 (which were very similar to the previous year), and briefly discussed these with each site's liaison person. Sites with small participant numbers were posted their packages, and followed up by telephone. Again, in Week 1, participant lists were cross-

checked to verify all expected participants. Participants that were not attending the expected school were followed up individually through families.

3.3.5 Wave 3 data collection.

The data collection procedures and correspondence materials for parents, teachers from district and 'large' private schools, and teachers at miscellaneous non-district schools were the same as those used in Wave 2. Specifically, parents were mailed surveys and followed up with postcards, letters and phone calls according to the Dillman (2000) method, teachers at participating schools could complete surveys beginning Week 1, and returned them in Week 10, and all other teachers were mailed questionnaires and reply-paid envelopes once their details were known to researchers. While a small number of new questions had been added to teacher questionnaires, they were of a similar format to the original questions. As other previous questions had been removed from questionnaire booklets, the teacher questionnaires took a similar amount of time to complete as those from the previous year.

At the end of data collection, each participating school site received reimbursement for the time taken to complete surveys, a confidential site 'profile report', and a certificate of appreciation. Four participating children were randomly selected as raffle winners of AUD $50 Toys 'R' Us vouchers.

3.4 Statistical considerations

Different statistical analysis approaches are used within each results chapter (i.e., chapters 5 to 9). For this reason, the statistical analyses employed within this thesis are not discussed together within this chapter. Instead, the approaches used to test specific hypotheses are discussed at the beginning of each relevant results chapter, prior to presentation of the actual results.

However, an issue that applies broadly to all results within chapters 5-9 is whether the associations observed between variables can be considered as causal. Several epidemiologists have discussed considerations for causal associations at length (Hill, 1965;

Höfler, 2005; Rothman, Greenland, Poole, & Lash, 2008). Such considerations are now briefly discussed in relation to the associations examined within this thesis.

The only essential (though not sufficient) consideration for establishing whether an association between variables is causal is that of temporal precedence; that is, the independent variable must temporally precede the dependent variable (Hill, 1965; Höfler, 2005). Within this thesis, not all associations between variables meet this consideration. The associations that do not meet temporal precedence are those between variables assessed in preschool (e.g., teacher-child relationships and mental health problems) that are presented in chapters 7-9, and the associations between engagement and school avoidance (both assessed in reception) that are presented in chapter 5. Thus from my results, I cannot confidently suggest that the associations found are likely to be causal.

The use of randomised controlled trials (RCTs) provides the strongest support for considering an association between variables to be causal as, by design, it ensures temporal precedence of the independent variable, and systematically controls for confounding variables (Hill, 1965; Höfler, 2005). There were no RCTs conducted as a part of this thesis. Instead, all data were collected using observational methods. Although some possible confounding variables (e.g., gender, Aboriginal/Torres Strait Islander origin) are adjusted for in analyses, countless other confounding variables may have varied systematically alongside the independent variable, and at least partially explained any observed associations between the independent and dependent variables.

There are several other considerations that, when met, strengthen the case that an association observed between variables is causal. For instance, all hypotheses tested within chapters 5-9 are *consistent* with prior research, *plausible* based on current theory, and *do not contradict* present substantive knowledge (Hill, 1965; Höfler, 2005). If results were to support these hypotheses, then there is stronger evidence that the associations found are causal. Additionally, stronger associations between variables provide greater evidence for causal links than do weaker associations, as they are less likely to be solely a result of biases and confounding. This consideration can be judged as results are presented, and in comparison with effect sizes obtained in previous research.

Finally, the consideration that no alternate explanations exist for the observed associations is not met within this thesis. As I only test one possible model for each association (e.g., teacher-child relationship quality predicts mental health problems), it is quite possible that other models explain the data equally well, if not better (e.g., mental health problems predict teacher-child relationship quality). However, the directions of influence proposed and tested in this thesis are quite plausible, given they are consistent with previous theory and longitudinal research.

By discussing these considerations, I acknowledge that my hypotheses and analyses can neither definitively test nor demonstrate *causal* associations between variables. However, I maintain that statistical support for my hypotheses will provide some evidence to suggest that causal associations are possible, which may provide the impetus for further research involving fully-longitudinal links. In sum, the following results should be interpreted with these considerations in mind.

4

A DESCRIPTIVE EXAMINATION OF THE SAMPLE

The purpose of this brief chapter is to introduce the sample of children who are the focus of this thesis, and to compare their functioning with that of other relevant samples where possible. The same sample of children (n = 575, as detailed in Method section 3.1) were used in analyses of the results described in chapters 5 to 9.

Two particular samples were used as comparisons for several of the demographic variables: (1) relevant sub-groups (e.g., parents of preschool children) from the 2006 Australian Census sample (see Australian Bureau of Statistics, 2007a, 2008a), and (2) the preschool-aged cohort of the Longitudinal Study of Australian Children, a large and nationally representative prospective study (LSAC: Blakemore, 2007; J. Martin, Hiscock, Hardy, Davey, & Wake, 2007; Wake et al., 2008; Zubrick et al., 2008).

4.1 Demographic Characteristics

Baseline demographic information for the current sample was obtained from parent- and teacher-reported questionnaires in Wave 1 (in preschool). On average, children were 4 years and 7 months old (SD = 0.31 years), and had been at preschool for 8.2 months (SD = 3.59 months), when surveyed. There were approximately equal numbers of boys (49%) and girls (51%), similar to state and national levels of preschool and primary school children (Australian Bureau of Statistics, 2007a; Data Analysis Australia, 2007). Only a small percentage of children were of Aboriginal/Torres Strait Islander (ATSI) descent (1.4%). This percentage was lower than the estimated number of 4-year-old Aboriginal/Torres Strait Islander children enrolled in sessional preschool in the district in 2006 (at 3.9%, according to district records), and lower than the percentage of South Australian ATSI preschoolers aged 4 years and older in 2006 (3.7%: Data Analysis Australia, 2007). Although this latter estimate includes children enrolled at both government and non-government preschools, it is unlikely to be very different from the

percentage for government preschoolers only, as the vast majority of South Australian children attend government-funded preschool (86%: Data Analysis Australia, 2007).

Supplementary demographic information was collected from parent- and teacher-reported questionnaires during the remaining two Waves of the study (in reception and year 1). Children's ages differed by approximately one year between assessments: children were 5 years and 7 months (*SD* = 0.31 years) when surveyed in reception, and 6 years and 8 months (*SD* = 0.39 years) when surveyed in year 1. This pattern resulted from the one-year gap between the start of each study wave. Children had been at school for an average of 2.6 terms (*SD* = 1.04) at the reception assessment, and 1 in 5 children were in their first school term (21%). Most children remained in government-funded education following preschool: 76.5% of children in reception, and 76.1% in year 1. These percentages are slightly higher than both state (67%) and national (69%) estimates (Australian Bureau of Statistics, 2007a). However, both of these estimates are not directly comparable to those for the current sample, as they included children in all primary school year levels.

Finally, 21.9% of children were in receipt of a 'school card', which entitled them to reduced school fees due to their families' low income. This figure was lower than the average number of children at each of the Southern Sea and Vines district primary schools with school cards (*M* of district schools = 32.07%). This suggests that the families of children in the current sample were more socio-economically advantaged than families of district school children as a whole.

The parent-reported surveys were completed by mothers for the majority of the sample (91% at both Waves 1 and 2). Mothers and fathers completed surveys together for several children (4.9%), and a number of fathers completed surveys alone (4%). These three respondent groups could not be compared directly on their questionnaire responses, given the very small numbers in the latter two groups. Consequently, it could not be determined whether respondent type had any effect on other variables measured. Hereafter, all of these respondents are grouped together as 'primary caregivers'.

4.2 Preschool Risk Variables

Children's levels of risk in preschool were measured using several variables, reflecting demographic, socioeconomic and psychological risk experienced within children's families. These variables were used further in chapter 6 to assess cumulative risk. However, they are detailed here for purely descriptive purposes (see Table 4.1).

Generally, children had experienced fairly low levels of risk. Approximately 1 in 6 children were living in a single parent family, which was similar to national levels seen among families with a 0-4-year old child (13%), (Australian Bureau of Statistics, 2008a; Wake et al., 2008). Approximately 8% of the sample was born to an adolescent mother (i.e., < 21 years), which was comparable to the percentage of mothers who gave birth as teenagers (i.e., < 20 years) in both South Australia and Australia in 2002 (when most of the current sample was born), at approximately 5% (Australian Bureau of Statistics, 2008a; Pregnancy Outcome Unit, 2003). Additionally, 2% of the sample was born to an adolescent father (i.e., < 21 years), similar to the percentage of Australian teenage fathers (i.e., < 20 years) with a child born in 2002, at approximately 1.5% (Australian Bureau of Statistics, 2008a; Pregnancy Outcome Unit, 2003). It is reasonable to expect slightly higher percentages in the current sample, given that 20 year olds were included in the definition of adolescents (consistent with Kim-Cohen et al., 2004; Moffitt & The E-Risk Study Team, 2002).

Families' employment status was reasonably similar to that of all Australian families with a child aged 0-4 years. Specifically, slightly more families had at least one parent (91% compared with 87-88%) or both parents (45% compared with 42%) employed (Australian Bureau of Statistics, 2008a; Wake et al., 2008). Additionally, more mothers were working part-time (compared with 33-35%), and less were working full-time (compared with 15-19%) (Australian Bureau of Statistics, 2008a; Wake et al., 2008). Furthermore, fewer fathers were unemployed (compared with 18%: Australian Bureau of Statistics, 2008a). Parents were quite well educated compared with South Australian men and women in the same age range, and compared with parents of preschool children. Specifically, more

Table 4.1
Descriptive Statistics for Preschool Risk Variables (n = 575)

Variable	*M* (*SD*) or %
Living in single parent family	15.9%
Mother an adolescent (< 21 years) at child's birth	7.7%
Father an adolescent (< 21 years) at child's birth	2.0%
At least one parent was an adolescent at child's birth	9.2%
Father's employment status:	
Employed full-time	79.6%
Employed part-time	7.9%
Not in paid employment	12.5%
Mother's employment status:	
Employed full-time	9.6%
Employed part-time	42.0%
Not in paid employment	48.3%
Family employment status:	
No parents employed	9.3%
One parent employed	44.6%
Both parents employed	46%
Father's highest education	
Not completed high school or higher	31.1%
Completed high school (year 12 or equivalent)	14.9%
Technical/trade/TAFE qualifications	43.8%
Completed university qualifications	10.2%
Mother's highest educational qualifications	
Not completed high school or higher	25.9%
Completed high school (year 12 or equivalent)	22.5%
Technical/trade/TAFE qualifications	33.4%
Completed university qualifications	18.3%
At least one parent did not achieve at least a high school education	42.9%
Family receives a means-tested pension/benefit	43.5%
Primary caregiver's[a] level of psychological distress (GHQ-12)	1.48 (2.59)
Primary caregiver significantly distressed	40%
Number of stressful life events family experienced in the past 12 months	0.96 (1.23)
0	46.4%
1-2	43.1%
3-8	10.4%

Note. TAFE = technical and further education course.
[a]As previously mentioned, the term 'primary caregiver' refers to the parent survey respondent, with the overwhelming majority as biological mothers.

mothers and fathers had completed high school (compared with 45-60%: Australian Bureau of Statistics, 2007b) and tertiary qualifications (compared with 28-29%: J. Martin et al., 2007).

A large proportion of the sample was receiving some sort of government means-tested pension or benefit. It is not known whether this was their main source of income, but given the high levels of family employment, this possibility was unlikely for most. That a high proportion of the sample was receiving benefits may have been in part due to having young preschool children who needed caring for, and the high percentage of mothers working less than full-time hours.

On average, families had experienced just under one stressful life event in the past 12 months. This estimate is comparable, though smaller, to that for a large national sample of 4-5 year old Australian preschool children (at approximately 1.6 events: Blakemore, 2007). Almost half of the current sample had not experienced any stressful life events in the past year, whereas just under one-third of LSAC children had not experienced any stressful events (31.5%: Zubrick et al., 2008). The most common events were the death of a friend or extended family member (20.3%), and illness or injury to a family member (12.9%). This pattern was consistent with the most commonly-reported events for the LSAC Australian preschool sample, though these events occurred in a lower proportion of the current sample (Zubrick et al., 2008).

Finally, clinical-level psychological distress was experienced by 40% of children's primary caregivers. This is comparable though slightly higher than the experiences of psychological distress reported by a large representative sample of Australians. The distress experienced by the current sample was closer to the estimate for adults attending a doctor or other health practitioner for any reason in the 4 weeks prior to completing the GHQ-12 (41.3% distressed, with a mean GHQ score of 1.28), than to those in the sample that had not attended these clinics (33.3%, and a mean score of 0.93) (Donath, 2001).

4.2.1 Cumulative risk.

Scores on the above risk variables were summed to create two slightly differing measures of cumulative risk: one examined the number of risks, by scoring each individual

risk variable as present/absent (i.e., a dichotomous count); the other examined a finer degree of risk, by retaining the original scoring of variables, which included dichotomous, ordinal and quasi-interval scaling (i.e., a standardised sum). As the analyses that used these indices required full data for all 10 risk variables, the number of children with scores on these variables was reduced to 526. These two measures are discussed in detail in Method section 3.2.1.4. Scores for these two cumulative risk variables are displayed in Figure 4.1.

It can be seen that, on the whole, the sample was characterised by low levels of cumulative risk. Both of the cumulative risk scores were positively skewed, with many children experiencing little to no risk. When examining the dichotomous count variable, 14% of children had experienced no risk. In fact, just over 75% of the sample had experienced one risk factor at most. In contrast, according to the standardised sum variable, no child received the lowest possible score. Consequently, all children were scored as having some degree of risk, even if this was only marginal. However, examining the individual risk variable scores of the children with 'standardised' cumulative risk scores in the bottom 14% (in accordance with the percentage of children that showed no 'dichotomous' risk) showed that the risk these children experienced was minimal. For example, the only degree of risk a child may have experienced was having his/her mother working part-time. The occurrence of this 'risk' in isolation may be less reflective of socio-economic factors, given these children only attend preschool for 11 hours a week, and thus need care and supervision during the day.

4.3 Descriptive Statistics for Main Model Variables

Descriptive statistics for all main model variables used in chapters 5 - 9 are included in Table 4.2. On average, the sample of children had reasonably high mean scores on all variables (indicating good development). Children experienced very high quality relationships with their parents and teachers, which were slightly better than (though

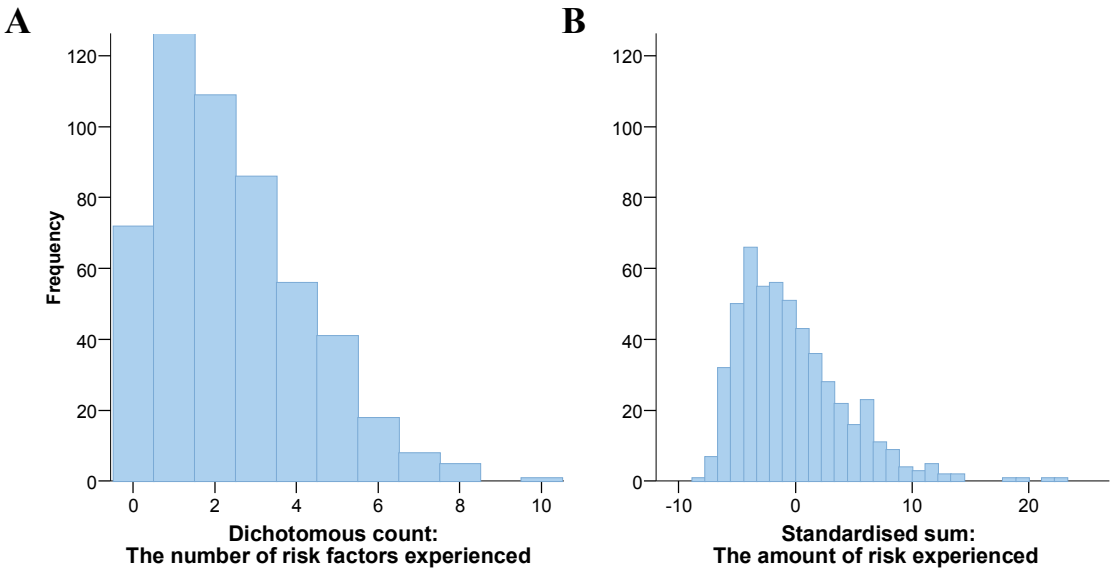


Figure 4.1. Cumulative risk scores (n = 526). Panel A shows the dichotomous risk count, and Panel B shows the standardised risk sum.

comparable to) those reported for other community samples of preschool and early elementary school children (O'Connor, 2010; O'Connor & McCartney, 2007). The children also showed high levels of teacher- and parent-reported self-esteem and self-efficacy, which were comparable (though slightly higher) to community samples of US preschool through to sixth grade children (Fall & McLeod, 2001; H. M. Hughes & Pugh, 1984; Kemple et al., 1996). Children also exhibited low levels of teacher- and parent-reported mental health problems, with mean scores falling in the 'normal' range (see Goodman, 2010) and being comparable to (though slightly lower than) those from a normative Australian sample of 4-year olds (Sawyer et al., 2006). Finally, reception teachers rated children as having high levels of classroom engagement. Other young children are also generally rated by teachers as having high levels of classroom engagement, with mean scores towards the upper end of the scale range (e.g., Fantuzzo, McWayne, Perry, & Childs, 2004; Finn & Pannozzo, 2004; Walker & Berthelsen, 2009a).

4.4 Summary

From this brief description, it can be seen that the current sample was quite well-functioning in most areas of their home and school life. Their demographic characteristics

Table 4.2
Descriptive Statistics for All Process Model Variables (n = 575)

Variable	*M* (*SD*)	Possible score range	Actual score range
	Preschool		
Parent-child relationship (p)	65.40 (6.67)	15-75	43-75
Self-concept (p)	-0.00 (0.91)	-[a]	-3.3-+1.9
Self-efficacy (p)	28.95 (4.02)	9-36	15-36
Self-esteem (p)	55.50 (6.22)	14-70	35-69
Total mental health problems (p)	8.59 (4.76)	0-40	0-24
Hyperactivity/ inattention (p)	3.66 (2.23)	0-10	0-10
Emotional symptoms (p)	1.77 (1.71)	0-10	0-10
Conduct problems (p)	1.67 (1.51)	0-10	0-9
Peer problems (p)	1.49 (1.56)	0-10	0-8
Student-teacher relationship (t)	67.98 (7.89)	15-75	28-75
Self-concept (t)	-0.00 (0.96)	-[a]	-3.4-+1.3
Self efficacy (t)	29.84 (5.34)	9-36	11-36
Self esteem (t)	56.94 (8.64)	14-70	27-70
Total mental health problems (t)	5.46 (5.18)	0-40	0-25
Hyperactivity/ inattention (t)	2.02 (2.51)	0-10	0-10
Emotional symptoms (t)	1.31 (1.87)	0-10	0-10
Conduct problems (t)	0.72 (1.39)	0-10	0-8
Peer problems (t)	1.41 (1.66)	0-10	0-8
	Reception		
School avoidance (p)	7.05 (3.67)	5-25	5-25
School avoidance (t)	0.77 (1.46)	0-12	0-11
Classroom engagement (t) [b]	37.77 (6.39)	14-55.7	16.6-55.7
	Year 1 (*n* = 551)		
School progress (t)	9.03 (3.00)	3-15	3-15
Disciplinary action (t)	3.52 (1.74)	2-10	2-10
School absence/lateness (unexplained) (t)	2.70 (1.34)	2-10	2-9
Classroom absence (t)	1.39 (0.76)	1-5	1-5

Note. (p) = parent-reported variable; (t) = teacher-reported variable.
[a]As this is a standardised variable, it only has an actual score range. [b] The classroom engagement scale was developed in chapter 5, and used for hypothesis testing in subsequent chapters.

were similar to, though slightly 'better' than state and national estimates, and scores on main model variables were similar to, or slightly 'better' than those within other studies of community samples. However, this sample is probably better functioning than the wider South Australian preschool community. This is because families of lower socioeconomic

status that experience associated demographic risk factors are less likely to participate in, and more likely to drop out of, such community samples (Katz, La Place, & Hunter, 2007; Sanders & Cann, 2002, in Watson, 2005).

Despite this sample's overall high functioning, there was reasonable range and variance for many variables. This was especially so for the children's classroom engagement scores, which were more closely normally distributed than scores on the other model variables; though generally doing well, some children showed quite low levels of engagement. Thus, some children within this sample were likely to be having problems adjusting to the school environment, and may have benefited from extra support from parents, teachers and schools. It is for these children especially that it is important to examine what factors may promote their engagement during the first school year.

5

DEVELOPMENT AND VALIDATION OF A MODIFIED CLASSROOM ENGAGEMENT QUESTIONNAIRE

5.1 Introduction

The purpose of analyses within this chapter was to develop the modified Rochester Assessment Package for Schools (RAPS) classroom engagement questionnaire for use among children in their first school year. Though the RAPS is one of the most comprehensive and commonly-used engagement questionnaires, it was not designed for nor has it been validated among 5-year-old school children. Analyses examined the modified 24-item questionnaire's psychometric properties using reception teachers' ratings of the sample. All analyses were guided by engagement theory and research (Connell, 1990; Connell & Wellborn, 1991; Finn, 1989; Fredricks et al., 2004; Wellborn, 1991).

The internal characteristics of this scale were evaluated in several different ways. Firstly, a review of item response distributions examined whether each item could discriminate between children, and whether the items showed a range of responses. Secondly, the degree to which all items clustered meaningfully, and represented a common underlying construct was examined using factor analytic techniques. These two issues were then examined in more detail using Rasch analyses, a technique which, to my knowledge, has not been used to examine the RAPS. Rasch analyses were also used to determine whether scale items were developmentally appropriate for the young children in this sample. As a result of these analyses, a subset of items that had performed well was selected to form the final engagement scale/s.

The internal reliability of the resultant scale/s was examined in two ways. Firstly, internal consistency estimates were used to determine item similarity and construct breadth. Secondly, person and item separation indices within Rasch analyses were used to determine the degree of spread of engagement scores.

Subsequently, external characteristics of the resultant scale/s were examined through associations between engagement scale scores and scores on theoretically-relevant

variables, including gender, socio-economic status, relationships with parents and teachers, and several important school outcomes.

5.1.1 Hypotheses.

The factor structure of this scale has not previously been examined among 5-year-old children. Consequently, no specific hypotheses were made regarding what factor structure would best represent this sample's engagement. However, the interpretability of factors was examined with Self-Systems engagement theory and research in mind.

In relation to the criterion and discriminant validity of the scale, it was hypothesised that classroom engagement in reception would be positively related to:

- child-reported and observed engagement in reception
- school progress in year 1

and negatively related to:

- parent- and teacher-reported school avoidance in reception
- school disciplinary action, absences and lateness in year 1

Additionally, classroom engagement levels were predicted to be higher in girls, and in children from higher socio-economic backgrounds.

5.2 Preliminary Considerations

The results from preliminary analyses conducted to assess preconditions of factor and Rasch analyses are reported in Appendix D. In sum, these results showed that assumptions were largely met, suggesting that it was reasonable to proceed with the main statistical analyses.

It is important to note that while teachers completed the 24-item engagement questionnaire for 575 reception children, only 547 children had all 24 items in the questionnaire completed. It is the scores of these 547 children that are subject to analysis here. As discussed in Appendix D, this missing data excluded less than 5% of the sample from these analyses, and there were few substantive differences between children with (n = 547) and without (n = 28) full engagement scale data.

5.3 Results

5.3.1 Item Response Distributions

Means and standard deviations and observed minimum and maximum values of the engagement item raw scores are shown in Table 5.1. These 24 items are grouped as indicators of behavioural, emotional, and cognitive engagement, as according to previous research (see Fredricks et al., 2004). Item responses ranged from 1 (*never*) to 5 (*always*). However, the data for all negatively worded items were reversed prior to analyses, so for these items, a rating of 1 corresponded to the label *always*, so for all items, a higher score is more desirable. Variable names are written in full in Table 5.1, but abbreviated for parsimony thereafter. It can be seen that the full range of response options was used for all items except 'appears happy', where the *never* response option was not used.

A basic analysis of the response distributions for the 24 engagement questionnaire items was conducted in three steps. First, item distributions were visually inspected for skewness and kurtosis. Many item response distributions were mildly skewed (mostly negatively), as seen in their mean scores in Table 5.1, and in the histograms in Figure E1 of Appendix E. However, for most items, this skew was not substantial. The one exception was the distribution for 'appears angry', which was quite negatively skewed. The item distributions that resembled a normal curve included the majority of the indicators of cognitive engagement, along with several of the indicators of behavioural engagement. Moreover, none of the questionnaire item distributions showed substantial kurtosis.

Second, the proportion of teachers that endorsed each of the five response categories was examined for each item. It was important to ascertain if, for any item, one response category had an extremely high rate of endorsement. This is because items that are answered similarly by all, or almost all, respondents convey no information about

Table 5.1
Descriptive Information for Each Engagement Scale Item (n = 547)

Variable	*M* (*SD*)	Observed Min	Observed Max	Skewness (SE)	Kurtosis (SE)
Behavioural engagement (10 items)					
1. Participates actively in discussions	3.67 (1.06)	1	5	-0.47 (0.10)	-0.49 (0.20)
2. Pays attention	4.04 (0.89)	1	5	-0.77 (0.10)	0.23 (0.20)
3. Does more than required	3.16 (1.09)	1	5	0.10 (0.10)	-0.64 (0.20)
4. Loses/misplaces his/her belongings (r)	3.81 (1.01)	1	5	-0.70 (0.10)	0.18 (0.20)
5. Concentrates on doing his/her work	3.38 (0.97)	1	5	-0.58 (0.10)	-0.27 (0.20)
6. Listens carefully	3.95 (0.91)	1	5	-0.60 (0.10)	-0.01 (0.20)
7. Does just enough to get by (r)	3.43 (1.02)	1	5	-0.16 (0.10)	-0.56 (0.20)
8. Tries hard	4.04 (0.84)	1	5	-0.50 (0.10)	-0.19 (0.20)
9. Sticks with difficult tasks	3.50 (0.97)	1	5	-0.28 (0.10)	-0.35 (0.20)
10. Does the best that he/she can	3.99 (0.79)	1	5	-0.50 (0.10)	0.23 (0.20)
Emotional engagement (8 items)					
11. Appears interested	4.09 (0.82)	1	5	-0.73 (0.10)	0.42 (0.20)
12. Appears frustrated (r)	4.02 (0.78)	1	5	-0.46 (0.10)	-0.02 (0.20)
13. Appears enthusiastic	3.95 (0.84)	1	5	-0.42 (0.10)	-0.40 (0.20)
14. Appears bored (r)	4.14 (0.79)	1	5	-0.64 (0.10)	0.25 (0.20)
15. Appears happy	4.14 (0.70)	2	5	-0.65 (0.10)	0.68 (0.20)
16. Appears angry (r)	4.47 (0.76)	1	5	-1.40 (0.10)	1.99 (0.20)
17. Appears worried (r)	3.88 (0.87)	1	5	-0.36 (0.10)	-0.35 (0.20)
18. Appears sad (r)	4.13 (0.80)	1	5	-0.62 (0.10)	0.03 (0.20)
Cognitive engagement (6 items)					
19. Prefers activities which he/she already knows how to do (r)	2.58 (0.90)	1	5	0.52 (0.10)	0.39 (0.20)
20. Depends on me to make decisions regarding his/her work (r)	3.34 (1.03)	1	5	-0.14 (0.10)	-0.58 (0.20)

Table 5.1 cont.
Descriptive Information for Each Engagement Scale Item (n = 547)

Variable	*M* (*SD*)	Observed Min	Observed Max	Skewness (SE)	Kurtosis (SE)
Cognitive engagement (6 items)					
21. Prefers doing activities that are easy for him/her (r)	2.82 (0.95)	1	5	0.25 (0.10)	-0.14 (0.20)
22. Is unwilling to change his/her approach to solving problems, even when it isn't working (r)	3.65 (0.92)	1	5	-0.48 (0.10)	-.03 (0.21)
23. Likes to figure things out for him/herself	3.41 (0.90)	1	5	-0.15 (0.10)	-0.33 (0.20)
24. Copes positively (tries harder the next time) when he/she doesn't do well on a task	3.70 (0.86)	1	5	-0.30 (0.10)	-.33 (0.20)

Note. Scores from item responses could range from 1 to 5 (or *never* to *always* for the positively worded items). (r) = item was reversed prior to analyses.

individual differences (Anastasi & Urbina, 1997; L. A. Clark & Watson, 1995; Streiner & Norman, 1995). As there is no set benchmark for an 'extremely high' endorsement rate, Streiner and Norman's (1995) general guide of a rate of 80% or higher was followed. The item response distributions (see Figure E1 of Appendix E) showed that no response category had an extremely high endorsement rate for any of the questionnaire items.

Generally, the most endorsed response category for each item was endorsed by 35 to 45% of the teachers. The item with the most highly endorsed response category (*never*) was 'appears angry', endorsed by 61% of the teachers. Overall, responses on this item could still distinguish between some children.

These points considered, it is useful for a scale to have *some* items with skewed response distributions and/or one highly endorsed response category, as long as they are able to discriminate between some children. This is because scales need items that discriminate between children at various levels of the underlying continuum (presumed to be engagement, in this case). For example, assuming the current sample is not terribly different from the wider population, items that very few children are rated highly on are

likely to measure a very high level of engagement[11], and thus are able to distinguish the few extremely engaged children from the rest. So as a third step, all of the item distributions were visually examined alongside each other, to determine if they showed a range of different distribution patterns (see Figure E1 of Appendix E). Examined together, the items showed a range of response distribution patterns, and discriminated between children at various points along the engagement continuum. However, no item response distribution showed high positive skew, where most children received low to moderate scores (i.e., few children received *never* or *rarely* ratings on the positively worded items). In other words, there were few items that were extremely difficult for children to receive high ratings for, and therefore few items discriminating the most extremely engaged children from the rest.

However, in developing a scale with high discrimination ability, it is not simply enough to have a wide range of response distribution patterns for the scale items. This is because items belonging to the same scale tend to be intercorrelated to some degree. When items are highly correlated, there is a reasonably high probability that children who receive a high score (corresponding to a rating of *always*) on one item, for example, will receive the same rating on the other scale items. If too many items are highly correlated in this manner, then not only would these children's total scores be indistinguishable from one another, but the scale would show a ceiling effect, with total scores clustered at the upper end of the distribution. Thus, it is also extremely important to examine the correlation between item responses, and the pattern of item responses within and between children. As described in section 5.3.3, these more detailed analyses were conducted within Rasch analyses (once scale dimensionality had been ascertained through factor analysis, and items showing poor performance were eliminated).

5.3.2 Factor Analysis

The dimensionality of the 24-item engagement questionnaire was examined to determine how the indicators of engagement clustered meaningfully among young

[11] Given that the distributions for most characteristics/traits/behaviours etc. resemble a normal curve

children, and whether all items were strong measures of the underlying latent construct/s identified. For this purpose, a series of exploratory factor analyses of the correlation matrix using Maximum Likelihood methods of extraction was conducted. Exploratory rather than confirmatory analyses were chosen, because the structure of the engagement construct has not yet been critically examined among children in their first school year. The existing theoretical and empirical information regarding the factor structure of engagement (i.e., behavioural, emotional and cognitive engagement, see Connell, 1990; Connell & Wellborn, 1991) was developed for, and tested among older children, in upper primary and middle school year levels. Thus, the purpose here was not to confirm the structure seen among older children, but to investigate how engagement is manifested among 5-year-old children new to school. However, the interpretability of factors was examined with theoretical and empirical engagement information in mind.

A 'common factors' rather than 'principal components' model was used, as the goal was not simply data reduction, but the identification of latent variables. Maximum Likelihood was chosen due to its sensitivity in detecting problems in data, such as Heywood cases[12], further aiding in identifying and rectifying problematic solutions (Fabrigar, Wegener, MacCallum, & Strahan, 1999). Item loadings of less than .30 were suppressed.

A number of preliminary assumptions for the use of Exploratory Factor Analysis using Maximum Likelihood methods of extraction were first tested. Any questionnaire items that failed to meet assumptions were noted; however the first EFA was run with all 24 items, to assess all performance aspects of each item. Only subsequently were any poorly performing items eliminated. See Appendix D for the results of these preliminary investigations.

Questionnaire data came from ordinal level scales. However, factor analyses were based on the parametric Pearson product-moment correlation matrix, following Jaccard and Wan's (1996) assertion that data only need to *approximate* interval level characteristics for parametric testing. As distributions for each scale item, and for the total engagement

[12] impossible solutions with variable communalities ≥ 1

scale, approximated normal interval distributions, the Pearson correlation matrix was able to be used (Comrey & Lee, 1992; Floyd & Widaman, 1995; J.-O. Kim & Mueller, 1978; Zumbo & Zimmerman, 1993).[13]

Factor solutions were subject to oblique promax rotation, given multiple factors were expected to be conceptually related. If extracted factors were orthogonal, this could be identified by the resultant low factor correlations (Comrey & Lee, 1992; Floyd & Widaman, 1995). The SPSS default kappa of 40 was used, allowing factors to be moderately correlated with one another.

Several criteria were used to determine the number of factors to extract: (1) the Kaiser criterion, (2) the scree test, (3) parallel analysis, (4) the amount of variance explained, and (5) interpretability of rotated solutions. Where results conflicted, more weight was placed on parallel analysis as it is considered the most accurate extraction method (Zwick & Velicer, 1986). Ultimately, a range of possible factor solutions were rotated, and the existence of simple structure and sensible interpretation of factors guided the final dimensionality decision.

Following EFA with all 24 items, poorly performing items were eliminated. Several criteria were used in the decision to remove items. Heywood cases, and items that (1) did not load strongly (i.e., ≥ .40) on any extracted factors, (2) were inconsistent in the factors that they loaded on across iterations, (3) showed high cross-loadings, and (4) showed low communalities were considered for elimination. Additionally, elimination of one or more redundant variables was considered if a variable (1) correlated highly (i.e., ≥ .80) with another variable, (2) showed poor collinearity indices, and (3) added little to factor/scale interpretation.

Consequently, several iterations of factor analysis were conducted, each after removal of items for various reasons as outlined above. The initial 24 items were cut incrementally to 22, 19, and then finally to 17 items. While the reasoning for eliminating items at each step is described, only full analysis details are provided for the initial 24-item and final 17-item scales for the sake of parsimony.

[13] In any case, correlation coefficients are fairly robust against ordinal distortions in the measurement (Jaccard & Wan, 1996; J.-O. Kim & Mueller, 1978).

Table 5.2

Correlations between All Engagement Questionnaire Items (n = 547)

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Behavioural engagement																							
1. Participates	-																						
2. Attention	**.45**	**-**																					
3. More than required	**.50**	**.71**	**-**																				
4. Loses belongings	**.20**	**.54**	**.47**	**-**																			
5. Concentrates	**.36**	**.81**	**.73**	**.53**	**-**																		
6. Listens	**.38**	**.86**	**.68**	**.55**	**.80**	**-**																	
7. Does just enough	**.37**	**.55**	**.67**	**.42**	**.60**	**.55**	**-**																
8. Tries hard	**.44**	**.74**	**.71**	**.48**	**.75**	**.70**	**.63**	**-**															
9. Sticks with tasks	**.47**	**.71**	**.73**	**.54**	**.75**	**.70**	**.63**	**.72**	**-**														
10. Does best as can	**.39**	**.66**	**.65**	**.46**	**.70**	**.65**	**.64**	**.80**	**.70**	-													
Emotional engagement																							
11. Interested	.67	.77	.67	.43	.63	.68	.54	.69	.67	.61	-												
12. Frustrated	.24	.50	.43	.48	.44	.47	.35	.45	.48	.46	**.41**	**-**											
13. Enthusiastic	.63	.62	.64	.36	.60	.57	.52	.65	.64	.61	**.73**	**.40**	**-**										
14. Bored	.37	.60	.52	.33	.53	.56	.45	.61	.54	.57	**.60**	**.46**	**.58**	**-**									
15. Happy	.49	.43	.43	.31	.35	.39	.35	.46	.46	.49	**.54**	**.44**	**.62**	**.50**	**-**								
16. Angry	.17	.47	.36	.38	.41	.44	.30	.39	.39	.44	**.37**	**.61**	**.35**	**.49**	**.44**	**-**							
17. Worried	.38	.28	.30	.24	.24	.28	.28	.29	.37	.34	**.38**	**.45**	**.42**	**.34**	**.57**	**.38**	**-**						
18. Sad	.38	.28	.29	.27	.27	.27	.26	.32	.37	.36	**.41**	**.41**	**.43**	**.36**	**.59**	**.44**	**.69**	-					
Cognitive engagement																							
19. Prefers known	.37	.37	.46	.33	.35	.37	.43	.37	.45	.37	.41	.37	.38	.32	.30	.23	.35	.31	-				
20. Depends on me	.49	.50	.60	.41	.52	.47	.53	.55	.61	.53	.52	.48	.52	.40	.39	.30	.40	.37	**.50**	**-**			
21. Prefers easy	.41	.54	.58	.40	.53	.53	.55	.55	.63	.52	.52	.43	.50	.41	.34	.34	.40	.32	**.65**	**.62**	**-**		
22. …problem-solving	.29	.40	.37	.35	.37	.40	.40	.38	.41	.38	.35	.42	.36	.34	.29	.39	.35	.30	**.28**	**.38**	**.40**	**-**	
23. figuring out alone	.51	.54	.61	.38	.53	.49	.52	.55	.66	.55	.59	.42	.58	.38	.44	.28	.43	.44	**.49**	**.63**	**.60**	**.37**	**-**
24. Copes positively	.44	.58	.60	.48	.60	.60	.55	.64	.71	.66	.59	.47	.61	.50	.50	.45	.41	.43	**.40**	**.56**	**.52**	**.44**	**.60**

Note. All correlations significant at $p < .001$. Intra-component correlations in bold type. All negatively-worded items were reversed prior to analyses.

5.3.2.1 Factorability of the correlation matrix.

Factorability of the correlation matrix was verified by the many moderate to large inter-item correlations, with the majority in the range of .30 to .70 (see Table 5.2). From this visual inspection alone, there were ample moderate-large correlations to proceed with factor analysis. Moreover, the Kaiser-Meyer-Olkin (KMO) index was .96, well above the recommended value of .60 (Kaiser, 1974), indicating a very high degree of common variance amongst variables. Also, Bartlett's Test was highly significant, $\chi^2 = 10193.70$ (276), $p < .001$, rejecting the null hypothesis of an identity matrix.

Conversely, several large inter-item correlations (in the range of .70 to .90) and an exceedingly small correlation matrix determinant value ($p < .00000001$) suggested some degree of multicollinearity, and so redundancy in the data. Due to this, collinearity statistics in the form of tolerance and variance inflation factor (VIF) indices were calculated for each item using ordinary least squares regression. Tolerance values < .2, and VIF values > 4 were considered problematic. Using these indices, five items showed evidence of multicollinearity: 'pays attention' (6.20), 'concentrates' (4.53), 'listens' (4.75), 'tries hard' (4.20) and 'appears interested' (4.38) showed substandard VIF values, and 'pays attention' also showed a substandard tolerance value (of 0.16). These results indicated an opportunity to remove some variables, and so create a more parsimonious scale, without the loss of content validity.

5.3.2.2 Intra-component correlations.

Results presented in Table 5.2 show several large correlations between items that some researchers consider as belonging to different subscales (i.e., emotional, behavioural and cognitive subscales, see Fredricks et al., 2004).

Firstly, two items that are often considered as indicators of emotional engagement[14], 'interested' and 'enthusiastic', correlated at above .60 with the majority of behavioural items; these correlations being higher than their correlations with the other emotional items, which ranged approximately from .30 to .60. This pattern did not appear

[14] Common indicators of emotional engagement are discussed at length by Fredricks and colleagues (2004).

to be due to similar difficulty levels between 'interested' and 'enthusiastic' and the behavioural items, on visual inspection of the item distributions. However, this finding is consistent with Connell and Wellborn's view that 'interest' items tapped more behavioural than emotional engagement (Connell, 1990; Connell & Wellborn, 1991), and closely parallels Zimmer-Gembeck and colleagues' (2006) findings, where the item 'appears bored' loaded with indicators of behavioural disengagement within exploratory factor analyses of the RAPS.

Secondly, the behavioural item 'sticks with difficult tasks' and the cognitive item 'copes positively with failure' correlated quite highly with cognitive and behavioural items respectively, and with each other, suggesting both cognitive and behavioural elements within these items.

5.3.2.3 24-item iteration.

Factor analysis of the 24 items identified four factors with eigenvalues over 1; Factor 1 had an eigenvalue of 12.34, accounting for 51.4% of variance, Factor 2 had an eigenvalue of 1.81, accounting for 7.54% of variance, Factor 3 had an eigenvalue of 1.38, accounting for 5.75% of variance, and Factor 4 had an eigenvalue of 1.19, accounting for 4.95% of variance. Additionally, the scree plot (see Figure 5.1) showed the largest drop in slope between the first and second factors. However, a possible second minor elbow was seen after the fourth factor.

Parallel analyses (Horn, 1965; Montanelli & Humphreys, 1976) of principal components[15] were conducted with random data eigenvalues averaged from 1000 raw data matrices, generated using permutations of the original raw data set. The corresponding scree plot (see Figure 5.1) generated suggested that up to three real data factors with eigenvalues exceeding those occurring by chance be retained; however, the eigenvalue of the third factor was very close to the corresponding random data eigenvalue. Both the mean and the 95th percentile of the random data eigenvalues showed very similar results.

[15] Using random principal components is recommended as data are drawn from an identity matrix and are free from measurement error (Hayton, Allen, & Scarpello, 2004).

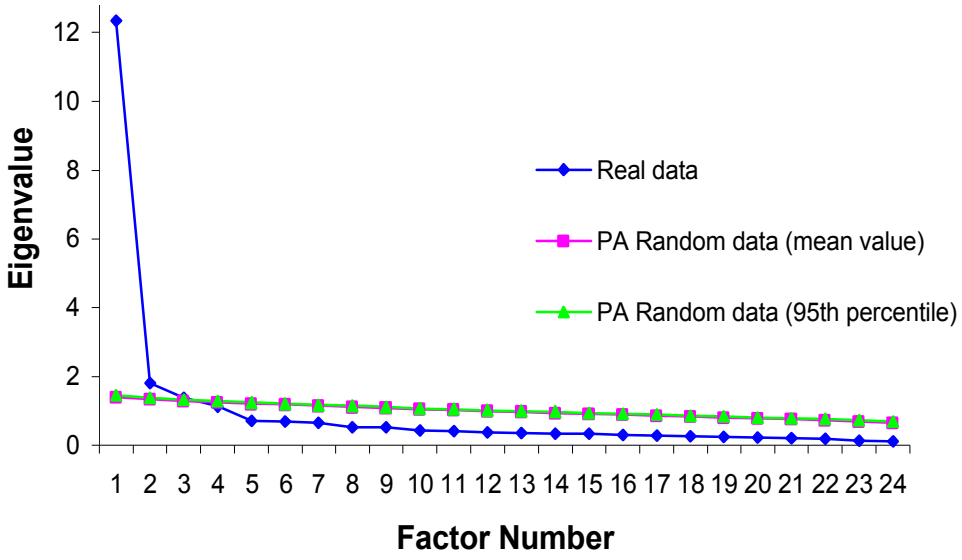


Figure 5.1. Scree plot from parallel analysis of the 24-item engagement scale.

As (1) the scree plot and Kaiser criterion suggested one major factor and up to three minor factors, and (2) previous research has shown the existence of three correlated subcomponents, as well as a unidimensional higher-order factor on which all items load (Wellborn, 1991), both a unidimensional scale *and* up to four correlated factors were examined at each iteration. As it happened, all four-factor solutions were weak and uninterpretable, and so are not reported here. Multiple factors were examined as a possible useable factor structure, but also as a theoretical exercise to extricate distinct subcomponents of engagement within the current sample. Furthermore, looking at multiple factors helped with interpretation, and gave deeper insight as to where items may not be behaving sensibly. As items can artificially load on a unitary factor when forced to, extracting multiple factors allows the exploration of exactly which items freely 'hang together' and if items clearly do not belong together when allowed to separate out (Comrey & Lee, 1992).

In the one-factor solution (Table 5.3), all items showed moderate to strong loadings (.47 to .86), but nine items showed low communalities (< .40, see Fabrigar et al., 1999), including most of the emotional engagement items. Those with the communalities below .40 showed the lowest loadings (.47 to .60). In the two-factor solution, only five

Table 5.3
One-Factor Exploratory Factor Analysis Solution for the 24-Item Engagement Questionnaire (n = 547)

Variable	Factor loading I	h^2
Sticks with difficult tasks	**.86**	.74
Pays attention	**.85**	.72
Tries hard	**.84**	.71
Concentrates on work	**.83**	.69
More than required	**.83**	.69
Listens carefully	**.82**	.67
Does the best that can	**.81**	.66
Interested	**.81**	.66
Enthusiastic	**.77**	.59
Copes positively when doesn't do well	**.76**	.58
Does just enough to get by	**.73**	.53
Likes to figure out for oneself	**.72**	.51
Prefers easy activities	**.69**	.48
Depends on me	**.69**	.47
Bored	**.68**	.46
Happy	**.60**	.36
Frustrated	**.59**	.35
Loses/misplaces belongings	**.59**	.35
Participates	**.58**	.33
Prefers known activities	**.54**	.29
Angry	**.52**	.27
Unwilling to change problem-solving	**.50**	.25
Sad	**.49**	.24
Worried	**.47**	.22
Percentage variance	51.4	
Eigenvalue	12.34	

Note. Loadings ≥ .40 in bold type. h^2 = communality coefficient. All negatively-worded engagement items were reversed prior to analyses.

items showed low communalities (see Table 5.4). The two factors accounted for cognitive-behavioural, and emotional items, respectively. Factor 1 had 16 pure loadings ranging from .45 to .97 and no cross-loadings, but 'concentrates' was a Heywood case. Also, two items failed to load strongly - 'prefers already-known activities' and 'unwilling to change problem-solving'. Only three of the five basic emotional items loaded strongly on the second factor, along with 'participates' (loadings from .40 to .92). The items 'frustrated' and 'angry' loaded too weakly on this factor to aid in interpretation. The two factors were

Table 5.4
Two-Factor Exploratory Factor Analysis Solution for the 24-Item Engagement Questionnaire (n = 547)

	Factor loading		
Variable	I	II	h^2
Concentrates on work	**1.003**		.79
Pays attention	**.97**		.79
Listens carefully	**.97**		.75
Tries hard	**.86**		.73
More than required	**.83**		.70
Sticks with difficult tasks	**.77**		.73
Does the best that can	**.75**		.65
Does just enough to get by	**.71**		.53
Interested	**.67**		.66
Loses/misplaces belongings	**.57**		.35
Copes positively when doesn't do well	**.54**		.60
Bored	**.53**		.47
Enthusiastic	**.52**	.34	.61
Prefers easy activities	**.51**		.48
Depends on me	**.45**	.31	.49
Likes to figure out for oneself	**.45**	.36	.54
Unwilling to change problem-solving			.26
Prefers known activities			.30
Worried		**.92**	.65
Sad		**.90**	.64
Happy		**.69**	.56
Participates		**.40**	.38
Frustrated	.31	.38	.40
Angry		.35	.32
Percentage variance			
Pre-rotation	51.4	7.54	
Post-rotation	49.38	6.22	
Eigenvalue	12.34	1.81	

Note. Loadings ≥ .40 in bold type, loadings < .30 suppressed. All negatively-worded engagement items were reversed prior to analyses. h^2 = communality coefficient. Factors were correlated at .64.

correlated at .64. In the three-factor solution (Table 5.5), only three items showed low communalities, and showed good simple structure and 'overdetermined' factors[16] that corresponded with the three engagement subcomponents mentioned in the literature (i.e., behavioural, cognitive, and emotional engagement). However, the first and second factors

[16] Factors that are represented by a substantial number of high factor loadings, generally at least three or four (Comrey & Lee, 1992).

Table 5.5
Three-Factor Exploratory Factor Analysis Solution for the 24-Item Engagement Questionnaire (n = 547)

	Factor loading			
Variable	I	II	III	h^2
Listens carefully	**1.003**			.82
Pays attention	**1.002**			.86
Concentrates on work	**.84**			.78
Tries hard	**.61**	.32		.71
Bored	**.56**			.50
Interested	**.53**			.66
Loses belongings	**.48**			.35
Does the best that can	**.48**	.36		.64
Unwilling to change problem-solving				.26
Depends on me		**.76**		.58
Likes to figure out for oneself		**.75**		.62
Prefers easy activities		**.70**		.56
Prefers known activities		**.69**		.39
Does just enough to get by		**.63**		.59
More than required	**.44**	**.55**		.73
Sticks with difficult tasks	**.40**	**.54**		.75
Participates		**.50**		.40
Copes positively when doesn't do well		**.42**		.60
Enthusiastic		.39		.61
Sad			**.86**	.69
Worried			**.78**	.65
Happy			**.65**	.59
Angry	**.50**	-.32	**.52**	.46
Frustrated	.35		**.42**	.44
Percentage variance				
Pre-rotation	51.4	7.54	5.75	
Post-rotation	49.32	6.41	3.62	
Eigenvalue	12.34	1.81	1.38	

Note. Loadings ≥ .40 in bold type, loadings < .30 suppressed. All negatively-worded engagement items were reversed prior to analyses. h^2 = communality coefficient. Factors I and II correlated at .75, Factors I and III correlated at .53, and Factors II and III correlated at .59.

(broadly, behavioural and cognitive engagement, respectively) showed several cross-loadings, and correlated at .75. It appeared that these two factors measured the same underlying construct, and should be combined. This would also suggest that two factors (i.e., cognitive-behavioural engagement, and emotional engagement, respectively) would be a more appropriate factor solution. Also, the presence of two Heywood cases, 'attention'

and 'listens', suggested that a different factor solution might represent the data better (Fabrigar et al., 1999). These two items already had the potential to be eliminated, due to their previously mentioned collinearity, and their Heywood status may have been reflecting this assumption violation (Fabrigar et al., 1999). Additionally, two items failed to load strongly on any factor - 'enthusiastic' and 'unwilling to change problem-solving'.

From these results, five items that performed poorly in all factor solutions were removed to reduce redundancy and improve model fit. Two of the three observed Heywood cases ('pays attention' and 'concentrates') were removed; these were chosen as they had the highest correlations with all other items. Item wording reflected this redundancy, so their removal was not seen to compromise content validity. The resulting large increase in the determinant, whilst remaining below the acceptable threshold, reflected this redundancy. Another factor analysis iteration examining one-, two- and three-factor solutions was performed to allow other poorly performing items a 'second chance' without the influence of Heywood cases; however, 'prefers known activities' and 'unwilling to change problem-solving' still failed to load strongly (i.e., ≥ .40) on any factor, for any of the factor solutions. The item 'participates in discussions' also showed low communalities, and did not load sensibly or consistently, loading with different and unrelated items in different factor solutions. This item tended to load with 'enthusiastic' and 'interested', and correlated most highly with these two variables. As the wording of this item referred not to participation in general, but in relation to classroom discussions, this item may have inadvertently tapped more of an extroverted motivation orientation rather than participation per se. Consequently, these three items were removed, and the next iteration was performed on the remaining 19 items, which is briefly reported here.

5.3.2.4 19-item iteration.

Results of the 19-item iteration identified only three factors using the Kaiser criterion (with eigenvalues of 10.06, 1.65 and 1.08, explaining 52.95%, 8.67% and 5.68% of the variance, respectively). Additionally, the scree plot suggested one to two factors. Parallel analysis suggested that, at most, two factors should be extracted.

A two-factor scale presented the most interpretable solution. Though all items loaded moderately to strongly (from .48 to .86) on a unidimensional factor, six items had low communalities, five of which were theoretically 'emotional' items, though these items still loaded from .48 to .62. A three-factor solution broadly produced cognitive, behavioural and emotional factors, again with considerable overlap between cognitive and behavioural factors (i.e., small cross-loadings, and some behavioural items loading on the cognitive scale, and vice versa), suggesting a two-factor solution may be more appropriate. The .75 correlation between first and second factors highlighted this overlap.

The clearest simple structure was seen in the two-factor solution, with all cognitive and behavioural items uniting in the first factor (thereby eliminating most cross-loadings), with 14 pure loadings ranging from .57 to .93. This factor was predominated by behavioural items, and also included the three 'motivational' emotion items. The second factor consisted of the 'basic' emotional items, with four pure loadings, ranging from .40 to .92. 'Frustrated' showed the only cross-loading. These two factors were correlated at .61, which, though reasonable in magnitude, suggested the factors were better kept distinct. This was also reflected in the substantial improvement of several of the emotional items' communalities.

5.3.2.5 17-item iteration.

While the previous 19-item 2-factor scale showed good simple structure, solid loadings, and sensible interpretation, a final iteration was performed after eliminating 'tries hard' and 'interested'. This was done to further reduce item redundancy and multicollinearity. Both of these items showed high intercorrelations with other items. Both of these variables also showed high VIF values. Eliminating these two items saw the determinant further increase, and to an acceptable value ($p > .00001$).

For the final 17 items, the scree plot (Figure 5.2) suggested one elbow at the second factor. There were now only three eigenvalues greater than 1: the first factor had an eigenvalue of 8.79, explaining 51.68% of the variance, the second factor had an eigenvalue of 1.58, explaining 9.31% of the variance, and the third factor had an

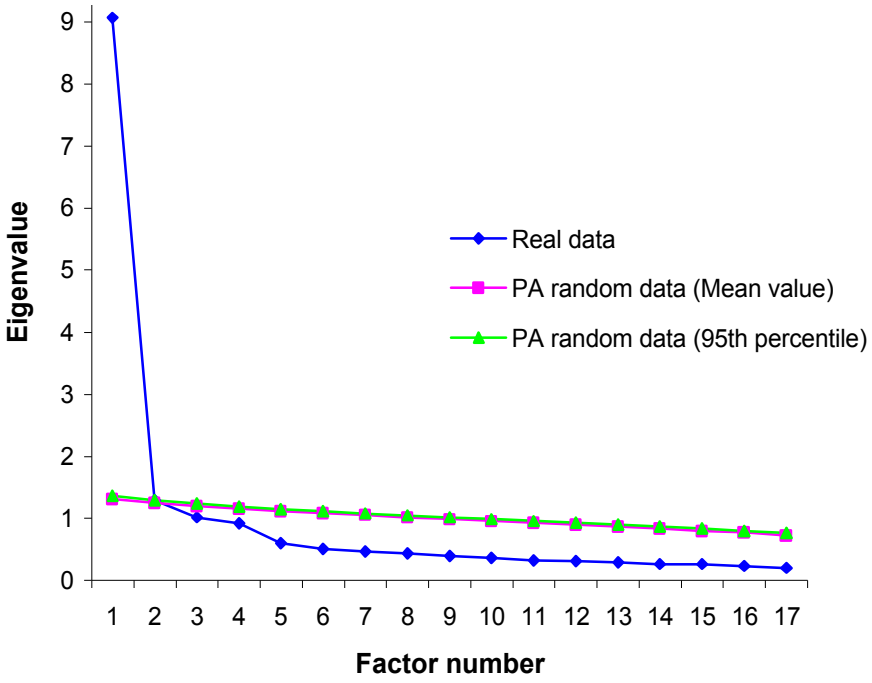


Figure 5.2. Scree plot from parallel analysis of the final 17-item engagement scale.

eigenvalue of 1.07, explaining 6.28% of the variance. Additionally, results of parallel analysis suggested extracting at most two factors (see Figure 5.2).

As before, a two-factor solution showed the best simple structure (see Table 5.6). Unlike the 3- factor alternative, both factors were overdetermined and there was only one cross-loading. The performance of a unidimensional scale in this final iteration was carefully considered (see Table E1 in Appendix E), given that constructs that are found to be multidimensional among older children are often undifferentiated among younger children (e.g., self-concept, see discussion in sections 2.3.3 and 2.3.4.3). However, as with all of the previous one-factor iterations, most of the emotional items had unacceptable communalities, whereas for the two-factor scale, most had acceptable communalities.

For the two-factor solution, the first factor was overdetermined and consisted of all the remaining cognitive and behavioural items, and also 'bored', and 'enthusiastic', with 12 pure loadings ranging from .53 to .94. The second factor was also overdetermined, and consisted of the remaining emotional items, with four pure loadings ranging from .41 to .93. 'Sad', 'worried' and 'happy' dominated the emotional factor, and 'more than required',

Table 5.6
Two-Factor Exploratory Factor Analysis Solution for 17-Item Engagement Questionnaire (n = 547)

	Factor loading		
Variable	I	II	h^2
More than required	**.94**		.73
Sticks with difficult tasks	**.89**		.77
Listens carefully	**.84**		.62
Does just enough to get by	**.82**		.56
Does the best that can	**.80**		.65
Copes positively when doesn't do well	**.70**		.62
Prefers easy activities	**.67**		.49
Depends on me	**.64**		.51
Likes to figure out for oneself	**.62**		.54
Enthusiastic	**.60**		.58
Loses/misplaces belongings	**.59**		.35
Bored	**.53**		.44
Frustrated	.34	**.37**	.42
Sad		**.93**	.73
Worried		**.86**	.65
Happy		**.63**	.56
Angry		**.41**	.35
Percentage variance			
Pre-rotation	51.68	9.31	
Post-rotation	49.15	7.12	
Eigenvalue	8.79	1.58	

Note. Loadings ≥ .40 in bold type, loadings < .30 suppressed. All negatively-worded engagement items were reversed prior to analyses. h^2 = communality coefficient. Factors were correlated at .62.

'sticks with difficult tasks' and 'listens' dominated the cognitive-behavioural factor. The two factors correlated at .62.

As this 17-item 2-factor solution performed well and was clearly interpretable, no more factor analysis iterations were performed, and these two factors were used in subsequent analyses.

5.3.3 Rasch Analysis

Data from the two engagement subscales identified through exploratory factor analysis were fitted to the Rasch partial credit model (Masters, 1982) using *Quest* software

(Adams & Khoo, 1996). In examining item fit to the Rasch measurement model, each factor was treated as a unidimensional construct.[17]

The Rasch model is a probabilistic measurement model that may be applied to Likert categorical data to provide interval-level measurement. Rasch analysis builds upon the previous analyses, as it provides a more sophisticated treatment of issues regarding the structure of factors, and score discrimination. Firstly, Rasch analyses provide fit statistics for each item in the form of infit mean square (MS) values, which assess the extent to which the questionnaire data fit the Rasch model and thus can help identify potentially problematic items. Infit MS values are the unstandardised averages of the squared residuals for each item - therefore showing the amount of deviation from the ideal Rasch measurement model. The infit MS values have an expected value of 1.0. If the data fit the model, the infit MS values should not deviate far from 1.0. However, as the Rasch model is probabilistic and not deterministic, some failure of the model to predict the observed values is expected. Given the current context of applied research and sample size, any engagement items with infit MS values outside the range of 0.70 to 1.30 were considered potentially problematic and were examined further. An item with infit MS value significantly greater than 1.0 is usually not as discriminating as other scale items. Conversely, an item with an infit MS value significantly less than 1.0 is usually more discriminating than the other scale items.

Furthermore, Rasch analyses were also used to determine if the engagement items that were originally designed for older children (1) measured the full range of engagement levels reported for these 5-year-olds, and (2) accurately distinguished the engagement levels of different children. These issues can be examined within Rasch analyses, as both the overall engagement scores of the children and the individual engagement scores measured by the items are estimated on the same logit (log odds units) scale. These estimates are then displayed together within a 'person-item map'. Thus, the person and

[17] In subsidiary analyses, the two (cognitive-behavioural and emotional) engagement factors were Rasch-analysed together as a unidimensional construct (see Table E2 in Appendix E). This was to carefully consider the possibility that these factors were not differentiated among young children, as was previously examined within factor analysis in section 5.3.2.5. However, better scale proporties were observed when analysed as two separate factors (compared Tables E2, 5.7 and 5.9). Thus, the remainder of Rasch analyses kept these two factors distinct.

item engagement score distributions can be compared directly. This comparison highlights the capacity of the questionnaire items to measure and to differentiate the children's engagement levels. More specifically, it establishes the range of engagement scores reported for children, and thus the likelihood that each item will be rated highly at different points within this range of scores.

For example, the RAPS may contain many items on which teachers endorse the highest response categories for most 5-year-olds. These items are thus extremely 'easy' for the teachers to endorse, and 5-year-olds would score highly overall. Alternatively, the RAPS-R may contain many items on which teachers endorse the lowest response categories for most 5-year-olds. These items are thus extremely 'difficult' for the teachers to endorse, and 5-year-olds would score low overall. In neither of these cases would the RAPS adequately target the engagement levels of 5-year-olds. This is analogous to administering a year 3 reading test to year 6 students (an easy test, on which most of the children would score high) or administering a year 3 reading test to year 1 students (a difficult test, on which most of the children would score low). These tests are not appropriate in measuring the reading levels of the intended cohort, and would not sufficiently distinguish between the reading levels of the children. Thus, for the RAPS to be developmentally appropriate for 5-year-olds, it should be sensitive in measuring engagement levels across the whole engagement continuum, including at the upper and lower ends. This study makes use of these clear strengths of Rasch analysis to examine the modified RAPS.

The sample and item distributions should show considerable overlap if the scale items are well-matched to the sample's engagement levels. Additionally, there should be enough items located along the engagement continuum to estimate each child's engagement level with reasonable precision (and little error).

The mean engagement levels for both the sample and the scale (consisting of all the items) can also be compared. The scale's mean engagement level (or 'item difficulty value') is set at zero by default. Thus, if the sample's mean engagement level (or 'person location value') were positive, it would be located at a higher engagement level than the

Table 5.7
Rasch Statistics for the 12-Item Cognitive-Behavioural Engagement Factor (n = 547)

Item	Location	SE	Response thresholds (logits) 2	3	4	5	Infit MS
Factor 1: Cognitive-behavioural engagement (12 items)							
3. More than required	1.02	0.23	-2.13	0.09	2.28	3.85	0.80
4. Loses/misplaces belongings	-0.12	0.24	-2.34	-1.37	0.49	2.75	**1.59**
6. Listens carefully	-0.66	0.31	-3.44	-1.96	0.22	2.53	0.86
7. Does just enough to get by	0.49	0.25	-2.72	-0.60	1.55	3.71	1.08
9. Sticks with difficult tasks	0.33	0.26	-2.94	-0.89	1.30	3.86	**0.61**
10. Does the best that can	-1.02	0.41	-4.00	-2.73	-0.18	2.83	0.76
13. Enthusiastic	-1.26	0.48	-5.56	-2.33	0.09	2.75	0.94
14. Bored	-1.28	0.43	-3.81	-3.05	-0.46	2.22	1.24
20. Depends on me	0.66	0.26	-2.63	-0.38	1.68	3.98	1.16
21. Prefers easy activities	1.93	0.25	-1.94	0.66	3.30	5.69	1.12
23. Likes to figure out for oneself	0.44	0.30	-3.50	-0.89	1.57	4.56	1.03
24. Copes positively when doesn't do well	-0.53	0.38	-4.94	-1.60	0.69	3.74	0.87

Note. MS = mean square; SE = standard error. All negatively-worded engagement items were reversed prior to analyses. Misfitting items in bold type.

Table 5.8

Rasch Statistics for the 11-Item Cognitive-Behavioural Engagement Factor, after Removing Item 4 (n = 547)

Item	Location	SE	Response thresholds (logits) 2	3	4	5	Infit MS
Factor 1: Cognitive-behavioural engagement (11 items)							
3. More than required	1.07	0.24	-2.31	0.10	2.42	4.07	0.83
6. Listens carefully	-0.73	0.31	-3.69	-2.14	0.22	2.71	0.95
7. Does just enough to get by	0.50	0.26	-2.94	-0.67	1.66	3.94	1.14
9. Sticks with difficult tasks	0.32	0.28	-3.16	-0.98	1.37	4.06	**0.65**
10. Does the best that can	-1.10	0.42	-4.28	-2.96	-0.18	3.02	0.80
13. Enthusiastic	-1.32	0.48	-5.78	-2.50	0.13	2.89	0.96
14. Bored	-1.38	0.44	-4.09	-3.29	-0.49	2.36	1.29
20. Depends on me	0.70	0.25	-2.81	-0.41	1.79	4.22	1.23
21. Prefers easy activities	2.02	0.26	-2.06	0.69	3.49	5.96	1.17
23. Likes to figure out for oneself	0.44	0.30	-3.75	-0.95	1.67	4.79	1.06
24. Copes positively	-0.56	0.39	-5.19	-1.74	0.74	3.97	0.93

Note. MS = mean square; SE = standard error. All negatively-worded engagement items were reversed prior to analyses. Misfitting items in bold type.

scale mean. Conversely, a negative mean person location value would suggest the opposite. The closer the mean person location is to 0, the better-matched the scale items are to the children's engagement levels.

5.3.3.1 Factor 1 – cognitive-behavioural engagement.

The individual item MS fit statistics for the 12-item cognitive-behavioural factor showed a good fit to the Rasch model, with two exceptions (see Table 5.7). Firstly, 'loses belongings' demonstrated misfit to the Rasch model, with an infit MS value of 1.59. This item may be a poor measure of 'organisation', or perhaps is not strongly related to the latent construct of engagement. Its poor performance was consistent with its low communalities throughout EFA iterations. This item warranted further examination before future use, and so was removed. Secondly, 'sticks with difficult tasks' showed overfit to the model, with an infit MS value of 0.61. This item was therefore relatively more discriminating than other items. Since persistence is an important facet of the engagement construct, and overfit is generally less problematic than misfit (Wilson, 2005), the item was retained to avoid compromising construct validity. The cognitive-behavioural items were re-analysed after removal of 'loses belongings' (Table 5.8). Individual item infit mean square values now ranged from 0.65 to 1.29.

The person-item map for the cognitive-behavioural engagement factor is displayed in Figure 5.3. The continuum of the engagement construct is displayed on a logit scale, with higher scores indicating higher levels of engagement. Children's engagement estimates are represented by 'X' on the left, and RAPS-R item response threshold estimates are represented by '*a.b'* on the right (also see numbers in Table 5.8), where '*a'* denotes item number, and *'b'* denotes threshold step. As the engagement scale has five response categories (from *never* to *always*), four response thresholds (numbered from 2 to 5) mark the boundaries between these response categories. Response thresholds are located at the engagement score where there is a 50% probability of endorsing one response category over a lower one. For example, threshold step 2 for Item 13 (or 13.2) is located at -5.78 logits on the map. Thus, a child with an engagement level of -5.78 logits

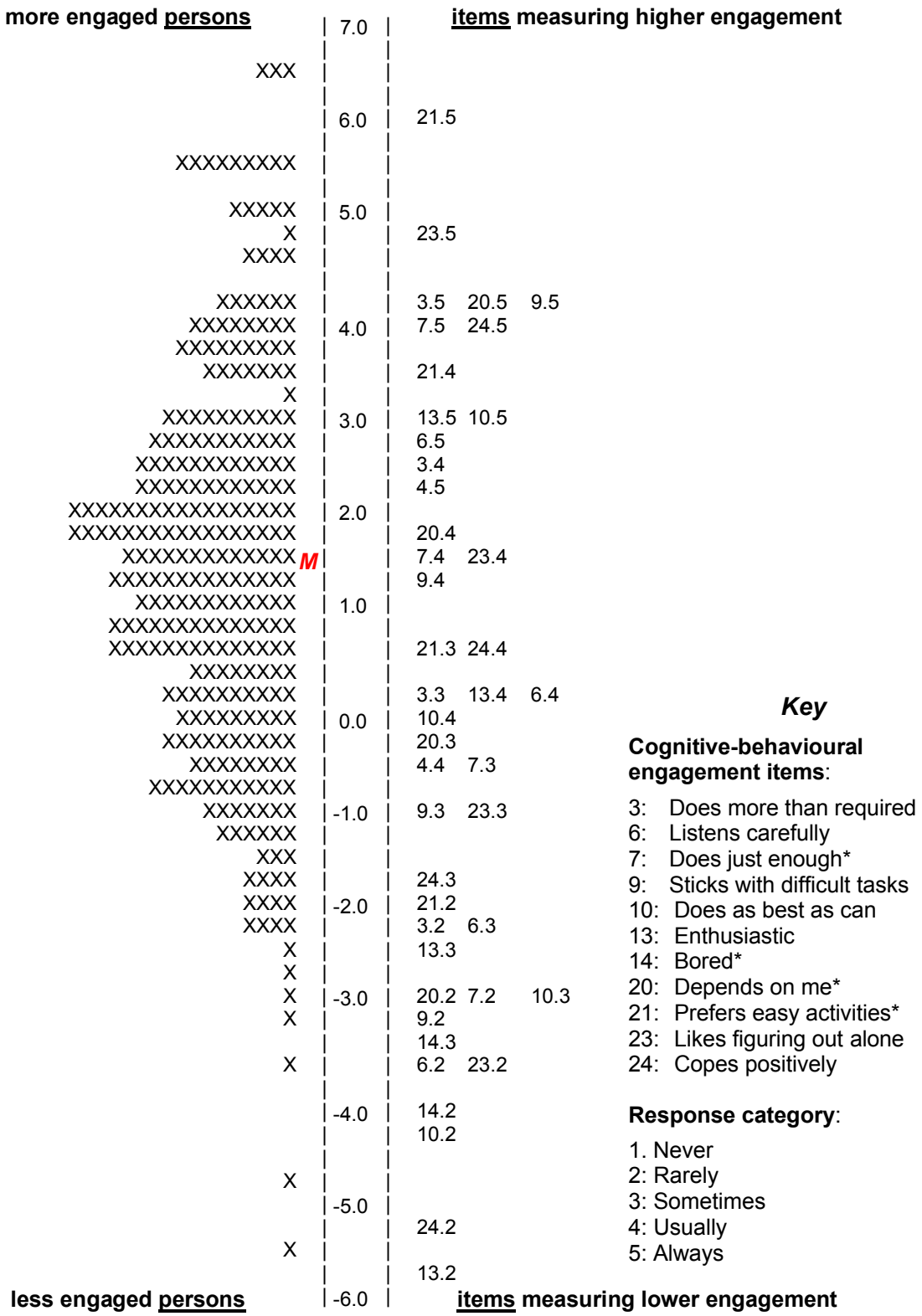


Figure 5.3. Person-item map for the 11-item cognitive-behavioural engagement factor. Children are represented by X, on the left. Each X represents two children. Threshold transitions for each item are on the right. Numbers are in the format *a.b*, with *a* denoting item number, and *b* denoting threshold step. For example, Item threshold step 13.2 represents the engagement level required to have a rating of 2 (*rarely*) or better rather than 1 (*never*) for 'enthusiastic'. The interval scale is in logits (log odds units). *M* = person mean, where the item mean has a default of 0. * Data for negatively worded items reversed in analyses.

has a 50% probability of receiving a category rating of 2 (*rarely*) over 1 (*never*) for the item 'appears enthusiastic'. Any child with an engagement level greater than -5.78 logits would have a greater than 50% chance of receiving a *rarely* rating. However, a child would then need an engagement level of at least -2.50 logits to be more likely to receive the next highest rating (*sometimes*) on this item.

The easiest steps for the teachers to endorse were step 2 on items 13 and 24. Thus, children with the lowest cognitive-behavioural engagement levels in the sample were likely to be considered to *never* show enthusiasm or positive coping with failure. Conversely, the hardest steps to endorse were step 5 on items 23 and 21 (note: this item was reversed for analyses). Thus, children with the highest cognitive-behavioural engagement levels in the sample were likely to be considered to *always* like figuring things out alone and *never* prefer easy activities. Engagement estimates for both the children and the item thresholds were well-spread out, both ranging from about -5.5 logits to about +6.5 logits. This suggested that both the children and the items showed a wide range of engagement levels.

On average, the scale was too easy for the current sample: the item mean difficulty (set at 0) was lower than the mean engagement level of the sample (*M* at 1.46 logits, *SD* = 1.97). Ideally, this correspondence would be higher. In other words, the scale adequately assessed low to moderately high cognitive-behavioural engagement levels (threshold estimates ranged from -5.78 to 5.96 logits), while the sample was mostly characterised by moderate to high cognitive and behavioural engagement levels (ranging from -5.46 to 6.48 logits). However, generally items were spread well across the person distribution, with little 'gapping'. Most gaps were small, excepting a couple at the highest levels of the scale. The cognitive-behavioural engagement levels of 12 children (who are not shown on the person-item map) were too high to be measured by the items – they received perfect scores. To estimate scores for those who had 'topped out', extrapolation using the highest person ability estimate (6.48) and its standard error (1.08) was conducted, producing an approximate score of 7.56 logits. It is important to note that this perfect score is only an approximation, and not necessarily accurate. It is simply marginally higher than the highest score on the scale. It may therefore underestimate many of these children's true scores.

Table 5.9
Rasch Statistics for the 5-Item Emotional Engagement Factor (n = 547)

Item	Location	SE	Response thresholds (logits)				Infit MS
			2	3	4	5	
Factor 2: Emotional engagement (5 items)							
12. Frustrated	-0.07	0.45	-3.19	-1.79	0.81	3.90	1.16
15. Happy	0.72	0.29	-	-1.69	0.00	3.84	0.95
16. Angry	-0.72	0.45	-2.69	-1.87	-0.10	1.80	1.04
17. Worried	0.33	0.38	-3.00	-1.15	1.39	4.07	0.94
18. Sad	-0.26	0.44	-3.19	-1.77	0.60	3.32	0.88

Note. MS = mean square; SE = standard error. All negatively-worded engagement items were reversed prior to analyses.

5.3.3.2 Factor 2 - emotional engagement.

Fit statistics for the 5-item emotional factor indicated a good fit to the Rasch model, with all infit mean square values lying between 0.88 and 1.16 (see Table 5.9). The person-item map for the emotional engagement factor is displayed in Figure 5.4. The easiest steps for the teachers to endorse were step 2 on Items 12 and 18. Thus, children who were considered to *always* appear frustrated and sad were likely to have the lowest emotional engagement levels in the sample. Conversely, the hardest step for the teachers to endorse was step 5 on Item 17. Thus, children who were considered to *never* appear worried were likely to have the highest emotional engagement levels in the sample. The range of engagement levels measured on the emotional scale was slightly smaller than that seen for the cognitive-behavioural factor. The item threshold estimates ranged from -3.19 to 4.07, and the sample's emotional engagement levels ranged from -3.38 to 4.95.

Some concerning performance aspects were highlighted within the map (Figure 5.4). The mean emotional engagement level of the sample was 2.18 logits (*SD* = 1.70) above the item difficulty mean (set at 0). This was reflected in the skewed score distribution, showing that many of the children were rated highly on the items. In other words, this scale was extremely easy for the current sample. The scale adequately assessed low to moderate emotional engagement levels, whereas the sample was characterised by moderate to very high emotional engagement levels. Furthermore, 59 children (who are not shown on the person-item map) received perfect scores, indicating their emotional

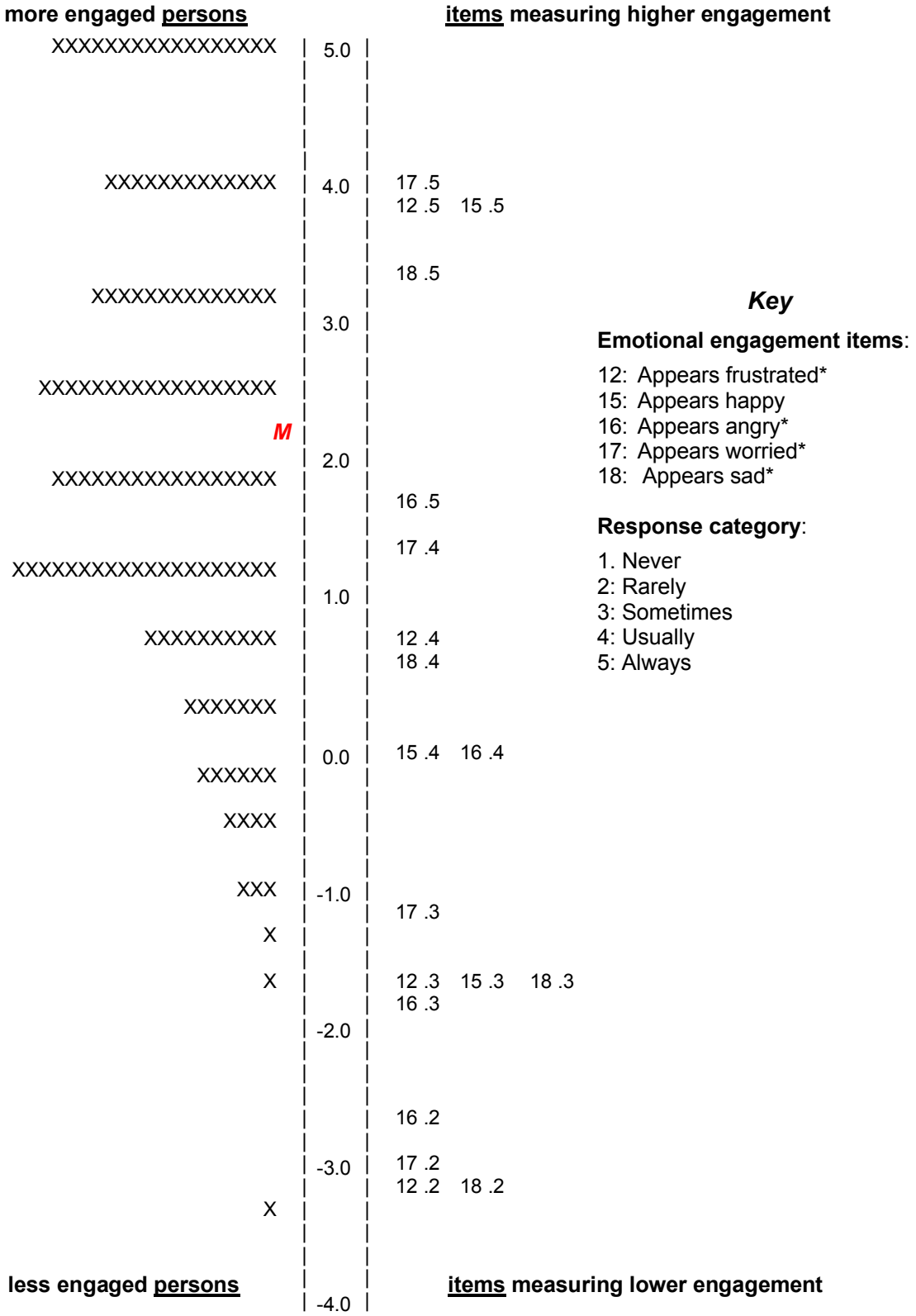


Figure 5.4. Person-item map for the 5-item emotional engagement factor. Children are represented by X, on the left. Each X represents four children. Threshold transitions for each item are on the right. Numbers are in the format *a.b*, with *a* denoting item number, and *b* denoting the threshold step. For example, Item threshold step 18.2 represents the engagement level required to have a rating of 2 (rarely) or better rather than 1 (never) for the item 'sad'. The interval scale is in logits (log odds units). *M* = person mean, where the item mean has a default of 0. * Data for negatively worded items reversed in analyses.

engagement was too high to be measured by these five items. A perfect score estimate of 6.08 logits was obtained for these children by extrapolation. Thus, this scale may be useful for other samples that are rated as less emotionally engaged, but it could not adequately measure the emotional engagement of the young children constituting this sample, nor discriminate between them.

5.3.4 Reliability

5.3.4.1 Internal consistency.

Firstly, Cronbach's alpha for the initial scale (comprising all 24 items) was calculated. This value was then compared to those of the two (cognitive-behavioural and emotional) final engagement sub-scales, to assess whether the increase in structural validity had occurred to the detriment of internal consistency. The reason why this might occur is because internal consistency is a function of both the number of scale items, and the average item intercorrelation. Thus, eliminating items, including those that are highly redundant, would likely result in a decrease in internal consistency. Decreasing redundancy is desirable, but this can be problematic where reliability then drops below an acceptable level. Given the that a compromise is required between optimal internal validity and reliability, Nunnally and Bernstein (1994) recommended an internal consistency benchmark of .80 for use in basic research, with no need to strive for any increase (L. A. Clark & Watson, 1995).

The coefficient alpha for the initial 24 items was very high at .96, indicating any subsequent drop in reliability would not be detrimental. Indeed, the extraordinarily large coefficient may have indicated some degree of multicollinearity and redundancy. After removing several items, and splitting the remaining items across two factors, the internal consistency of both sub-scales was still reasonably high: the 11-item cognitive-behavioural engagement sub-scale had a Cronbach's alpha of .94 and the 5-item emotional engagement sub-scale had a lower alpha of .84. Both were considered acceptable for use in basic research (Nunnally & Bernstein, 1994).

5.3.4.2 Person and item separation.

Reliability indices for both persons (person separation index, or PSI) and items (item separation index, or ISI) were examined. These separation indices are analogous in interpretation to Cronbach's alpha, with possible values ranging from 0 (not reliable) to 1 (completely reliable). For these indices, reliability is related to the degree of spread between the engagement scores. Higher *person* separation values indicate that children's engagement scores show a good degree of spread and differentiation, and thus there is a greater likelihood of reproducing their scores with a new set of items. Conversely, higher *item* separation values indicate that the engagement scores assigned to each item show good spread and differentiation, and that there is a greater likelihood of reproducing the item engagement scores with a new sample of children.

The 11-item cognitive-behavioural factor showed high person and item separation indices of .93 and .90, respectively. These high values indicated that the scale could reliably discriminate between children with different levels of engagement. Also, the questionnaire items could be distinguished from one another in terms of their engagement scores.

For the 5-item emotional engagement factor, the person separation index was .76 which, although acceptable, is not high. This indicates that children could be better spread out across the emotional engagement continuum, and suggests the items were generally not sufficiently discriminating. This sub-optimal discrimination was especially pronounced among the children with very high levels of engagement, as 59 children (10% of the sample) received perfect scores on the items. The item separation index was unacceptably low, at .45. The fact that many children were rated highly on all of these items showed that these items measured very similar and relatively low engagement levels, which were not sufficiently distinguishable from one another. In other words, the items cannot be considered reliable at measuring different levels of engagement, as seen among the 5-year-old children.

It can be seen that Rasch person separation index produced lower reliability estimates for the emotional engagement subscale than did the Cronbach's alpha calculations. This is because the calculation of Rasch person separation indices does not

Table 5.10
Properties of the Final Cognitive-Behavioural and Emotional Engagement Subscales

	Cognitive-behavioural engagement (n = 572)		Emotional engagement (n = 574)	
	Likert	Rasch	Likert	Rasch
Possible range	11 - 55	13.95 - 55.68	5 - 25	5.7 - 26.16
Actual range	13 - 55	16.62 - 55.68	8 - 25	7.24 - 26.16
Mean (*SD*)	39.41 (7.96)	37.77 (6.39)	20.64 (3.04)	19.17 (4.00)
Skewness (SE)	-0.17 (0.10)	0.36 (0.10)	-0.60 (0.10)	0.10 (0.10)
Kurtosis (SE)	-0.31 (0.20)	0.46 (0.20)	0.43 (0.20)	-0.61 (0.20)
K-S	.04**	.06***	.09***	.11***

Note. SE = standard error; K-S = Kolmogorov-Smirnov test of normality.
**p < .01. ***p < .001.

include the children who receive perfect scores, whereas the calculations of Cronbach's alpha indices include the full sample.

5.3.5 Final Scale Properties

Properties of the final 11-item cognitive-behavioural subscale and the 5-item emotional engagement subscale are shown in Table 5.10. Scale properties when using Likert scaling (i.e., all items summed, with item responses scored from 1 to 5) are shown for illustration purposes. However, logit scores from Rasch analyses were used for all analyses herein as, unlike Likert scores, they represent interval-level measurement. Rasch logit scores for both scales were linearly transformed by adding and multiplying by constants. This was done so that the transformed score range would approximate the range seen in Likert scaling, thus making the interpretation of total scores easier. Higher scores on bothsubscales indicated higher levels of (cognitive-behavioural and emotional) engagement. Of the 575 children in the sample, 3 did not receive a final cognitive-behavioural engagement score, and 1 child did not receive a final emotional engagement score, as they had data for less than 80% of the scale items. Though normality statistics suggested that each scale showed mild skewness and kurtosis, this was not obvious from a visual inspection of distributions.

Table 5.11
Correlations between Cognitive-Behavioural and Emotional Engagement and Theoretically Related Variables

Variable	Cognitive-behavioural engagement *r*	Emotional engagement *r*
Reception (*n* = 575)		
School avoidance (p)	-.18***	-.21***
School avoidance (t)	-.34***	-.38***
Reception sub-sample (*n* = 98)		
Engagement (o)	.02	-.18
Emotional engagement (c)	.10	.10
Engagement during interview (o)	.15	.14
Year 1 (*n* = 551)		
School progress (t)	.45***	.30***
Frequency of disciplinary action (t)	-.36***	-.23***
School absence/lateness (unexplained) (t)	-.19***	-.11**
Classroom absence (t)	-.27***	-.15***

Note. (p) = parent reported variable; (t) = teacher-reported variable; (o) observed variable; (c) = child-reported variable.
** $p < .01$. *** $p < .001$.

5.3.6 Associations with Other Variables

The final cognitive-behavioural and emotional engagement subscales (with 11 and 5 items, respectively) were then subject to external validity tests, by relating scores on these scales with scores on other variables that were relevant to engagement theory.

5.3.6.1 Convergent validity (cross-sectional).

Convergent validity correlations were calculated for the 97 children who were a part of the reception sub-sample (see Table 5.11). There was a non-significant small positive association between child-reported emotional engagement and (1) teacher-reported cognitive-behavioural engagement and (2) teacher-reported emotional engagement. There was a negligible near-zero correlation between teacher-reported cognitive-behavioural engagement and observed engagement. However, there was a small (though non-significant) negative correlation between teacher-reported emotional engagement and observed engagement. Though non-significant, there were small positive correlations

between children's engagement levels during the child interview, as rated by the interviewer, and teacher-reported (1) cognitive-behavioural and (2) emotional engagement.

5.3.6.2 Discriminant validity.

Girls (M = 39.01, SD = 6.01) showed significantly higher levels of cognitive-behavioural engagement than boys (M = 36.51, SD = 6.53), t (570) = -4.76, $p < .001$. This difference was of a moderate effect size, d = 0.40 (Cohen, 1988). Additionally, girls (M = 19.52, SD = 3.78) also showed significantly higher levels of emotional engagement than boys (M = 18.81, SD = 4.19), t (570) = -2.14, $p < .05$. This difference was of a small effect size, d = 0.18 (Cohen, 1988).

Children who were not in receipt of a school card in reception had a significantly higher mean cognitive-behavioural engagement level (M = 38.75, SD = 6.28) than did the children who had school cards (M = 36.80, SD = 6.21), t (485) = 2.84, $p < .01$. This difference was of a small effect size, d = 0.31 (Cohen, 1988). Additionally, children without school cards (M = 19.70, SD = 3.91) also had a significantly higher mean emotional engagement level than did the children with school cards (M = 18.69, SD = 4.18), t (486) = 2.31, $p < .05$. This difference was of a small effect size, d = 0.25 (Cohen, 1988).

5.3.6.3 Criterion validity.

The following analyses assess the validity of the two engagement scales by examining their associations with other variables, according to predictions within engagement theory (Connell, 1990; Connell & Wellborn, 1991; Finn, 1989; Fredricks et al., 2004). Scores on the teacher-reported cognitive-behavioural and emotional engagement scales were correlated with scores on several related variables, which were measured (1) at the same time as the engagement questionnaire (in reception), and (2) one year after the engagement questionnaire, during year 1 at school.

5.3.6.3.1 Correlations with reception data (cross-sectional).

Cognitive-behavioural engagement was significantly negatively related to both parent-reported and teacher-reported school avoidance behaviours witnessed at home and school, respectively (Table 5.11). Similarly, emotional engagement was significantly negatively related to both parent-reported and teacher-reported school avoidance (Table 5.11). These correlations were small to moderately-sized (Cohen, 1988).

5.3.6.3.2 Correlations with year 1 data (longitudinal).

A significant positive correlation was seen between teacher-reported school progress in year 1, and (1) cognitive-behavioural and (2) emotional engagement in reception (Table 5.11). Significant small-moderate negative correlations were observed between the frequency of disciplinary action in Year 1 and (1) cognitive-behavioural and (2) emotional engagement in reception (Table 5.11). Additionally, there were significant small negative correlations between Year 1 unexplained school absence/lateness and (1) cognitive-behavioural and (2) emotional engagement in reception (Table 5.11). Finally, there were significant small negative correlations between classroom absence and (1) cognitive behavioural and (2) emotional engagement in reception (Table 5.11).

5.4 Summary

This chapter reports the psychometric properties of the modified RAPS engagement scale when used to rate children in their first school year. The final two-factor scale assessed cognitive-behavioural engagement (11 items), and emotional engagement (5 items). These factors showed moderate to high factor loadings, and were moderately correlated. While the cognitive-behavioural subscale could distinguish between the cognitive-behavioural engagement levels of children (seen in the high person and item separability), the emotional subscale could not reliably measure children's emotional engagement. Thus, while both scales demonstrated acceptable construct validity, only the cognitive-behavioural subscale met current reliability standards for applied research. As the emotional engagement subscale needs further adaptation prior to continued use, it was not considered reliable enough to function as an outcome variable within this thesis, and was not used further beyond this chapter.

Using Rasch modelling to examine the psychometric properties of the items in the scales allowed child engagement to be profiled against the items, through examination of the person-item map; children with low levels of cognitive-behavioural engagement showed higher levels of apathy towards classroom learning, and rarely did their best or coped well with failure. Conversely, children with high levels of cognitive-behavioural engagement showed greater preference for challenges, independent work styles, and a tendency to go beyond what was required. Children with low levels of emotional engagement showed high levels of frustration, anger and sadness, and highly emotionally engaged children were generally happy and worry-free.

Central to this investigation was whether scale items, used previously with older children, would be developmentally appropriate for the current sample of 5-year-olds. For the cognitive-behavioural engagement subscale, Rasch analysis revealed that RAPS-R items could measure these children's cognitive-behavioural engagement levels reasonably well. As it was generally less likely for teachers to endorse an *always* rating for the cognitive items than the behavioural items, many children rated as high on the cognitive-behavioural engagement subscale still did not receive high ratings on the cognitive items. This is consistent with Finn's (1989) theory that cognitive engagement develops after behavioural engagement, as children mature. Perhaps the foundations for such higher-level cognitive engagement are present only in young children who are highly behaviourally engaged. As engagement is supposedly at its peak in the early years (e.g., Eccles et al., 1984; Fredricks et al., 2003; Marks, 2000; McDermott, 1999; Tucker et al., 2002; Wigfield et al., 2006), then younger children may well have high cognitive engagement, but perhaps the particular strategies they use (e.g., meta-cognition) are undeveloped. However, an alternative possibility that cannot be discounted is that at this age, children's cognitive and behavioural engagement may be in the process of becoming more differentiated (in the way that children's self-concept does). Regardless of the specific developmental mechanisms at play, it appears that both cognitive and behavioural aspects of engagement can be applied to reception children (when using developmentally-appropriate items).

The low reliability of the emotional engagement subscale limited the development of a multidimensional engagement scale. Teachers tended to rate children very highly on the emotional engagement items, so total scores could not distinguish between approximately 10 percent of children who received the highest possible scores on this scale. This is concerning, as to determine the limits of each child's engagement, there need to be items on which children do not receive the highest rating. Otherwise, it is impossible to determine if a child's final score reflects his/her true level of engagement, or simply the highest level that can be measured using the scale. This becomes especially problematic when attempting to document positive change within intervention programs: if children are already receiving the highest scale score possible, then they cannot be rated as having improved, even though their actual engagement within the classroom may increase. This would ultimately undermine the perceived merit of such programs.

Nonetheless, emotional engagement scores were able to predict important school outcomes, consistent with engagement theory and previous research (see Connell, 1990; Connell et al., 1995; Connell et al., 1994; Connell & Wellborn, 1991; Finn, 1989; Fredricks et al., 2004; Furrer & Skinner, 2003; Obradović et al., 2010). It seems this scale has some predictive value, but further research and development is needed to develop a well-discriminating scale. Whether the high ratings seen here are inherent in the emotional items, or a function of the age of the current sample, is unclear. These problems only emerge clearly within Rasch analyses, which have previously not been used to evaluate emotional items within the RAPS, or other engagement scales.

The two factor scale structure found, representing cognitive-behavioural and emotional engagement, supports treating emotional and behavioural dimensions as conceptually distinct (see Finn, 1989; Fredricks et al., 2004). Analyses suggested that these two dimensions appear to be distinct at this young age. Wellborn (1991) found three distinct behavioural, cognitive, and emotional factors, though items also loaded on a higher-order unidimensional scale. Though a very similar three-factor structure was entirely plausible in the current sample, there was great overlap between cognitive and behavioural factors. The engagement scale showed better psychometric properties when

these two factors were allowed to unite. Cognitive and behavioural items may load together in samples of young children; it seems sensible that during their first school year, children's cognitive and behavioural engagement may not yet be fully differentiated, as meta-cognitive skills may be somewhat undeveloped. Also, perhaps several cognitive items may have been interpreted by teachers through children's behaviour.

Additionally, factor analysis results suggested that the 'interest' related items (i.e., 'interested', 'bored' and 'enthusiastic') were more closely linked with behaviour than emotion. Though researchers generally analyse these items as part of the RAPS emotional engagement subscale, both Connell and Wellborn initially considered such 'interest' items to assess more behavioural than emotional engagement (Connell, 1990; Connell & Wellborn, 1991). These results also closely paralleled those of Zimmer-Gembeck and colleagues (2006), who found that 'bored' loaded with indicators of behavioural disengagement within exploratory factor analyses.

The low correlations between teacher-reported and child-reported engagement are likely due to a cross-informant effect. Low (though significant) correspondence between teacher and child reports of children's emotional engagement at around the .20 level has been reported previously (Decker et al., 2007; Fredricks et al., 2003; Furrer & Skinner, 2003; Murray, Murray et al., 2008; Skinner & Belmont, 1993). Furthermore, these studies mostly involved children in third to sixth grade, who may have had a better ability to convey their emotions using an established scale. Such developmental differences may explain the slightly lower correlation seen here.

However, the non-significant correlation between observed and teacher-reported engagement was unexpected (Skinner et al., 2009). Perhaps the teacher report tapped *sustained* engagement, which could not be observed during 2-minute 'snapshots'. Unfortunately, more and/or longer observations were not within the scope of this study. Additionally, children within the sub-sample had significantly higher teacher-reported engagement than the total sample. Perhaps the limited range of engagement scores masked what may have otherwise been larger positive associations.

Children's engagement was related to their subsequent school progress, consistent with theory (Connell, 1990; Connell & Wellborn, 1991; Finn, 1989; Fredricks et al., 2004) and with other studies in the early school years (Claessens et al., 2009; Finn & Pannozzo, 2004; Ladd et al., 2000; McClelland et al., 2006; Valiente et al., 2008; Walker & Berthelsen, 2009b). This finding illustrates the importance of early engagement for establishing positive schooling trajectories. Engagement in the very first year of school may be a key target for change and growth, to improve children's school performance before standardised testing begins, and academic trajectories more or less stabilise. If intervention programs foster reinforcing cycles of engagement, mastery and success, children's ability to work hard and persist at school in order to succeed may become more of a conditioned response, and as something enjoyable and valued.

Boys and children from lower socio-economic backgrounds began school with lower engagement, consistent with previous research (Berthelsen & Walker, 2009; Childs & McKay, 2001; J. N. Hughes et al., 2006; Ladd et al., 1999; Marks, 2000; Tach & Farkas, 2006). These children have the most to gain from intervention programs that work to promote engagement in the early years. Additionally, engagement has previously shown similar moderate negative correlations with teacher-reported school avoidance behaviours, and absences and disciplinary action in samples of young children, some of which included children in their first school year (Buhs et al., 2006; Decker et al., 2007; Valiente et al., 2008). In Finn's (1989) theoretical model, these behaviours signalled the start of a gradual disengagement process, culminating in truancy, suspension, and sometimes school dropout. Redirecting children's early engagement levels may hold the key in stemming this process of school failure.

Overall, this chapter has shown the cognitive-behavioural engagement subscale is suitable for use among young children. This subscale will now be referred to as the RAPS-R for the remainder of this thesis. The following chapters will continue research with the RAPS-R by examining possible predictors and mechanisms of cognitive-behavioural classroom engagement during children's first school year.

6

MENTAL HEALTH PROBLEMS AND CLASSROOM ENGAGEMENT: LONGITUDINAL TRAJECTORIES AND GENDER DIFFERENCES

6.1 Introduction

The purpose of this chapter was to examine the association between children's preschool mental health problems and their subsequent classroom engagement in reception, and to identify any gender differences in this association. Both variable-centred analyses (i.e., regression modelling) and person-centred analyses (i.e., cluster analyses) were conducted to provide complimentary information. Variable-centred analyses examined whether the association between mental health problems and engagement variables differed as a function of gender. In contrast, person-centred analyses identified distinct sub-groups of children that showed different patterns of mental health problems and engagement. Children's mental health problems were examined using their 'total difficulties' composite score, and their four constituent subscale scores.

6.1.1 Hypotheses.

As there is little existing research in this area, the analyses in this chapter took an exploratory approach. However, some tentative hypotheses were proposed:

Variable-centred regression analyses:

- Boys would have significantly higher levels of hyperactivity/inattention and conduct problems than girls.
- Boys would have significantly lower classroom engagement levels than girls.
- There would be no significant differences in the levels of emotional symptoms experienced by boys and girls.
- Any identified gender differences in classroom engagement would be significantly reduced after adjusting for levels of mental health problems.

- Gender would moderate the association between mental health problems and classroom engagement. Specifically:
  - Externalising mental health problems would show stronger associations with engagement for boys than for girls.
  - Additionally, given the mixed findings regarding gender differences in associations between internalising mental health problems and developmental outcomes (e.g., Doctoroff et al., 2006; Willcutt & Pennington, 2000b), emotional symptoms would either show (1) similar associations with engagement for both genders, or if gender was found to significantly moderate this association, then it would show (2) stronger associations with engagement for girls than for boys.

Person-centred cluster analyses:

- Several meaningful clusters of children would emerge, displaying distinct patterns and trajectories of adaptation with respect to mental health problems and engagement. Specifically:
  - A large well-functioning group, a small 'pervasive problems' group, and other small groups with lower-level and more specific problems were anticipated.
- Predominantly 'externalising' clusters were hypothesised to contain a greater proportion of boys.

6.2 Preliminary Analyses

The results from preliminary analyses conducted to assess preconditions of regression and cluster analyses are reported in Appendix D. In sum, these results showed that assumptions were largely met, suggesting that it was reasonable to proceed with the statistical analyses presented here.

6.3 Statistical Analyses

Several variable-centred analyses were used to address questions regarding associations between variables. The strength of all associations was examined for parent- and teacher-reported mental health problems separately. Gender differences in mental health problems and engagement scores were examined using independent samples *t*-tests

and effect size estimates (Cohen's *d*) for mean scores. In addition to mental health problems scale scores, the SDQ also provides a clinical screening classification into normal, borderline and abnormal bandings.[18] Thus, gender differences in the proportion of children with mental health problems scores in the 'abnormal' range were examined using chi-square tests for independence.

Next, the supposition that gender differences in engagement may be explained by existing gender differences in mental health problems was examined using hierarchical[19] multiple linear regression.

Hierarchical multiple regression was also used to examine whether gender moderated the association between mental health problems and engagement. For the moderated regressions, all continuous independent variables were centred prior to computing interaction terms, to avoid the non-essential multicollinearity that arises when correlating main effects variables and their interaction term (Aiken & West, 1991).

In all regressions, three covariates that were significantly related to engagement (number of terms at school, Aboriginal/Torres Strait Islander origin, and school type in reception (public/private)) were adjusted for in the first step. There was a small positive correlation between the number of terms at school, and teacher-reported engagement, r (572) = .14, $p < .01$. The exact nature of the engagement differences between Indigenous and school type groups (both $p < .01$) cannot be reported here due to confidentiality obligations.

In contrast, person-centred cluster analyses were used to examine patterns within children. Profiles of children were identified based on their levels of mental health problems and classroom engagement using two-step cluster analysis. As person-centred analyses are designed to examine the whole child simultaneously, both parent and teacher-reported mental health problems were included in the same analysis. This also addressed the domain specificity (i.e., home versus preschool) versus globality of any problems

[18] Cut-points were developed by Goodman (Goodman, 2001, 2010), based on scores found within a normative sample. The abnormal banding corresponds the most extreme 10% of a normative sample, with a further 10% scoring in the borderline range.

[19] The term 'hierarchical' is used in this thesis to indicate a sequence of models with increasing numbers of predictor variables. It does not imply a hierarchy of error structures such as those implied by the term 'multilevel modelling'.

reported. Similarities between clusters were calculated using log likelihood distances, and both the Schwarz Bayesian Information Criterion (BIC) and the log-likelihood distance were examined in selecting the most appropriate cluster solution. All variables were standardised prior to clustering. Resulting profiles were then examined for gender differences and differences on several school outcomes using chi-square tests for independence, and MANOVA, respectively. Post-hoc tests for MANOVAs used Holm's step-down procedure (Holm, 1979) to adjust for the number of tests conducted, thereby reducing the probability of a Type I error. When the assumption of homogeneity of variances was violated, the non-parametric Mann-Whitney Test was used to analyse group differences for those dependent variables.

6.4 Results

6.4.1 Gender Differences in Levels of Mental Health Problems and Classroom Engagement

A series of independent samples *t*-tests were conducted to identify any statistically significant gender differences in mean levels of mental health problems (specific and total) in preschool, and classroom engagement in reception. These results are presented in Table 6.1.

There were several statistically significant gender differences in children's preschool mental health problems, which were quite consistent across parent and teacher reports. Where gender differences existed, boys always experienced the higher level of problems, and this difference was more pronounced among teacher reports. Boys showed higher levels of total problems than girls in both parent and teacher reports, which was a small effect size (as suggested by Cohen, 1988). For the subscales, boys showed higher levels of hyperactivity and conduct problems than girls. These differences were of a small effect size (Cohen, 1988), except for teacher-reported hyperactivity, which showed a medium effect size. Although boys had slightly higher levels of peer problems than girls, this only reached significance for teacher reports, and this effect size was small (Cohen, 1988). There were no appreciable gender differences in levels of emotional symptoms.

Table 6.1
Gender Differences in Mental Health Problems and Classroom Engagement

Variable	Total (n = 575)	Boys (n = 282)	Girls (n = 293)	Gender difference t	d
		Preschool			
Total problems (p)	8.59 (4.76)	9.14 (4.78)	8.07 (4.69)	2.71**	.23
Hyperactivity/ inattention (p)	3.66 (2.23)	4.05 (2.22)	3.29 (2.18)	4.14***	.35
Emotional symptoms (p)	1.77 (1.71)	1.70 (1.59)	1.84 (1.82)	-0.99	-.08
Conduct problems (p)	1.67 (1.51)	1.86 (1.55)	1.49 (1.44)	3.00**	.25
Peer problems (p)	1.49 (1.56)	1.52 (1.61)	1.45 (1.51)	0.60	.04
Total problems (t)	5.46 (5.18)	6.68 (5.93)	4.29 (4.02)	5.64***	.47
Hyperactivity/ inattention (t)	2.02 (2.51)	2.74 (2.80)	1.32 (1.95)	7.05***	.59
Emotional symptoms (t)	1.31 (1.87)	1.35 (1.93)	1.28 (1.81)	.47	.04
Conduct problems (t)	0.72 (1.39)	1.00 (1.66)	0.44 (0.99)	4.82***	.41
Peer problems (t)	1.41 (1.66)	1.58 (1.75)	1.24 (1.55)	2.46*	.21
		Reception			
Engagement (t)	37.77 (6.39)	36.51 (6.53)	39.01 (6.01)	-4.76***	-.40

Note. (p) = parent-reported variable; (t) = teacher-reported variable. d = Cohen's measure of effect size.
*p < .05. **p < .01. ***p < .001.

Additionally, boys showed significantly lower levels of classroom engagement in reception than did girls. This was of a small-medium effect size (Cohen, 1988).

6.4.2 Gender Differences regarding the Proportion of 'Abnormal' Mental Health Problems

The proportions of boys and girls with mental health problems scores falling within normal, borderline and abnormal bandings were compared statistically using chi-square tests for independence (see Table 6.2). Results were fairly consistent with those found using continuous scores, in that a greater proportion of boys consistently displayed problems in the abnormal range on all scales (except parent-reported emotional symptoms) compared with girls, and gender differences were always larger for teacher reports. However, these gender differences only reached significance for the externalising

Table 6.2

Proportions of Boys and Girls with Mental Health Problems Scores in the Normal/Abnormal Range

	Total sample (n = 575)			Boys (n = 282)			Girls (n = 293)			
Variable	Normal %	Borderline %	Abnormal %	Normal %	Borderline %	Abnormal %	Normal %	Borderline %	Abnormal %	$\chi^2(2)$
Total problems (p)	84.3	9.4	6.3	81.2	11.3	7.4	87.4	7.5	5.1	4.15
Hyperactivity/ inattention (p)	82.8	5.7	11.5	79.1	5.3	15.6_a	86.3	6.1	7.5_a	9.29**
Emotional symptoms (p)	84.7	6.6	8.7	86.5	6.7	6.7	82.9	6.5	10.6	2.67
Conduct problems (p)	73	16.3	10.6	67.7_a	19.5_b	12.8	78.2_a	13.3_b	8.5	7.94*
Peer problems (p)	76.9	13.9	9.2	76.6	12.8	10.6	77.1	15	7.8	1.74
Total problems (t)	86.4	7.1	6.4	78.7_a	10.6_b	10.6_c	93.9_a	3.8_b	2.4_c	28.55***
Hyperactivity/ inattention (t)	90.3	3.8	5.9	84.4_a	6.0_b	9.6_c	95.9_a	1.7_b	2.4_c	21.67***
Emotional symptoms (t)	93	2.1	4.9	92.2	2.1	5.7	93.9	2.0	4.1	0.78
Conduct problems (t)	88.3	5.4	6.3	82.3_a	7.8	9.9_b	94.2_a	3.1	2.7_b	20.17***
Peer problems (t)	86.6	8.2	5.2	85.5	7.4	7.1	87.7	8.9	3.4	4.17

Note. Within each row, the same subscript letters indicate which bandings of the mental health problems subscale show a disproportionate gender balance, using a z-test for two proportions. (p) = parent-reported variable; (t) = teacher-reported variable.

*$p < .05$. **$p < .01$. ***$p < .001$.

scales of hyperactivity and conduct problems: boys were more likely than girls to have hyperactivity and conduct problems scores in the abnormal range, for both parent and teacher reports. The pattern of the proportion of abnormal cases also differed by gender. Specifically, boys were more likely to experience abnormal-level externalising problems (ranked first and second) than internalising problems (ranked fourth), whereas girls were more likely to experience abnormal-level internalising (ranked first) than externalising problems (with hyperactivity consistently ranked fourth). As there were slightly less statistical differences for rates of abnormal problems than for mean levels, this would suggest that although boys generally have higher mean levels than girls, the two genders are more likely to fall within the same clinically-defined range. However, if boys do have abnormal level problems, they are more likely to be of the externalising type, whereas girls' abnormal problems were more likely to be emotional in nature.

6.4.3 Can Preschool Mental Health Problems Explain the Gender Difference in Engagement?

As boys did indeed have higher levels of mental health problems and lower levels of engagement, I next examined whether boys' engagement disadvantage was an artefact of their higher levels of mental health problems. A series of eight hierarchical regression analyses were conducted with reception classroom engagement as the dependent variable. These eight regressions varied by the specific mental health problem (i.e., hyperactivity, emotional symptoms, conduct problems, or peer problems), which also differed by reporter (i.e., parent or teacher). The mental health problems variables were entered into separate regressions rather than simultaneously to determine exactly which (if any) variable/s explained most of the gender difference in engagement. For each regression, gender was entered at Step 1, to examine the unadjusted gender gap in reception classroom engagement. Covariates were included at Step 2.[20] In the third and final Step, one of the eight mental health problems variables was added, and its effect on the gender-engagement association (i.e., the standardised regression coefficient) was examined.

[20] Steps 1 and 2 were identical for all eight regression models.

Gender coefficients in Steps 2 and 3 were then compared to determine whether the gender gap in engagement could be explained by preschool mental health problems. A decline in the coefficient size would indicate this was the case. Results of these regressions are presented in Tables 6.3 and 6.4 (for parent- and teacher-reported mental health problems, respectively).

Step 1 confirmed the small positive bivariate effect of gender on engagement: girls (coded as 1) showed significantly higher classroom engagement than boys (coded 0). After accounting for the four covariates in Step 2, the gender effect on engagement was relatively unaffected, with the regression coefficient only reducing by 5% (from .20 to .19).

It was the externalising mental health problems in preschool - but predominantly hyperactivity - that were most strongly associated with the engagement gender gap in reception. The gender coefficient in Step 2 (β =.19) was greatly reduced by the inclusion of parent- and teacher-reported hyperactivity and conduct problems in Step 3 of these four regression models, shown in Tables 6.3 and 6.4 (columns 4 and 6). Parent-reported conduct problems reduced the gender gap by 11% (to β = .17), and parent-reported hyperactivity reduced the gender gap by 21% (to β = .15). Similarly, teacher-reported conduct problems reduced the gender gap by 37% (to β = .14), and teacher-reported hyperactivity reduced the gender gap by 58% (to β = .08). After adjusting for teacher-reported hyperactivity, the gender-engagement association became quite small, and may have only remained statistically significant due to the large sample size. Peer problems and emotional symptoms did not appreciably reduce the gender gap, explaining at most 5% of the effect of gender on engagement (parent-reported emotional symptoms actually increased the gap by 5%).

Next, all four mental health problems subscales were included as Step 3 of the regression model, to determine if any additional variance in the gender - engagement association could be accounted for when considering all problems together (see Tables 6.3 and 6.4).[21] Simultaneously considering all mental health problems explained a significant

[21] I examined both (1) the 'total difficulties' composite score, and (2) all four specific mental health problems variables entered simultaneously; however, the simultaneous consideration was far superior in terms of explaining the gender gap.

Table 6.3

Standardised Regression Coefficients for Gender, Covariates and Parent-Reported Preschool Mental Health Problems on Reception Classroom Engagement (n = 572)

			Step 3 - parent reported preschool mental health problems				
Variable	Step 1	Step 2	Hyperactivity/ Inattention	Emotional symptoms	Conduct problems	Peer problems	All subscales
Gender	.20***	.19***	.15***	.20***	.17***	.19***	.15***
ATSI		-.11**	-.10**	-.11**	-.10**	-.10**	-.10*
Terms at school		.14***	.14**	.14**	.13**	.13**	.12**
Public/private school		-.11**	-.14**	-.11**	-.12**	-.12**	-.14***
Hyperactivity/inattention			-.23***				-.19***
Emotional symptoms				-.06			.03
Conduct problems					-.18***		-.08
Peer problems						-.12**	-.08*
R^2	.04	.08	.13	.09	.12	.10	.15
ΔR^2		.05	.05	.004	.03	.01	.06
F	22.69***	12.84***	32.56***	2.23	20.24***	8.56**	12.00***

Note. All ΔR^2 Step 3 values refer to change from Step 2. ATSI = Aboriginal/Torres Strait Islander origin. Coefficients are standardised regression coefficients (Betas).

*$p < .05$. **$p < .01$. ***$p < .001$.

Table 6.4

Standardised Regression Coefficients for Gender, Covariates and Teacher-Reported Preschool Mental Health Problems on Reception Classroom Engagement (n = 572)

			Step 3 - teacher reported preschool mental health problems				
Variable	Step 1	Step 2	Hyperactivity/ Inattention	Emotional symptoms	Conduct problems	Peer problems	All subscales
Gender	.20***	.19***	.08*	.19***	.14***	.18***	.08*
ATSI		-.11**	-.11**	-.11**	-.10*	-.11**	-.11**
Terms at school		.14***	.10**	.14***	.15***	.13**	.10**
Public/private school		-.11**	-.11**	-.11**	-.09*	-.12**	-.11**
Hyperactivity/inattention			-.38***				-.35***
Emotional symptoms				-.05			.03
Conduct problems					-.27***		-.05
Peer problems						-.10*	-.02
R^2	.04	.08	.21	.09	.15	.09	.22
ΔR^2		.05	.13	.002	.07	.01	.13
F	22.69***	12.84***	93.14***	1.26	44.55***	5.48*	19.26***

Note. All ΔR^2 Step 3 values refer to change from Step 2. ATSI = Aboriginal/Torres Strait Islander origin. Coefficients are standardised regression coefficients (Betas).

*$p < .05$. **$p < .01$. ***$p < .001$.

amount of the engagement gender gap. It reduced the gender effect by 21% for the parent model (reducing the gender β to .15), and 58% for the teacher model (reducing the β to .08); however, this was no more than was explained when including hyperactivity alone (in both parent- and teacher-reported regression models). Hyperactivity uniquely predicted engagement when considering all problems simultaneously in both parent and teacher models, and peer problems also uniquely predicted engagement in the parent model, though this effect was very small, and only just significant. However, the total models (i.e., including both unique and shared variance) explained 1-2% more variance in engagement than did the regression models with hyperactivity alone. Finally, adding both parent and teacher reports together into the one regression model (see Table 6.5) further reduced the gender gap very slightly, by an additional 5% over that of the teacher-reported regression model in Table 6.4. However, this small change was enough to make the gender gap non-significant (see Table 6.5). Additionally, the total variance explained in engagement increased slightly (by 2%) from that of the simultaneous teacher-reported model.

6.4.4 Does Gender Moderate the Association between Mental Health Problems and Engagement?

Another series of hierarchical regression analyses examined whether gender significantly interacted with the association between mental health problems and engagement.

Firstly, correlations between mental health problems and engagement variables were computed for boys and girls separately, shown in Table 6.6. Then, four simultaneous regressions examined the strength of the unique associations between mental health problems and engagement for boys and girls separately (and separating total and specific, and parent- and teacher-reported mental health problems). This method could not compare any differences statistically, but was instead used to visually determine the nature of any existing gender differences. These regression coefficients are presented in Figures 6.1 (showing parent-reported mental health problems) and 6.2 (showing teacher-reported mental health problems). It can be seen that the strength of the mental health problems - engagement association was remarkably similar for boys and girls when examining teacher-

Table 6.5
Effects of Gender, Covariates and both Parent- and Teacher-Reported Preschool Mental Health Problems on Reception Classroom Engagement (n = 572)

Variable	Step 3
Gender	.07†
ATSI	-.10**
Terms at school	.09*
Public/private school	-.12**
Hyperactivity/inattention (p)	-.09†
Emotional symptoms (p)	.01
Conduct problems (p)	-.08
Peer problems (p)	-.08
Hyperactivity/inattention (t)	-.33***
Emotional symptoms (t)	.02
Conduct problems (t)	-.02
Peer problems (t)	-.002
R^2	.24
ΔR^2	.16
F	14.57***

Note. The $\Delta R2$ Step 3 value refers to change from Step 2 (see Table 6.4). ATSI = Aboriginal/Torres Strait Islander origin); (p) = parent-reported variable; (t) = teacher-reported variable. Coefficients are standardised regression coefficients (Betas).
†$p < .10$. *$p < .05$. **$p < .01$. ***$p < .001$.

reported mental health problems (Table 6.6 and Figure 6.2). For both genders, hyperactivity was the only subscale exhibiting a unique association with engagement, and this association was small and negative. There was also a small but non-significant negative association between conduct problems and engagement for boys, while the association for girls was almost non-existent (Figure 6.2). Slightly more differences existed for parent-reported mental health problems (Table 6.6 and Figure 6.1). As with teacher-reported problems, the only unique association with engagement for boys was hyperactivity, showing a small negative effect. However, hyperactivity, conduct problems and peer problems all showed small negative links with engagement for girls (Figure 6.1). Although the effects were very similar in size, only peer problems reached significance, with the others approaching significance.

Next, the existence of any interaction was examined statistically through four moderated regressions (separating both parent- and teacher-reported mental health

Table 6.6
Correlation Matrix for Preschool Mental Health Problems Variables and Engagement by Gender (n = 575)

	1	2	3	4	5	6	7	8	9	10	11
1. Total problems (p)	-	.71***	.67***	.71***	.60***	.19**	.17**	.07	.10	.14*	-.24***
2. Hyperactivity/inattention (p)	.74***	-	.16**	.44***	.15**	.10	.27***	-.15*	.09	.03	-.18**
3. Emotional symptoms (p)	.64***	.20**	-	.30***	.35***	.11	-.02	.23***	-.03	.06	-.08
4. Conduct problems (p)	.76***	.51***	.33***	-	.24***	.11	.09	-.05	.18**	.12*	-.21***
5. Peer problems (p)	.59***	.12*	.32***	.27***	-	.22***	.09	.18**	.05	.22***	-.18**
6. Total problems (t)	.30***	.31***	.16**	.20**	.13*	-	.68***	.61***	.60***	.65***	-.25***
7. Hyperactivity/inattention (t)	.24***	.33***	.07	.16**	.04	.84***	-	.04	.46***	.16**	-.35***
8. Emotional symptoms (t)	.15*	.10	.22***	.08	.01	.63***	.27***	-	.10	.29***	.01
9. Conduct problems (t)	.26***	.28***	.08	.25***	.05	.79***	.71***	.29***	-	.21***	-.15**
10. Peer problems (t)	.24***	.14*	.12*	.09	.30***	.60***	.28***	.33***	.26***	-	-.11
11. Engagement (t)	-.22***	-.26***	-.04	-.17**	-.08	-.35***	-.41***	-.10	-.35***	-.10	-

Note. Correlations for boys in the bottom diagonal, correlations for girls in the top diagonal. Numbers within each cell may vary slightly, due to a small amount of missing data. (p) = parent-reported variable; (t) = teacher-reported variable.
*$p < .05$. **$p < .01$. ***$p < .001$.

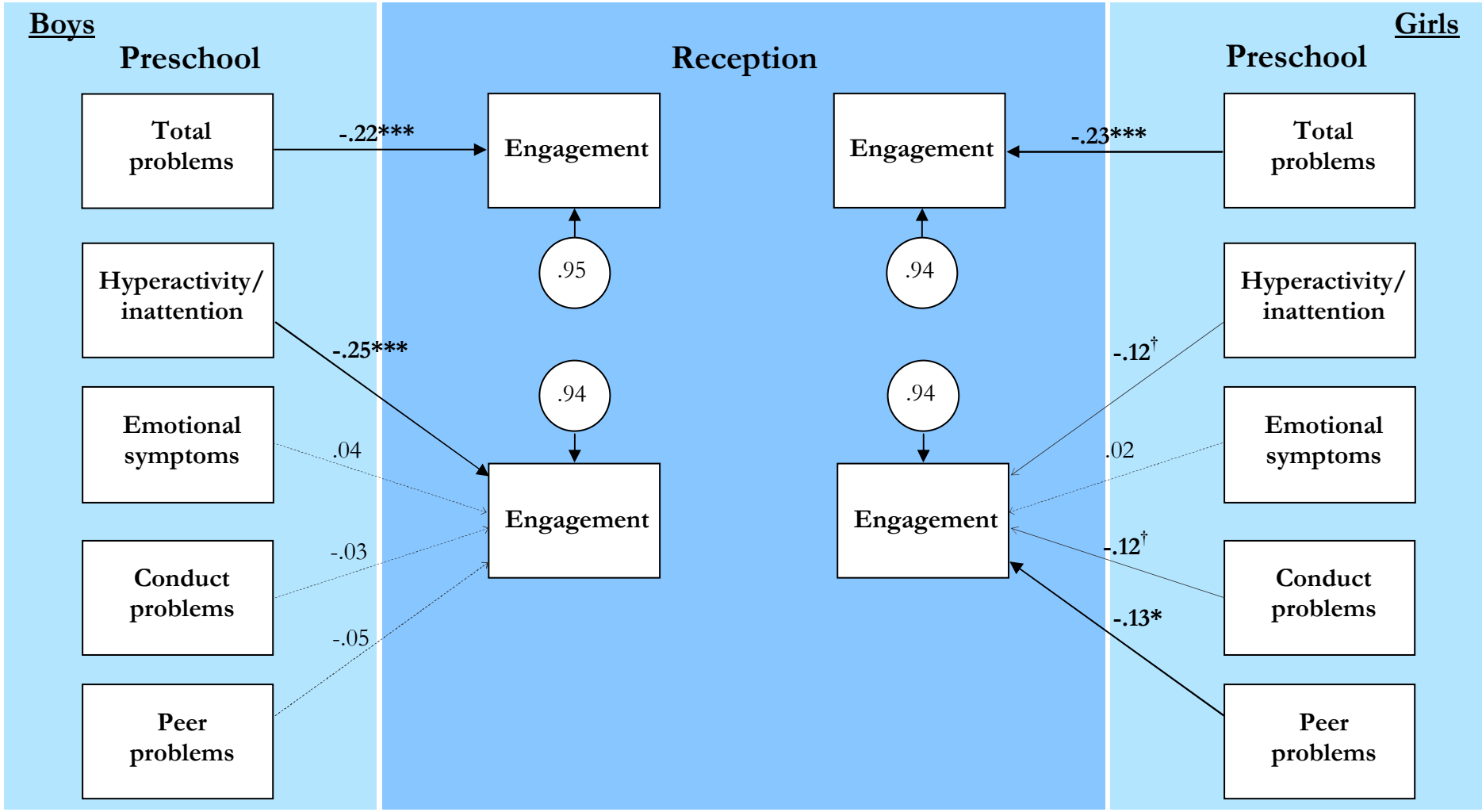


Figure 6.1. Associations between parent-reported mental health problems and engagement. Left-hand path models show standardised regression coefficients for boys (n = 282) and right-hand path models show coefficients for girls (n = 290). Residual error terms (or 'disturbance terms', in circles) are the square root of 1 - R^2. Covariates adjusted for but not displayed. Non-significant paths shown by dashed lines. $^{\dagger}p < .10$. $^{*}p < .05$. $^{***}p < .001$.

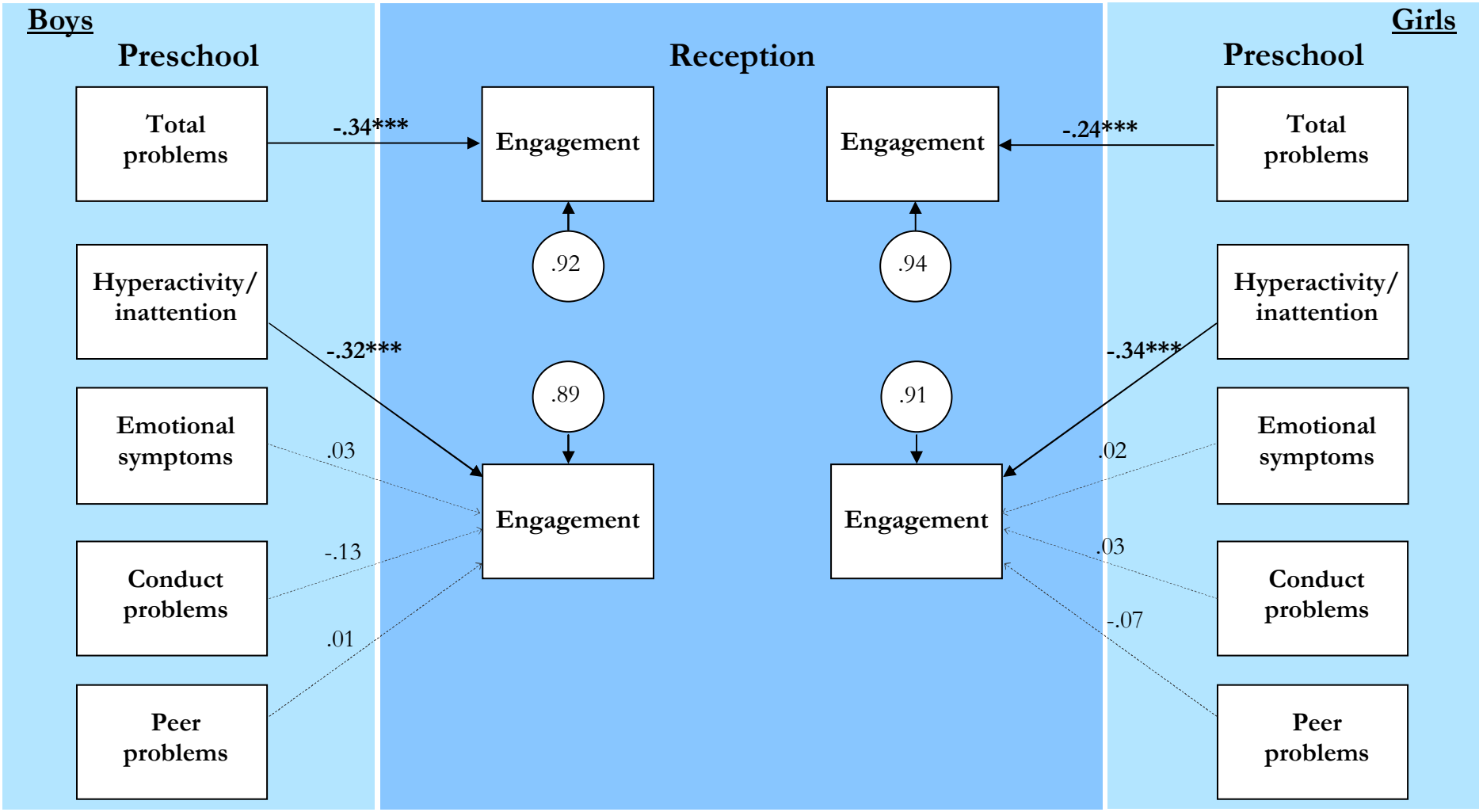


Figure 6.2. Associations between teacher-reported mental health problems and engagement. Left-hand path models show standardised regression coefficients for boys (n = 282) and right-hand path models show coefficients for girls (n = 290). Residual error terms (or 'disturbance terms', in circles) are the square root of 1 - R^2. Covariates adjusted for but not displayed. Non-significant paths represented by dashed lines. ***$p < .001$.

problems, and total and specific problems), with reception classroom engagement again acting as the dependent variable. Covariates were entered at Step 1 in all regressions. For Step 2 of each regression model, either the 'total difficulties' composite variable or all four 'specific problems' variables was entered, along with gender. Finally, in Step 3, interaction terms combining mental health problems and gender were added - there were 10 interaction terms across the four regression models. The results of these regressions are in Tables 6.7 and 6.8.

None of the 10 'mental health problems by gender' interaction terms were significant. Furthermore, only main effects were seen when the interaction terms were plotted, with only the smallest of differences evident between boys and girls (plots not displayed here, but the effect sizes for both genders are demonstrated in Figures 6.1 and 6.2). Finally, subsidiary analyses in which the mental health problems variables were entered singly into separate regressions (to increase the statistical power available to detect interactive effects) also failed to find significant interaction terms.

6.4.5 Profiles of Emotion, Behaviour and Engagement

Finally, a person-centred clustering approach was used to examine specific *patterns* of preschool mental health problems and reception classroom engagement within the sample. This approach provides different information from the variable-centred analyses above: it examines the co-occurrence of symptoms, which is especially pertinent given co-morbidity of mental health problems is not uncommon in young children (Egger & Angold, 2006; Keenan, Shaw, Walsh, Delliquadri, & Giovannelli, 1997; Lavigne et al., 1998). Additionally, distinct subgroups of boys and girls may show different patterns of mental health problems and engagement levels, which can be masked in variable-centred analyses.

To this end, two-step cluster analysis (an exploratory multivariate technique) was employed to identify naturally occurring distinct sub-groups of children within the sample, who are similar to one another on a set of characteristics. Two-step cluster analysis was chosen as other clustering methods do not effectively partition large data sets, and as it is relatively robust to violations of normality (Norušis, 2004; SPSS Inc., 2001). This

Table 6.7
Regression Predicting Classroom Engagement from Parent-Reported Mental Health Problems (n = 572)

	β	R^2	ΔR^2	ΔF
Step 1		.046	.046	9.03***
ATSI	-.11			
Terms at school	.14			
Public/private school	-.12			
Specific problems				
Step 2		.146	.10	13.20***
ATSI	-.10*			
Terms at school	.12**			
Public/private school	-.14***			
Gender	.15***			
Hyperactivity/Inattention	-.19***			
Emotional symptoms	.03			
Conduct problems	-.08			
Peer problems	-.08*			
Step 3		.151	.005	0.94
ATSI	-.10*			
Terms at school	.12**			
Public/private school	-.14***			
Gender	.15***			
Hyperactivity/Inattention	-.39**			
Emotional symptoms	.06			
Conduct problems	.05			
Peer problems	.04			
Gender x hyperactivity	.21			
Gender x emotional	-.03			
Gender x conduct	-.13			
Gender x peer	-.13			
Total problems				
Step 2		.131	.086	28.02***
ATSI	-.10**			
Terms at school	.13**			
Public/private school	-.13**			
Gender	.17***			
Total problems	-.22***			
Step 3		.132	0.001	0.007
ATSI	-.10**			
Terms at school	.13**			
Public/private school	-.13**			
Gender	.17***			
Total problems	-.21			
Gender x total problems	-.01			

Note. ATSI = Aboriginal/Torres Strait Islander origin. Coefficients are standardised regression coefficients (Betas).
*$p < .05$. **$p < .01$. ***$p < .001$.

Table 6.8
Regression Predicting Classroom Engagement from Teacher-Reported Mental Health Problems (n = 572)

	β	R^2	ΔR^2	ΔF
Step 1		.046	.046	9.02***
ATSI	-.11**			
Terms at school	.12**			
Public/private school	-.14**			
Specific problems				
Step 2		.215	.169	24.28***
ATSI	-.11**			
Terms at school	.10**			
Public/private school	-.11**			
Gender	.08*			
Hyperactivity/Inattention	-.35***			
Emotional symptoms	.03			
Conduct problems	-.05			
Peer problems	-.02			
Step 3		.219	.005	0.82
ATSI	-.11**			
Terms at school	.10**			
Public/private school	-.11**			
Gender	.08*			
Hyperactivity/Inattention	-.16			
Emotional symptoms	.04			
Conduct problems	-.25			
Peer problems	.09			
Gender x hyperactivity	-.19			
Gender x emotional	-.01			
Gender x conduct	.19			
Gender x peer	-.12			
Total problems				
Step 2		.17	.12	41.03***
ATSI	-.11**			
Terms at school	.11**			
Public/private school	-.11**			
Gender	.12**			
Total problems	-.30***			
Step 3		.17	.00	0.006
ATSI	-.11**			
Terms at school	.11**			
Public/private school	-.11**			
Gender	.12**			
Total problems	-.31***			
Gender x total problems	.01			

Note. ATSI = Aboriginal/Torres Strait Islander origin. Coefficients are standardised regression coefficients (Betas).
*$p < .05$. **$p < .01$. ***$p < .001$.

procedure combines sequential and hierarchical clustering by (1) first pre-clustering cases into many small sub-clusters, and then (2) clustering the sub-clusters from the previous step. The similarity between clusters was determined using the log-likelihood distance method. Two statistical indices (mentioned earlier) provide guidance on the best cluster numbers. The Schwarz Bayesian Criterion (BIC) is a parsimony criterion used to determine which model fits the data best. Cluster solutions with small BIC values, and with small changes in values between clusters, indicate better fitting models. However, ratios of BIC and log-likelihood change from one clustering step to the next often provide a clearer picture of when clustering has progressed 'too far' and resulted in too few clusters. Cluster solutions with relatively large ratios of minimum inter-cluster distance are preferred, as within-cluster similarity is reduced when merging further.

However, these statistical criteria are merely heuristic devices, as cluster analysis is an exploratory technique designed to always yield clusters, even with random data where no real clusters exist. There is rarely one 'right' solution to the data - several plausible and meaningful clusters may exist, and explain the data equally well (Aldenderfer & Blashfield, 1984; Anderberg, 1973; Speece, 2003). Consequently, interpretation is essential in selecting a cluster solution. The most ideal cluster solution for the current investigation would be consistent with the current hypotheses and make theoretical sense, but also reveal something new and interesting about the data.[22]

Heuristic indices suggested that two to five clusters best represented the data. Generally, a five-cluster solution had the lowest BIC, but was not always considered the 'best' by SPSS, as it also often showed lower ratios of change. After examining variable means for the two- through to five-cluster solutions, the four-cluster solution seemed to best represent the sample, showing the most interesting and clinically-relevant differences. The two-cluster solution (Panel A of Figure 6.3) produced quite heterogeneous groups - broadly, higher and lower functioning groups - which did not show substantial or clinical

[22] As two-step clustering can be affected by the ordering of the data, cluster analysis was run 10 times, each after randomly ordering the data cases. This provided a possible range of best clusters. These possible cluster solutions were subsequently examined for interpretability by examining group means in MANOVA. For each cluster solution (i.e., 2-cluster, 3-cluster), interpretability was compared across the series of 10 cluster analyses. However, cluster solutions were essentially replicated across these 10 different orderings, so only one random ordering was selected for further analysis, and is discussed here.

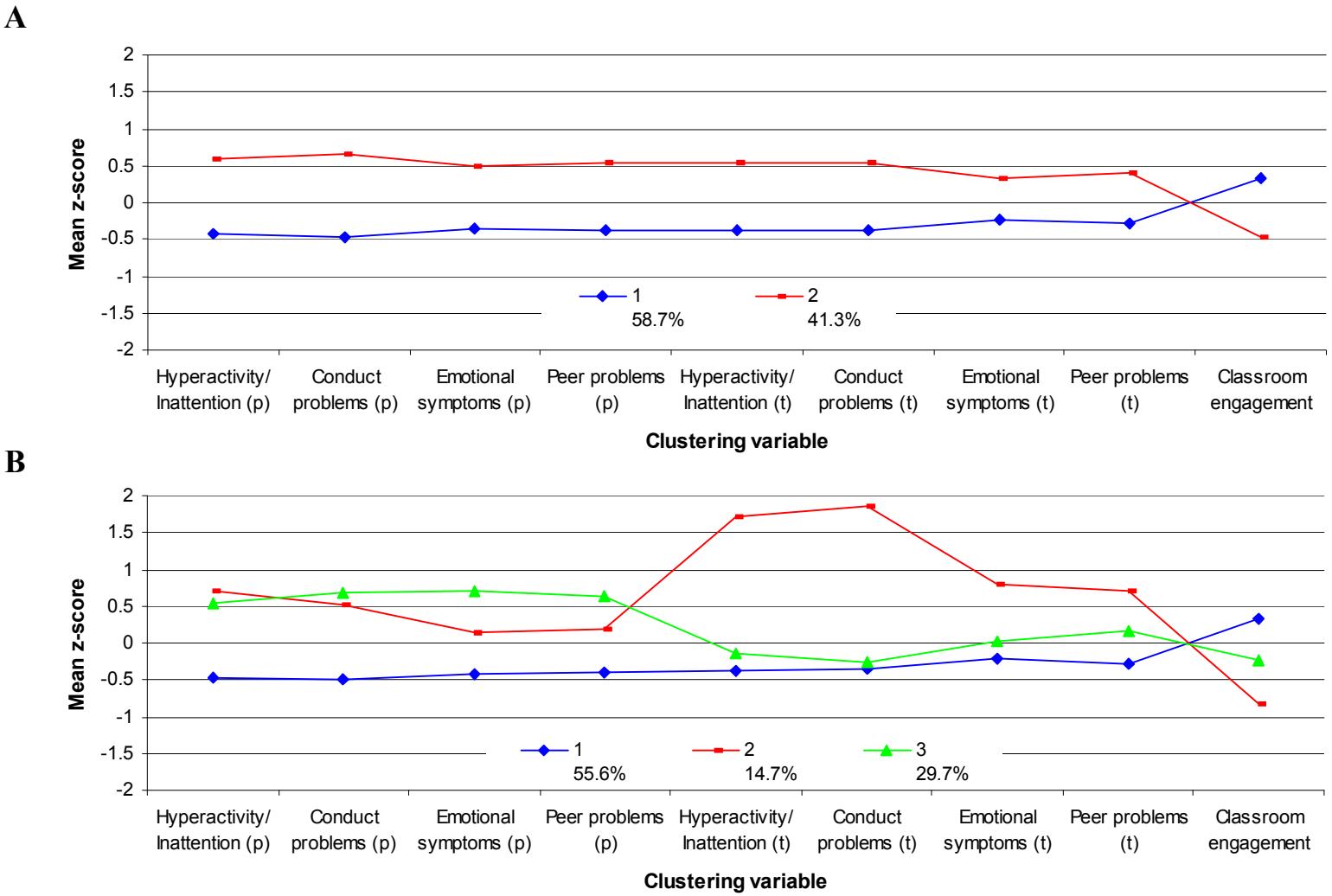


Figure 6.3. Mean mental health problems and engagement *z*-scores for the two-cluster (Panel A) and three-cluster (Panel B) solutions *(n = 572)*. (p) = parent-reported variable; (t) = teacher-reported variable.

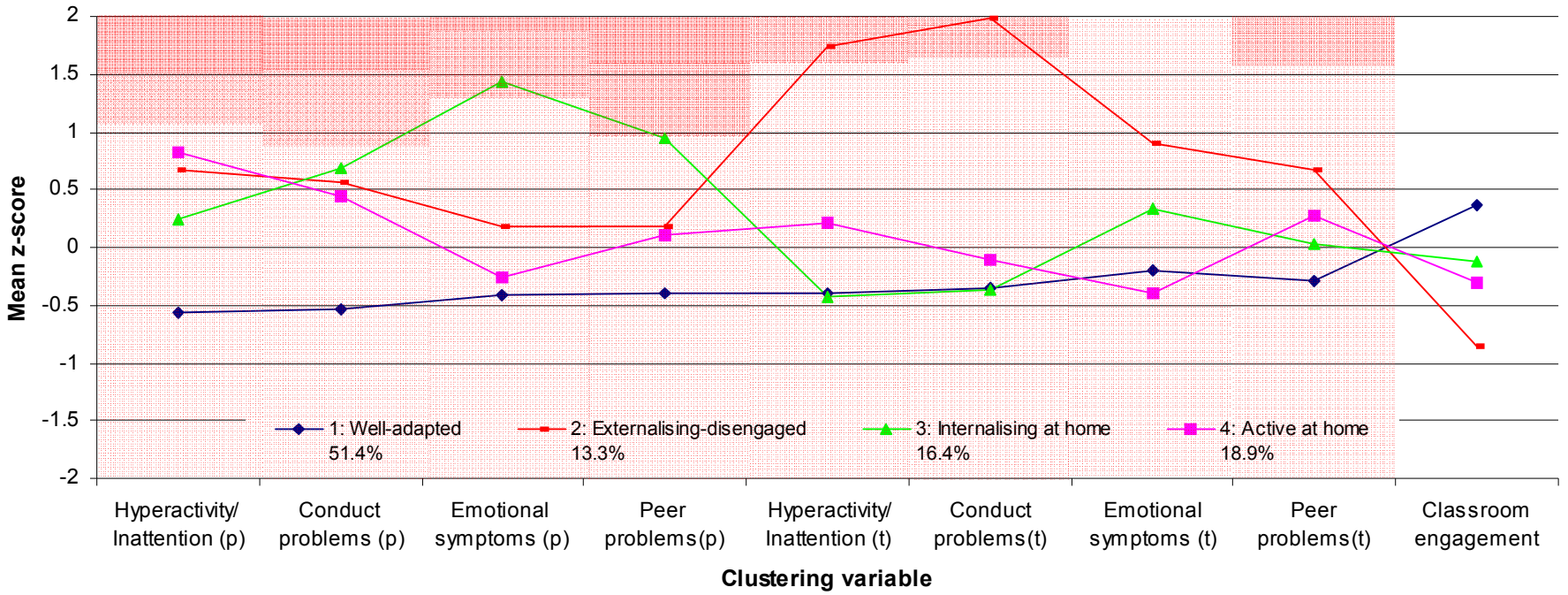


Figure 6.4. Mean mental health problems and engagement *z*-scores for the four-cluster solution *(n = 572)*. (p) = parent-reported variable; (t) = teacher-reported variable. The three shades of red represent the normal, borderline and abnormal cut-points for each subscale (with darker shades indicating higher levels of problems). There is no shading for classroom engagement as this variable does not have cut-points.

differences. Similar higher and lower functioning groups emerged in the three-cluster solution (clusters 1 and 2 in Panel B of Figure 6.3), but cluster means were more extreme, showing greater between-cluster differences. Within this three-cluster solution, the lower functioning group (cluster 2 in Panel B of Figure 6.3) was now mostly characterised by significantly higher teacher-reported hyperactivity and conduct problems scores. The third cluster (cluster 3 in Panel B of Figure 6.3), composed mostly of children from the 'lower functioning' cluster in the two-cluster solution, was characterised by elevated parent-reported mental health problems scores: levels of hyperactivity and conduct problems were similar to the lower functioning group, but levels of emotional symptoms and peer problems were the highest of the three clusters. This cluster generally resembled the higher functioning group on teacher-reported problems, and showed engagement levels in-between those of the higher- and lower-functioning groups. However, for all clusters, all mental health problems scores were still within the 'normal' range.

Interesting clinical differences emerged in the four-cluster solution (see Figure 6.4). The previously described three-cluster groups re-appeared but with more extreme scores, and with the two 'elevated problems' clusters now showing distinct 'internalising' and 'externalising' problems, with scores on these problems in the 'borderline' range. The fourth cluster mostly came from the 'elevated parent-reported' group in the three-cluster solution, and was characterised by the highest parent-reported hyperactivity ratings, at the top end of the normal range. This cluster's level of parent-reported conduct problems was the same as the other two 'problems' groups, but was still in the 'normal' range. These four distinct subgroups represent meaningful differences in the sample. That no real 'abnormal' groups existed demonstrated the generally good functioning of this community sample.

A five-cluster solution was also examined, but rejected, as it did not provide any new information over the four-cluster solution. The first four clusters were almost identical to those in the four-cluster solution, and the fifth cluster was almost identical to the high-functioning cluster, except for a slightly elevated teacher-reported emotional symptoms score.

Table 6.9
Mean Scores on Clustering Variables for the Four-Cluster Solution

Variable	Cluster 1 Well-adapted (n = 294)	Cluster 2 Externalising (n = 76)	Cluster 3 Internalising (n = 94)	Cluster 4 Active (n = 108)	Between-subjects effects χ^2 or F
			Preschool		
Hyperactivity/ Inattention (p) [g]	$2.40_{a, b, c}$ (1.46)	$5.14_{a, d}$ (2.36)	$4.21_{b, d, e}$ (2.06)	$5.52_{c, e}$ (1.75)	222.86***
Emotional symptoms (p) [g]	$1.07_{a, b, c}$ (1.00)	$2.08_{a, d, e}$ (1.76)	$4.24_{b, d, f}$ (1.73)	$1.32_{c, e, f}$ (1.03)	195.83***
Conduct problems (p) [g]	$0.88_{a, b, c}$ (0.94)	2.53_{a} (1.60)	2.71_{b} (1.77)	2.34_{c} (1.22)	181.49***
Peer problems (p) [g]	$0.86_{a, b, c}$ (1.00)	$1.76_{a, d}$ (1.56)	$2.97_{b, d, e}$ (2.03)	$1.64_{c, e}$ (1.26)	112.69***
Hyperactivity/ Inattention (t) [g]	$1.03_{a, b}$ (1.48)	$6.37_{a, c, d}$ (2.32)	$0.94_{c, e}$ (1.14)	$2.55_{b, d, e}$ (2.17)	217.61***
Emotional symptoms (t) [g]	$0.95_{a, b}$ (1.50)	$3.00_{a, c, d}$ (2.58)	$1.96_{b, c, e}$ (2.07)	0.56_{d} (0.87)	80.17***
Conduct problems (t) [g]	$0.23_{a, b}$ (0.63)	$3.47_{a, c, d}$ (1.72)	$0.20_{c, e}$ (0.52)	$0.57_{b, d, e}$ (0.80)	258.24***
Peer problems (t) [g]	$0.93_{a, b, c}$ (1.28)	$2.53_{a, d, e}$ (1.81)	$1.46_{b, d}$ (1.71)	$1.88_{c, e}$ (1.85)	64.90***
			Reception		
Engagement (t)	$40.14_{a, b, c}$ (6.20)	$32.30_{a, d, e}$ (5.20)	$36.99_{b, d}$ (5.09)	$35.86_{c, e}$ (5.48)	43.89***

Note. Means in a row with the same subscript differ significantly at $p < 05$ using Holm's step-down procedure. (p) = parent-reported variable; (t) = teacher-reported variable.
[g] Due to unequal variances across groups, between-subjects effects were analysed using the non-parametric Kruskal-Wallis Test; in these cases, a χ^2 value is reported instead of an F value. Furthermore, post hoc comparisons were conducted using the non-parametric Mann-Whitney Test.
***$p < .001$.

The mean values of clustering variables for each cluster are shown in Table 6.9. Cluster 1 constituted 51.4% of the sample (n = 294). This cluster was relatively well-adapted; all mental health problems scores were in the 'normal' range and below the sample mean, and significantly lower than most other clusters. Their engagement was significantly higher than all other clusters, and was the only group to score above the sample mean. This group was thus labelled 'well-adapted'. Cluster 2 constituted 13.3% of the sample (n = 76). This group scored significantly higher than the 'well-adapted' group

on all mental health problems variables (always above the sample mean), and was the highest-scoring of all clusters on all teacher-reported mental health problems variables. They were particularly characterised by high teacher-reported hyperactivity and conduct problems scores, which were within the 'borderline' range. They also showed significantly lower engagement levels than the other clusters. In particular, the engagement difference between this cluster and the 'well-adapted' cluster was a large effect size (d = 1.37). Thus, this cluster was labelled 'preschool externalising-disengaged'. Cluster 3 represented 16.4% of the sample (n = 94). This cluster scored significantly higher than the 'well-adapted' group on all parent-reported mental health problems variables, and on teacher-reported emotional symptoms and peer problems. They were particularly characterised by the highest scores of all clusters on parent-reported emotional symptoms and peer problems, which were within the 'borderline' range. Although they had significantly lower engagement than the 'well-adapted' group (d = 0.56), it was significantly higher than that of the 'externalising' group (d = 0.91). This cluster was labelled 'internalising at home'. Finally, Cluster 4 constituted 18.9% of the sample (n = 108). This group had slightly (and significantly) elevated scores on all mental health problems variables excepting teacher-reported emotional symptoms, relative to the 'well-adapted' group. It was particularly characterised by its parent-reported hyperactivity score, which was the highest of all clusters, although still within the normal range. Their engagement was considerably lower than that of the 'well-adapted' group (d = 0.73), but higher than that of the 'externalising' group (d = 0.67), and did not differ from the 'internalising' group. This group was labelled 'active at home', due to their elevated but sub-clinical symptoms. It is worth noting that the same pattern of mental health problems occurred within both parent- and teacher-reports for each cluster. For example, both reporters rated children within the 'internalising' cluster as having relatively higher levels of emotional symptoms and peer problems, and relatively lower levels of hyperactivity and conduct problems. This suggested that both reporters were seeing similar problems across the two domains, although often at different levels of severity (perhaps partly an artefact of the subjective

ratings). This cross-informant replication provides evidence for the validity of this cluster solution.

6.4.5.1 Cluster replication.

To assess the reliability of this four-cluster solution, the sample was randomly split into halves (n_1 = 287, n_2 = 285), and cluster analysis (forcing a four cluster solution) was re-run with these two sub-groups. For each sub-sample, similar clusters emerged to those found within the full sample; however, the 'active at home' cluster did not completely replicate in the first sub-group, and the 'internalising at home' cluster did not completely replicate in the second sub-group. It is quite possible that the random splitting of the sample partitioned most of the 'active at home' children into the second sub-group, and most of the 'internalising at home' children into the first sub-group. The fact that each of these clusters was clearly replicated in one of the sub-groups suggests that they were reliable. In total, 65.5% of the sample (63% of group 1, 68% of group 2) was correctly re-classified into the same clusters as the original cluster analysis. Generally children were correctly re-classified, but the suboptimal replication of one of the abovementioned clusters in each sub-group lowered this total classification rate.

6.4.5.2 Gender differences within clusters.

These four clusters were then examined to determine if there was a significant gender difference in the distribution of children across the clusters, using a 4 (cluster) x 2 (gender) chi-square test for independence. The results of this chi-square test are presented in Table 6.10. The chi-square test was significant, indicating that genders were not evenly distributed across the four clusters. It can be seen that there were more girls than boys in the 'well-adapted' and 'internalising' clusters, and more boys than girls in the 'active at home' and 'externalising' clusters. The large standardised adjusted residual value for the 'externalising' cluster suggested that the gender imbalance within this cluster made the most substantial contribution to the significant chi-square value (see the standardised adjusted residual values in Table 6.10). Four two-tailed one-sample binomial tests were conducted to determine exactly which of these proportion differences were significant.

Table 6.10
Gender Differences between Mental Health Problems-Engagement Clusters

		Cluster				
		1	2	3	4	
		Well-adapted	Externalising	Internalising	Active	
Gender		(*n* = 294)	(*n* = 76)	(*n* = 94)	(*n* = 108)	χ^2
Boys	*n*	124	59	38	61	
(*n* = 282)	%	42.2	77.6	40.4	56.5	
	Resid	-3.5	5.3	-1.9	1.7	35.56***
Girls	*n*	170	17	56	47	
(*n* = 290)	%	57.8	22.4	59.6	43.5	
	Resid	3.5	-5.3	1.9	-1.7	
Binomial test *p* value		.02	< .001	> .10	> .10	

Note. Resid = standardised adjusted residual. Percentages in columns add up to 100%. The significant chi-square statistic indicates that genders were not evenly distributed across the four clusters. The *p* values from two-tailed binomial tests indicate which specific clusters showed disproportionate gender representation.
***$p < .001$.

Only the gender differences seen in the 'well-adapted' and 'externalising' clusters were significant. However, the gender differences seen in the 'internalising' cluster were actually larger than the divide in the 'well-adapted' cluster; these significance level differences may have been due to the small size of the 'internalising' cluster, which was less than one third the size of the 'well-adapted' cluster (see Table 6.10).

6.4.5.3 Validation.

To provide further evidence of the validity of the cluster solution, the four clusters were also compared on mean values of four school outcomes once they reached year 1: school progress, disciplinary action, absence/lateness, and absence from class. The sample size for these analyses was reduced to 547, due to attrition between the reception and year 1 assessments. A one-way MANOVA (adjusting for the three covariates) found that mean scores differed significantly between clusters for all four dependent variables (see Table 6.11). Generally, the 'well-adapted' children fared the best on the four outcome measures, while the 'externalising' group fared the worst. Specifically, post-hoc testing indicated that

Table 6.11
Differences in School Outcomes between Mental Health Problems-Engagement Clusters

	Cluster				Between-subjects effects
	1 Well-adapted (n = 281)	2 Externalising (n = 73)	3 Internalising (n = 91)	4 Active (n = 102)	χ^2
Disciplinary action	$4.08_{a,b}$ (1.42)	$6.54_{a, c, d}$ (2.86)	$4.07_{c, e}$ (1.30)	$5.05_{b, d, e}$ (1.93)	81.66***
School absence/ lateness	2.52_{a} (1.09)	2.79 (1.49)	2.71 (1.38)	3.12_{a} (1.70)	11.21*
Absence from class	$1.25_{a, b}$ (0.62)	$1.78_{a, c}$ (0.97)	1.31_{c} (0.63)	1.53_{b} (0.89)	36.60***

Note. Means in a row with the same subscript differ significantly at $p < .05$ using Holm's step-down procedure. Non-parametric Mann-Whitney Test used for post-hoc comparisons due to unequal variances across groups. All between-subjects effects were analysed using the non-parametric Kruskal-Wallis Test, due to unequal variances across groups.
*$p < .05$. ***$p < .001$.

both the 'well-adapted' and 'internalising' clusters showed the lowest level of disciplinary action, and differed from the remaining two clusters. The 'externalising' cluster showed the highest level of disciplinary action, and the 'active at home' showed an intermediate level, and both significantly differed from each other. The 'well-adapted' and 'internalising' clusters showed the same low level of school absence/lateness, although only the 'well-adapted' cluster differed significantly from the 'active at home' cluster, which showed the highest level of absence/lateness. And finally, the 'well-adapted' and 'internalising' clusters showed similar low levels of absence from class, both of which differed from the 'externalising' cluster, which showed the highest levels. The 'active at home' cluster showed an intermediate level, and differed only from the 'well-adapted' group.

6.5 Summary

The purpose of this chapter was to examine associations between specific mental health problems experienced in preschool and classroom engagement in reception, and to determine the role that gender played in this association. In summary, gender differences in both externalising mental health problems and classroom engagement highlighted boys' large disadvantage, even before schooling began. Despite this, mental health problems

appeared to have a pervasive influence on engagement, as the strength of these associations was similar for boys and girls.

Variable-centred regression analyses highlighted boys' higher levels of total and externalising mental health problems, and lower levels of classroom engagement, which were consistent with previous research among young children (Berthelsen & Walker, 2009; Childs & McKay, 2001; Egger & Angold, 2006; Keenan & Shaw, 1997; Ladd et al., 1999; Lavigne et al., 2009; Qi & Kaiser, 2003; Tach & Farkas, 2006). Gender differences were more pronounced in teacher ratings (similar to Collishaw, Goodman, Ford, Rabe-Hesketh, & Pickles, 2009; Offord et al., 1996), although teachers generally rated children as having lower levels of problems than did parents. That no internalising gender differences were found was unsurprising, given that such an effect is often not detected among preschoolers (e.g., Egger & Angold, 2006; Keenan & Shaw, 1997; Lavigne et al., 2009; Qi & Kaiser, 2003). These differences generally emerge in later childhood and adolescence (Costello et al., 2005; Egger & Angold, 2006). Significant effect sizes were generally small to medium, but are concerning given they were found so early in these children's schooling careers. Children's early experiences can shape their academic trajectories, prompting further engagement or withdrawal. Thus, these early gender differences may widen over time (Ready et al., 2005; Tach & Farkas, 2006).

Furthermore, engagement gender differences were mostly an artefact of boys' higher levels of preschool hyperactivity, which accounted for up to 58% of the gender - engagement association. Although conduct and peer problems explained a small portion of the gender effect, they could not add any explanatory power over that of hyperactivity. Clearly, these results show that boys' disadvantage is compounded - not only do they tend to have lower mental health and engagement, but their lower engagement is already partly determined one year earlier, by their levels of preschool mental health problems. This flow-on effect highlights the importance of intervening early, before problems in one domain lead to problems in another. These findings parallel those of research showing that levels of engagement and mental health problems both explain young girls' advantage regarding teacher-child relationship quality, self-control, and literacy and numeracy

learning (Ponitz et al., 2009; Ready et al., 2005; Walker & Berthelsen, 2007, 2009a). It seems sensible that emotional symptoms and peer problems could not explain the gender gap in engagement, given their levels did not significantly differ by gender.

Preschool mental health problems showed a pervasive influence on classroom engagement in reception, as (1) scores on most mental health problems subscales were negatively related to engagement, and (2) these associations did not differ as a function of gender. The strength of mental health problems - engagement associations were remarkably similar across genders, with no significant 'gender x mental health problems' interactions. Other researchers have reported gender interactions with children's mental health problems and language/reading development, where larger externalising effects were found for boys (Doctoroff et al., 2006; Stowe et al., 2000; Willcutt & Pennington, 2000b), and in one study, larger internalising effects were also found for girls (Willcutt & Pennington, 2000b). However, the only study to examine gender interactions between mental health problems and engagement variables in young children also found no interactive effects between externalising-type mental health problems and engagement in preschool children (Escalon & Greenfield, 2009). Furthermore, most specific mental health problems (excepting emotional symptoms) explained a similar amount of variance in engagement when examined separately, and the total variance did not increase appreciably when considering their combined effects simultaneously. Thus, children with problems in any one of the conduct, hyperactivity or peer problems mental health domains are likely to show deficits in their classroom engagement one year later. These results combined suggest that, in general, targeted preschool interventions may be able to identify boys and girls at risk of low classroom engagement in equal measure, using similar mental health problems indicators.

Hyperactivity/inattention showed by far the largest effect on classroom engagement when taking all other mental health problems variables into account, especially when it was rated by teachers. Conduct problems, peer problems and hyperactivity/inattention all showed small bivariate associations with engagement, but for the most part, only hyperactivity had a unique effect on engagement over the shared

influence of all problems (Willcutt & Pennington, 2000b). It was interesting that emotional symptoms showed no relation to engagement whatsoever, regardless of the analysis. Other research has identified associations between emotional problems and engagement among older children (Furrer, Skinner, Marchand, & Kindermann, 2006; Rapport, Denney, Chung, & Hustace, 2001; Roeser, Eccles, & Stroebel, 1998; Wentzel, 1998). Such links may not have emerged in this younger sample as (1) the reliance on parent and teacher reports at this age may make it hard to obtain accurate accounts of children's internal feelings, and (2) young children generally do not experience high levels of emotional symptoms, restricting the range of scores, and possibly preventing associations from emerging. However, factors specific to this sample may also have contributed to the null finding, as small bivariate associations have been found between internalising symptoms and engagement in samples of kindergarten and first grade children, where levels of internalising problems were low (Normandeau & Guay, 1998; Wu et al., 2010).

The person-centred cluster analyses revealed that children with below-average engagement may be identified by distinct patterns of preschool mental health problems, which depended, in part, on their gender. A small sub-group of children, consisting largely of boys, showed high levels of preschool teacher-reported hyperactivity and conduct problems, above-average levels of all other mental health problems, and below average school engagement, which was extremely poor compared with all other groups (similar to sub-groups found by Beg, Casey, & Saunders, 2007; Bulotsky-Shearer, Fantuzzo, & McDermott, 2010; Larsson, Bergman, Earls, & Rydelius, 2004; Luo, Hughes, Liew, & Kwok, 2009; McWayne, Fantuzzo, & McDermott, 2004; Smeekens, Riksen-Walraven, & van Bakel, 2008; Sonuga-Barke, Thompson, Stevenson, & Viney, 1997). In addition to faring slightly worse than girls in general, one in five boys were highly at-risk, experiencing co-morbid problems that affected their schooling outcomes up to two years later. Boys were equally likely to belong to the 'active' cluster, showing similar but lower-level problems. Given their pervasive problems, these young boys may need a more intense and targeted intervention than the broad approach suggested by variable-centred analyses. Another small group, comprised mostly of girls, experienced borderline emotional

symptoms and peer problems, as rated by their parents. Furthermore, these children showed significantly lower levels of classroom engagement than the 'well-adapted' children (consistent with Bulotsky-Shearer et al., 2010). Even though girls generally functioned well, one in five experienced this 'internalising' pattern of problems, which was the most commonly-experienced problem cluster among girls. Although the greater proportion of girls was not statistically significant (as also found by Bulotsky-Shearer et al., 2010), this may have been at least partly due to the small size of this group. These specific patterns of problems may affect even greater proportions of the total preschool population, given the current sample only represented approximately 60% of the wider preschool community, and was fairly high functioning (discussed in chapters 3 and 4). Thus, a more definitive female predominance may exist in actuality. In any case, parents and teachers would benefit from understanding that girls' problems may be more likely to manifest as internalising symptoms, which are easy to overlook given their 'quiet' nature, and that these symptoms may negatively influence subsequent engagement levels.

On the whole, it seems that girls and boys may benefit equally from the same universal intervention efforts. But exactly how could interventions work to improve both the mental health and engagement of young children? Pathways by which children's relationships with adults and their self-concept may boost both mental health and engagement are explored using a process model in the following chapter.

7

LONGITUDINAL PREDICTORS OF CLASSROOM ENGAGEMENT: TESTING THE SELF-SYSTEMS PROCESS MODEL ACROSS THE PRESCHOOL-SCHOOL TRANSITION

7.1 Introduction

The purpose of this chapter was to identify the associations between levels of key preschool variables and the level of children's classroom engagement one year later in reception. The Self-Systems Process Model of Engagement (Connell, 1990; Connell & Wellborn, 1991) was used to test the strength of the associations between parent-child and teacher-child relationship quality and children's self-concept and mental health problems in preschool, and children's classroom engagement in reception (see Figure 7.1). In subsidiary analyses, the frequency of disciplinary action in year 1 was analysed as a dependent variable, thus completing the Self-System Process Model. Analyses were conducted separately for parent- and teacher-reported preschool variables.

7.1.1 Hypotheses.

It was hypothesised that there would be significant positive associations between levels of:

- parent-child relationship quality and children's subsequent classroom engagement
- teacher-child relationship quality and children's subsequent classroom engagement
- children's self-concept and children's subsequent classroom engagement

And a significant negative association between levels of:

- children's mental health problems and children's subsequent classroom engagement

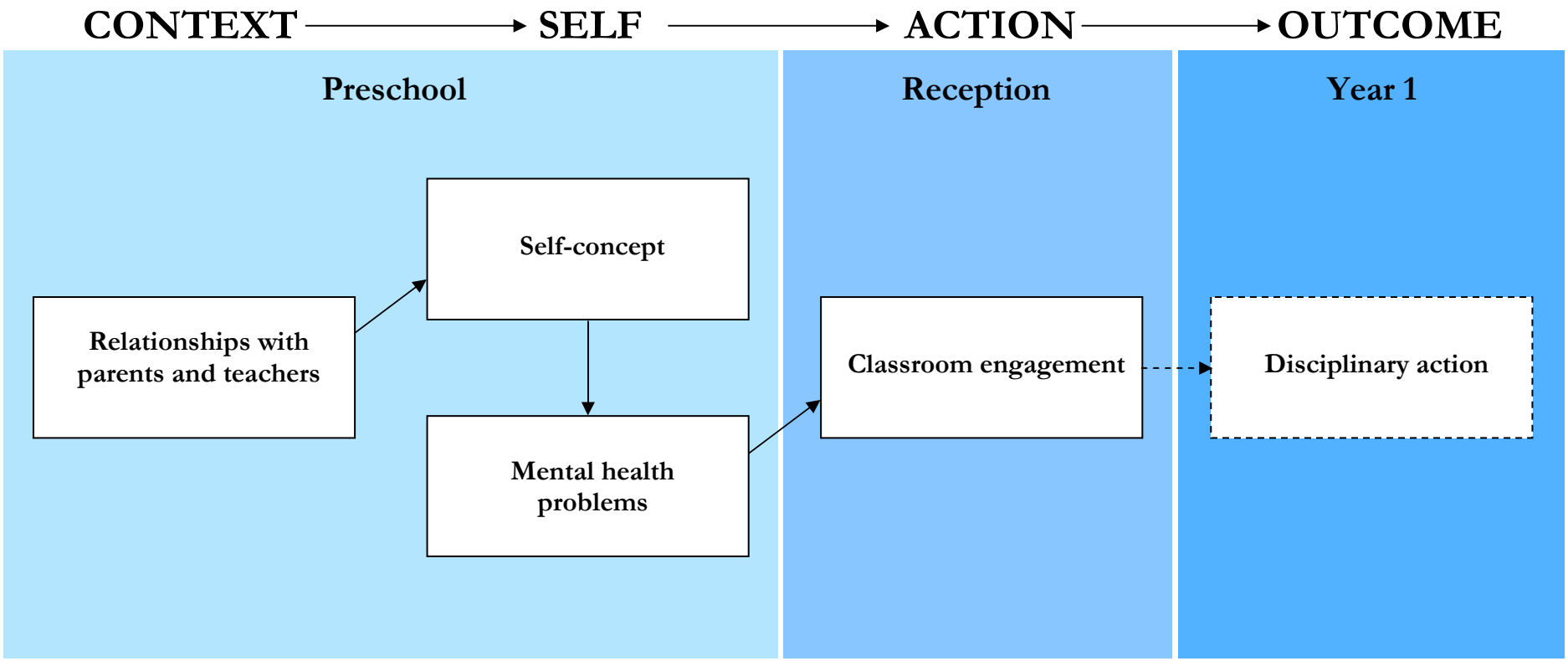


Figure 7.1. The Self-Systems Process Model of Engagement (Connell, 1990; Connell & Wellborn, 1991), as applied to the variables examined within this thesis. The 'disciplinary action' variable (distinguished by dotted lines) was only included in subsidiary analyses, as this chapter's focus was on the predictors of engagement. Though only fully mediating links are illustrated for simplicity, I did not rule out the presence of partial mediation, given such findings within other studies (as discussed in section 2.3.5.1).

Central to this thesis, I also hypothesised two meditational pathways, as modifications to the Self-Systems Model:

- The pathways between teacher-child and parent-child relationship quality and children's classroom engagement would be mediated by children's levels of both self-concept and mental health problems.
- The pathway between children's levels of self-concept and their classroom engagement would be mediated by their level of mental health problems.

7.2 Preliminary Analyses

The results from preliminary analyses conducted to assess preconditions of multivariate analyses are reported in Appendix D. In sum, these results showed that assumptions were largely met, suggesting that it was reasonable to proceed with the statistical analyses presented here.

7.3 Statistical Analyses

Analyses aimed to identify significant predictors of children's classroom engagement, as specified by the Self-Systems Process Model of Engagement (Connell, 1990; Connell & Wellborn, 1991). This model proposes a series of mediating hypotheses. Specifically, children's self-concept mediates the association between their relationships with adults and their classroom engagement (as discussed in detail in section 2.3.5). These associations are considered to be fully mediated (see Figure 7.1). As previously discussed (in section 2.3.5.3), mental health problems was added to the Self-Systems Process model as a mediating variable, hypothesised to be influenced by children's self-concept, and as the only variable directly influencing classroom engagement. Children's classroom engagement is then hypothesised to be the only direct link to children's school outcomes, such as achievement and disciplinary action. These hypothesised pathways between variables were tested using several statistical analyses, conducted in three broad steps. For all analyses, adjustments were made for four covariates of classroom engagement (number of terms at school, Aboriginal/Torres Strait Islander origin, school type in reception (public/private), and gender) (as discussed further in section 6.3 of the previous chapter).

First, each hypothesised mediated pathway of the model (excluding paths to the 'outcome' component, see Figure 7.1) was tested separately through a series of hierarchical multiple regressions. Mediation was tested through a series of three-variable regression chains, using the 'causal steps' approach (Baron & Kenny, 1986; Kenny, Kashy, & Bolger, 1998), and by using the Aroian version of the Sobel statistic (Aroian, 1944; Sobel, 1982). Briefly, the causal steps approach has four criteria for mediation: the independent variable must significantly predict the dependent variable, the independent variable must significantly predict the mediator variable, the mediator variable must significantly and uniquely predict the dependent variable while adjusting for the independent variable, and after adjusting for the mediator, the association between the independent and dependent variables must be significantly reduced. Additionally, the Aroian statistic tests the strength and significance of the indirect effect. A more detailed explanation of the procedure followed to establish mediation is provided in Appendix F. For each process model (i.e., using (1) parent-reported and (2) teacher-reported predictor variables), a series of four three-variable mediational chains could be tested. All pathways were tested after adjusting for covariates at Step 1. By initially examining only three-variable links, the original unmodified Self-Systems Model could be tested prior to the inclusion of mental health problems. However, these three-variable links could establish the pre-conditions for the hypothesised role of mental health problems within the model.

Second, all of these model pathways were examined simultaneously using path analyses in SPSS. This was done through a series of regressions, where each dependent variable was regressed on all variables deemed theoretically prior (Cohen, Cohen, West, & Aiken, 2003). Path analyses provided a more complete test of the *modified* Self-Systems Process Model by accounting for the effects of relationship quality, self-concept and mental health problems simultaneously. Additionally, the total effect of each independent variable on children's classroom engagement was calculated through the decomposition of direct and total indirect effects. These analyses highlighted which variable had the largest overall impact on classroom engagement. Indirect effects were calculated as products of the coefficients along each path between each independent variable and engagement, and

the total indirect effect of an independent variable on engagement was calculated by summing all indirect effects (Bryman & Kramer, 1990). For each model (parent- and teacher-reported), there were three structural equations. Standardised regression coefficients from each regression become the path coefficients, and residual error terms (or disturbance terms) were calculated as the square root of 1 - R^2 (Bryman & Kramer, 1990).

Third, some subsidiary path analyses were conducted in SPSS, where the frequency of disciplinary action in year 1 was added as the final dependent variable to the modified Self-Systems Model. Though disciplinary action was not the main outcome variable of this thesis, it was included in subsidiary analyses for the sake of completeness, by adding the final 'outcome' component to the Self-Systems Process Model (see Figure 7.1). By conducting these subsidiary analyses, the importance of examining engagement in the first year of school might be verified through its longitudinal prediction of disciplinary action one year later. Verifying the completed Self-System Process Model also provided further construct validity for the modified engagement scale (developed and validated in detail in chapter 5).

Finally, the results of these path analyses were verified using structural equation modelling within AMOS version 17.0.0 (Arbuckle, 2008). This also allowed the overall goodness of fit of models to be examined: χ^2, Root Mean Square Error of Approximation (RMSEA, with confidence intervals), the Comparative Fit Index (CFI), Tucker Lewis Index (TLI) and Normed Fit Index (NFI) are reported (as recommended by Boomsma, 2000; Hu & Bentler, 1999; Jaccard & Wan, 1996; Kline, 1998; Raykov, Tomer, & Nesselroade, 1991; Schreiber, 2008). Here, CFI, TLI and NFI values equal to or above .95 were considered to indicate a good fit, as were RMSEA values equal to or lesser than .06 (and with confidence intervals ranging between .00 to .08) (Browne & Cudeck, 1993; Hu & Bentler, 1999; MacCallum, Brown, & Sugawara, 1996). Exogenous variables (i.e., covariates) were treated as uncorrelated (as was the case). All path models were over-identified.

7.4 Results

7.4.1 Correlations between Variables

Bivariate correlations among all model variables (some cross-sectional, some longitudinal) were assessed to determine the strength of the associations between variable scores. The correlation matrix for these variables is presented in Table 7.1. All correlations were in the expected directions, with the majority significant at $p < .05$ or smaller. The exceptions involved the parent-child relationship quality variable, which was not significantly related to engagement, or other teacher-reported variables, including teacher-child relationship quality. Identical variables reported by parents and teachers showed small correlations at around the .20 level, except child relationship quality. All teacher-reported variables were stronger predictors of engagement than were the parent-reported variables. All correlations among teacher-reported variables were larger than the equivalent parent-reported variable correlations. Longitudinal correlations were generally smaller than within-reporter cross-sectional correlations, but were more closely comparable to between-reporter cross-sectional correlations. A fairly large correlation was seen between teacher-reported mental health problems and self-concept (and its constituent variables self-esteem and self-efficacy); however, as detailed in Appendix D, these variables did not show any signs of multicollinearity.

7.4.2 Testing Mediational Pathways within the Self-Systems Process Model

The results of the three-variable mediational regression chains that tested for mediation and the Aroian statistic that tested the significance of the indirect effect are presented in Table 7.2. The two models using parent- and teacher-reported predictor variables are herein referred to as the 'parent' and 'teacher' models, respectively.

7.4.2.1 'Parent' model.

As shown in Table 7.2, most three-variable chains for the 'parent' model met the first three criteria for mediation, with two exceptions (variable chains 3 and 4 in Table 7.2). The first step of the causal steps approach was not met for the association between

Table 7.1
Correlation Matrix for All Process Model Variables (n = 575)

Variable	1	2	3	4	5	6	7	8
				Preschool				
1. Parent-child relationship (p)	-							
2. Self-concept (p)	.51***	-						
3. Mental health problems (p)	-.54***	-.61***	-					
4. Teacher-child relationship (t)	.07	.12**	-.18***	-				
5. Self-concept (t)	.09*	.24***	-.26***	.63***	-			
6. Mental health problems (t)	-.08	-.20***	.27***	-.67***	-.77***	-		
				Reception				
7. Engagement (t)	.06	.15***	-.24***	.24***	.26***	-.34***	-	
				Year 1(n = 547)				
8. Disciplinary action (t)	-.07	-.08	.18***	-.25***	-.20***	.31***	-.35***	-

Note. Sample sizes within each cell may differ slightly, due to missing data. (p) = parent-reported variable; (t) = teacher-reported variable.
* $p < .05$. ** $p < .01$. *** $p < .001$.

parent-child relationship quality and engagement. However, this step is not considered necessary by many researchers, especially where the independent - dependent association is distal (Shrout & Bolger, 2002, see also Appendix F). As the association between parent-child relationship quality and engagement was distally separated by a 1-year period, this first step was not considered necessary in the mediational chain. For this reason, I proceeded to test further for mediation despite the absence of an association between parent-child relationship quality and engagement. The fourth and final criterion for mediation (determining the significance of the mediation effect) is addressed by (1) comparison of values in columns 2 and 5, and (2) examination of the Aroian test statistic in column 6, both of which are shown in Table 7.2. The Aroian *z*-scores showed that indirect effects were significant for all four chains.

The effect sizes and significance levels in columns 2 and 5 (Table 7.2) provide more detailed information on the nature of these indirect effects. Mental health problems fully mediated the association between self-concept and engagement (as demonstrated by the non-significant coefficient of .016 in column 5 of Table 7.2). Self-concept partially mediated the association between parent-child relationship quality and mental health problems (as shown by the significant coefficient of -.311 in Table 7.2). The association

Table 7.2

Tests of Mediation for the Self-Systems Process Model of Engagement across the Preschool-School Transition

Three variable mediational chains (IV → MV → DV)	Criteria for mediation				
	IV → DV β	IV → MV β	MV → DV/IV β	IV → DV/MV β	*Z*
	Parent-reported variables (*n* = 568)				
1. PCR - self-concept - MH	-.531***	.497***	-.442***	-.311***	-8.95***
2. self-concept - MH- engagement	.140***	-.598***	-.206***	.016	4.02***
3. PCR - self-concept - engagement	.065	.497***	.143***	-.006	2.98**
4. PCR - MH- engagement	.065	-.531***	-.254***	-.071	5.06***
	Teacher-reported variables (*n* = 571)				
5. TCR - self-concept - MH	-.648***	.608***	-.566***	-.304***	-12.64***
6. self-concept - MH- engagement	.210***	-.755***	-.328***	-.038	5.29***
7. TCR - self-concept - engagement	.202***	.608***	.136**	.119*	2.62**
8. TCR - MH- engagement	.202***	-.648***	-.292***	.013	5.32***

Note. PCR = parent-child relationship; MH= mental health problems; TCR = teacher-child relationship; IV = independent variable; MV = mediator variable; DV = dependent variable; *Z* = Aroian statistic. Coefficients are standardised regression coefficients.
*$p < .05$. **$p < .01$. ***$p < .001$.

between parent-child relationship quality, self-concept and engagement, and parent-child relationship quality, mental health problems and engagement is less clear. It seems that parent-child relationship quality was only indirectly related to engagement, and was not mediated by either self-concept or mental health problems. As mentioned, bivariate effects are not considered necessary for mediation of temporally distal associations (Shrout & Bolger, 2002). However, the standardised regression coefficients did not change appreciably when controlling for either self-concept or mental health problems (see coefficients in column 5 of Table 7.2). Hence, the 'mediator' variables could not account for the association (or lack thereof) between child-parent relationship quality and engagement. Although the signs of the estimated coefficients changed, they were too small in size for this to be considered a 'suppression' effect.

7.4.2.2 'Teacher' model.

As shown in Table 7.2, all three-variable chains for teacher model met the first three criteria for mediation. Based on the *z*-scores (column 6), all mediation effects were significant; that is, there was a significant reduction in the size of the association between the independent and dependent variables (i.e., the standardised regression coefficient) after controlling for the mediator. Mental health problems fully mediated the association between (1) self-concept and engagement, and (2) teacher-child relationship quality and engagement, as both standardised regression coefficients were reduced to non-significance after controlling for mental health problems (with the effect of self-concept reducing from .210 to -.038, and the effect of teacher-child relationship quality reducing from .202 to .013, see also Table 7.2). However, self-concept only partially mediated the associations between (1) teacher-child relationship quality and mental health problems, and (2) teacher-child relationship quality and engagement, as both standardised regression coefficients remained significant after controlling for self-concept (at -.304 for the effect on mental health problems, and .119 for the effect on engagement, see also Table 7.2).

7.4.3 Testing the Self-Systems Process Path Model

The path coefficients and disturbance terms for the models using parent- and teacher-reported predictor variables are displayed in the path diagrams in Figure 7.2. Further path analysis statistics (i.e., R^2 and F) can be found in Tables E3 and E4 of Appendix E.

Overall, results were very similar across the two path models. Thus, these results are first discussed generally, as they apply to both models. When taking into account all other independent variables simultaneously, only the level of preschool mental health problems was found to have a direct effect on classroom engagement one year later, the effect being small and negative. The remaining two independent (exogenous and intervening) variables only had indirect effects on engagement: self-concept through its moderate negative effect on mental health problems, and (both parent-child and teacher-child) relationship quality through its indirect effects on both self-concept (being positive and moderate) and mental health problems (being small and negative), although the strongest path was through self-concept and then mental health problems to engagement. The strongest direct effects were the concurrent moderate positive links between relationship quality (with both parents and teachers), and children's self-concept, in that relationships characterised by higher levels of warmth and lower levels of conflict led to higher levels of child self-concept (self-esteem and self-efficacy).

Although the significance of each pathway was similar between models, stronger associations were generally seen in the 'teacher' model. In this model, most path coefficients were slightly larger, and the independent variables explained a larger proportion of variance in the dependent variable for each regression equation (Figure 7.2). Overall, 14% of variance in children's engagement was explained by the parent-reported predictor variables, and 17% of variance in children's engagement was explained by the teacher-reported predictor variables (see Tables E3 and E4 in Appendix E).

The pathways comprising these models were then verified using AMOS. The two models were found to fit these data well. The 'parent' model showed an excellent fit according to every fit statistic: χ^2 (10) = 3.8, $p > .05$, CFI = 1.00, NFI = .99, TLI = 1.00,

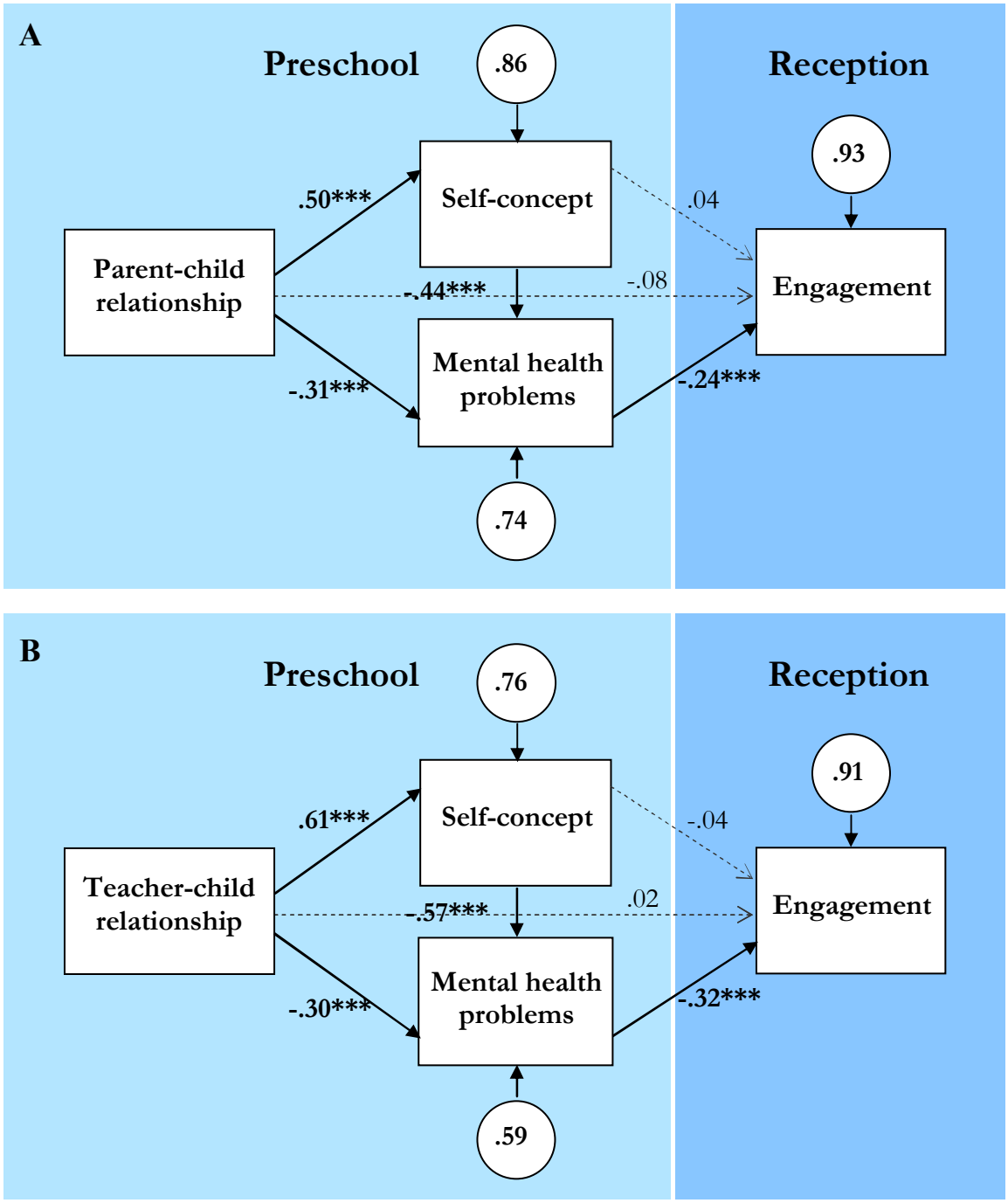


Figure 7.2. Longitudinal path model using the Self-System Process Model of Engagement. Predictors of engagement are relationship quality, self-concept and mental health problems, as reported by parents (Panel A) (n = 568) and preschool teachers (Panel B) (n = 571). Path coefficients are standardised regression coefficients (Betas). Residual error terms (or 'disturbance terms') are calculated as the square root of 1 - R^2, and are displayed in circles. Covariates are adjusted for but not displayed, for ease of interpretation. Non-significant paths are represented by dashed lines.
***p < .001.

RMSEA = 0.00 (lower bound = .00, upper bound = .00). The 'teacher' model showed a significant chi-square value, but nonetheless showed good fit overall: χ^2 (10) = 28.4, p = .002, CFI = .98, NFI = .97, TLI = .95, RMSEA = .06 (lower bound = .03, upper bound = .08). The RMSEA confidence interval for the 'teacher' model suggested that both good and fair fit were plausible.

7.4.3.1 Decomposition of effects.

Path coefficients from the two models above were subsequently used to decompose correlations into direct and indirect effects on children's classroom engagement. All direct, total indirect and total effects of independent variables on engagement are shown in Table 7.3. As the table shows, mental health problems was found to have both the largest direct *and* total effect on engagement, both for 'parent' and 'teacher' models. Child relationship quality and self-concept both had identical small indirect effects on engagement, despite having no direct effect on engagement. Altogether, teacher-child relationship quality had a small total effect on engagement one year later, most of which could be attributed to its indirect effects. However, parent-child relationship quality showed no total effect on engagement due to the small negative direct effect, and small positive indirect effect, which were approximately equal in magnitude, thereby cancelling each other out.

7.4.4 Subsidiary Analyses: Including Disciplinary Action in the Self-Systems Model

The previously conducted path models could not simply be built upon by adding the 'outcome' variable, as there was only disciplinary action data for 547 (95%) of these 575 children, due to attrition in the years between data collection, and missing data. It cannot be assumed that this extended model can also be applied to the full thesis sample. However, when using the reduced sample size, results for all previously tested paths (i.e., the context - self - action model component) were in close agreement with those from the previously reported engagement model (from section 7.4.3). Consequently, it seems likely that the findings for disciplinary action would generalise to the total sample. The 'parent'

Table 7.3
Decomposition of Effects on Engagement for Parent and Teacher Path Models

Variable	Direct effect	Indirect effect	Total effect
Parent-reported (n = 568)			
Parent-child relationship	-.08	.10	.02
Self-concept	.04	.10	.14
Mental health problems	-.24	-	-.24
Preschool teacher-reported (n = 571)			
Teacher-child relationship	.02	.18	.20
Self-concept	-.04	.18	.14
Mental health problems	-.32	-	-.32

Note. Coefficients are standardised regression coefficients (Betas).

and 'teacher' path models are shown in Figures 7.3 and 7.4, respectively (with additional statistical information in Tables E5 and E6 in Appendix E).

As seen in Figures 7.3 and 7.4, the findings for disciplinary action were consistent with the Self-System Process Model of Engagement. Engagement was the most proximal indicator of later disciplinary action, showing small negative associations in both parent-reported and teacher-reported models. In both 'parent' and 'teacher' models (Figure 7.3 and Figure 7.4), preschool mental health problems also showed small positive unique effects on year 1 disciplinary action, though this effect was larger in the 'teacher' model, and approximated the engagement effect size. Furthermore, preschool self-concept also showed a significant unique effect in the 'teacher' model (Figure 7.4). Surprisingly, preschool self-concept was found to have a significant (though small) positive direct effect on year 1 disciplinary action, suggesting that children with high self-esteem and self-efficacy in preschool had a slightly higher frequency of disciplinary action 2 years later.

The significant pathways comprising these models were then verified using AMOS. The two models were found to fit these data well. The 'parent' model showed excellent fit: χ^2 (10) = 3.3, p > .05, CFI = 1.00, NFI = .99, TLI = 1.00, RMSEA = .00 (lower bound = .00, upper bound = .00). Overall, the 'teacher' model showed a good (though not quite as good) fit: χ^2 (10) = 24.6, p = .006, CFI = .99, NFI = .98, TLI = .95, RMSEA = .05 (lower bound = .03, upper bound = .08). The RMSEA confidence interval indicated that both good and fair fit were plausible in the 'teacher' model.

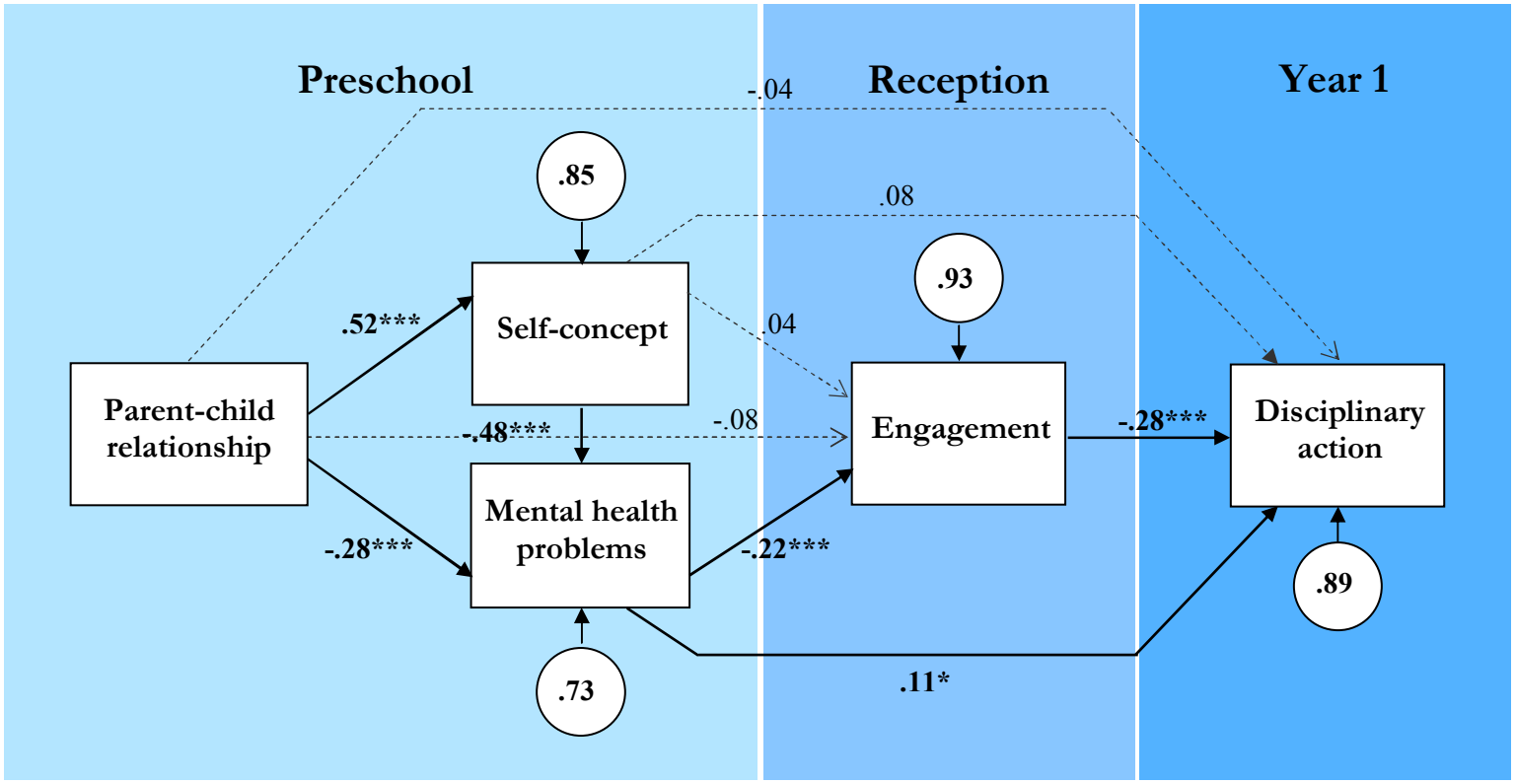


Figure 7.3. Longitudinal path model using the Self-System Process Model of Engagement, containing year 1 disciplinary action as the final outcome variable, and parent-reported preschool variables (i.e., relationship quality, self-concept and mental health problems) (n = 544). Path coefficients are standardised regression coefficients (Betas). Residual error terms (or 'disturbance terms') are calculated as the square root of 1 - R^2, and are displayed in circles. Covariates are adjusted for but not displayed, for ease of interpretation. Non-significant paths are represented by dashed lines.
*p < .05. ***p < .001.

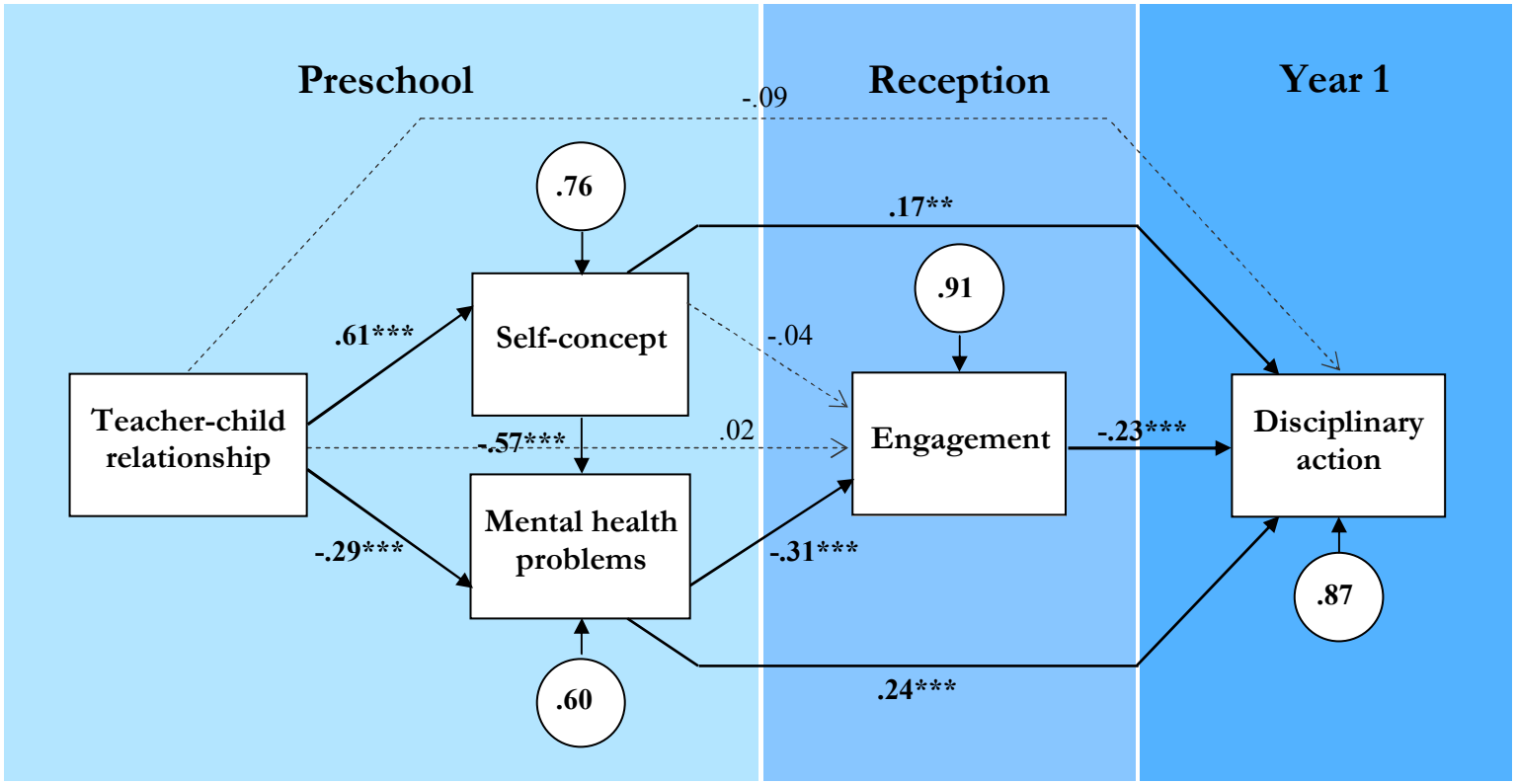


Figure 7.4. Longitudinal path model using the Self-System Process Model of Engagement, containing year 1 disciplinary action as the final outcome variable, and teacher-reported preschool variables (i.e., relationship quality, self-concept and mental health problems) (n = 546). Path coefficients are standardised regression coefficients (Betas). Residual error terms (or 'disturbance terms') are calculated as the square root of 1 - R^2, and are displayed in circles. Covariates are adjusted for but not displayed, for ease of interpretation. Non-significant paths are represented by dashed lines.
**p < .01. ***p < .001.

7.5 Summary

The aim of this chapter was to examine the preschool processes leading to school engagement, using the Self-System Process Model. To my knowledge, this is the first study that has applied all four components of this mediational model longitudinally, by focussing on the role of key adults (i.e., both parents and teachers) in children's classroom engagement across the transition from preschool to school.

Overall, these results support the validity of the Self-Systems Process Model for children in their first school year, and are consistent with previous research that has examined the mediational model in upper elementary and middle school US students (Connell et al., 1995; Connell et al., 1994; Furrer & Skinner, 2003; Skinner et al., 2008; Skinner et al., 1990; Skinner et al., 1998), and the one study that has tested cross-sectional model pathways among children in their first school year (Thijs & Koomen, 2008). Results are also consistent with research examining single bivariate links between selected model variables among young children in the early school years (e.g., Cassidy, 1988; J. N. Hughes et al., 2008; Ladd et al., 1999; Luo et al., 2009; Moss & St-Laurent, 2001; NICHD, 2003; K. E. Perry et al., 2007; Pianta et al., 1997; Verschueren & Marcoen, 1999). Specifically, for models using both parent- and teacher-reported predictor variables, relationships characterised by high levels of warmth and low levels of conflict were related to children's positive self-concepts, characterised by high self-esteem and self-efficacy. In turn, these positive self-concepts were associated with high levels of classroom engagement. Although Self-Systems theory suggests fully mediated paths, both fully and partially mediating paths were found here. Within mediational analyses, teacher-child relationship quality still had a unique effect on classroom engagement after accounting for the mediating role of self-concept. Fully mediating effects are not always empirically borne out, with other studies demonstrating a partially mediated link between teacher-child relationship quality and engagement (Connell et al., 1995; Skinner et al., 2008; Zimmer-Gembeck et al., 2006). Collectively, these findings highlight the potency of the teacher-child relationship for children's school success. However, consistent with the relative importance ascribed to

variables in Self-Systems Theory, the largest effect on each outcome variable was from the variable immediately theoretically prior (Connell & Wellborn, 1991).

It is worth noting that the pathway between parent-child relationship quality and engagement was technically not mediated, but indirect. Although there was no total or direct effect of parent-child relationship quality on engagement, children's relationships with their parents were related to their self-concept and mental health problems, and in turn, their mental health problems were negatively related to their engagement. So overall, parent-child relationship quality had a positive though entirely indirect effect on children's engagement. Regardless of the exact mechanism, parent-child relationship quality was an important variable within this model. Such purely indirect effects can often arise when independent and dependent variables are temporally separated, a process referred to as 'distal mediation' (Shrout & Bolger, 2002).

The role of mental health problems was added as a new link within the model, hypothesised as influenced by relationship quality and self-concept, and as the most proximal cause of engagement. This hypothesis was supported: when added to the Self-Systems Model, the level of mental health problems was predicted by relationship quality directly, and indirectly through self-concept. In fact, when mental health problems was included in the model, it emerged as the only direct predictor of engagement, and as the strongest predictor overall. By including mental health problems within analyses, children's self-concept was no longer directly related to engagement - its direct effect was reduced by 71% within both parent and teacher models.

The bivariate link between mental health problems and engagement was consistent with previous research (e.g., Fantuzzo et al., 2005; Hair et al., 2006; Smart et al., 2008). These results also support research showing that the quality of adult relationships influence children's mental health problems through their self-concept (DuBois et al., 2002; DuBois et al., 1994; J. Kim & Cicchetti, 2004; Yarcheski et al., 2001). However, no other research has combined these two models. Path models still generally supported the Self-Systems model with this new addition. Self-concept and relationships now only influenced engagement indirectly. Mental health problems completely mediated the link

between engagement and both (1) self-concept and (2) relationship quality (although technically this was only an indirect link for parent-child relationships). These findings could be considered as advancement to Self-Systems Theory, as a more proximal and powerful predictor of engagement has been identified. These results further bridge the divide between motivational and mental health research.

Additionally, subsidiary analyses found that children's classroom engagement levels were negatively related to the frequency of disciplinary action in year 1. Whilst engagement is a valued outcome in its own right, the link with later problematic school behaviour highlights its importance in the early years. The small but significant positive link between teacher-reported self-concept and disciplinary action was unexpected, and not predicted by the Self-Systems Model (Connell, 1990; Connell & Wellborn, 1991). However, Connell and colleagues (1995) found a similar effect among adolescent boys. Initially this finding seems counter-intuitive, but several studies have found links between inflated self-concept, and aggression, bullying, and ADHD (Baumeister, Smart, & Boden, 1996; Diener & Milich, 1997; Gresham, MacMillan, Bocian, Ward, & Forness, 1998; Hoza, Pelham, Milich, Pillow, & McBride, 1993; Kaukiainen et al., 2002). Researchers have hypothesised that children with externalising problems and histories of maltreatment inflate self-perceptions as a form of self-protection, to counter feelings of social and academic inadequacy (D. Barnett et al., 1996; Diener & Milich, 1997; J. Kim & Cicchetti, 2003; Vondra, Barnett, & Cicchetti, 1990). However, inaccurate self-concepts are frequently challenged by others. Baumeister and colleagues (1996) suggest that the combination of inflated self-perception and confrontations over threats to this image can result in violent behaviour.

Engagement research has predominantly examined the role of only one type of support (e.g., teacher), with several exceptions (Connell et al., 1995; Furrer & Skinner, 2003; Garcia-Reid, Reid, & Peterson, 2005; A. J. Martin, Marsh, McInerney, Green, & Dowson, 2007; Murray, 2009; Pianta et al., 1997; Ryan, Stiller, & Lynch, 1994; Wentzel, 1998). Furthermore, only one of these studies assessed children in their first year of school (Pianta et al., 1997). In examining the role of both parents and teachers, the preschool teacher-child relationship quality emerged the better engagement predictor overall. There

was no direct or total effect of parent-child relationship quality on engagement. Consequently, the significant paths between the parent-child relationship quality and engagement (through the child's self-concept and level of mental health problems) could only be considered indirect, and not mediated. Conversely, the teacher-child relationship showed a small positive significant total effect on engagement 1 year later. The predictive superiority of the teacher-child relationship is consistent with previous research that has shown a larger effect on engagement from teacher relationships among children in third grade and above (Connell et al., 1995; Furrer & Skinner, 2003; Garcia-Reid et al., 2005; A. J. Martin et al., 2007). The current findings could not be compared directly with those of Pianta and colleagues (1997) as these researchers always gave parent-child relationships greater emphasis, by entering them in an earlier regression step than teacher-child relationships.

In sum, these findings suggest that preschool children with better quality relationships, higher self-concept and fewer mental health problems are more likely subsequently to exhibit higher levels of engagement in classroom learning during their first year of school. Thus, children's relationships with adults, self-concept and mental health in preschool may be useful targets for promotion within interventions to improve their subsequent engagement in the first year of school. However, by examining the sample overall, it is not known whether promoting these factors would also benefit sub-groups of children experiencing high levels of cumulative risk, who have the most to gain from such programs. To address this issue, the same processes will be explored in the following chapter, using a risk and resilience perspective. The effects of cumulative risk on children's engagement will be examined, and the processes associated with engagement that is 'better than expected' given these levels of risk (the definition of resilience) will be explored. The strength of these pathways will also be examined for low- and high-risk children separately, to determine if both groups may benefit equally from these resources during preschool.

8

BOUNCING BACK: A LONGITUDINAL PROCESS MODEL OF EDUCATIONAL RESILIENCE

8.1 Introduction

This chapter applies a resilience perspective to children's classroom engagement, by examining the predictors and processes of children's engagement that is 'better than expected' given their exposure to cumulative family risk (consistent with definitions of resilience). Specifically, this chapter aims to identify potential pathways by which parent-child and teacher-child relationship quality in preschool promote children's educational resilience in reception.

A model synthesised from several interrelated process theories of engagement and resilience was used to guide path analyses (see Connell, Spencer, & Aber, 1994; Friedman & Chase-Lansdale, 2002; Luthar & Brown, 2007; Papandrea, 2005; Rutter, 1987; Sandler, 2001; Sandler, Miller, Short, & Wolchik, 1989; Skinner & Wellborn, 1997; Wyman, Sandler, Wolchik, & Nelson, 2000). In accordance with these theories, relationship quality is treated as an important determinant of resilience, and children's levels of self-concept and mental health problems in preschool were investigated as potential mediators of the associations between parent-child and teacher-child relationship quality in preschool and educational resilience in reception. The path model constructed to measure these associations is herein referred to as the Resilience Process Model, and is illustrated in Figure 8.1.

Consistent with previous chapters, analyses were conducted separately for preschool resource variables reported by parents and teachers.

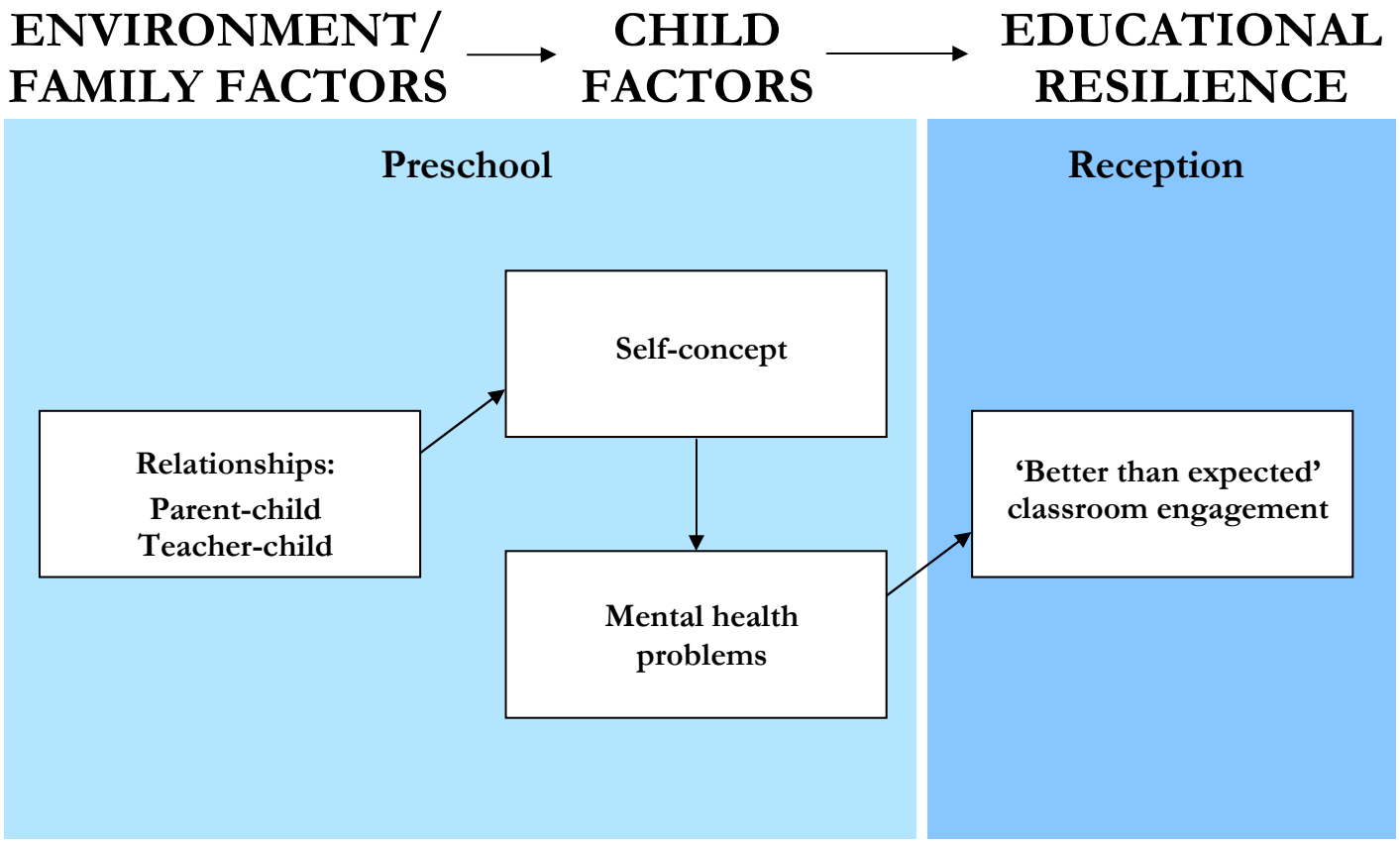


Figure 8.1. The Resilience Process Model, based on resilience and engagement theory (see Connell et al., 1994; Friedman & Chase-Lansdale, 2002; Kilmer, 2006; Luthar & Brown, 2007; Papandrea, 2005; Rutter, 1987, 1990; Sandler, 2001; Sandler et al., 1989; Skinner & Wellborn, 1997; Wyman et al., 2000). Though only fully mediating links are illustrated for simplicity, I did not rule out the presence of partial mediation, given such findings within other studies (as discussed in section 2.4.7).

8.1.1 Hypotheses.

It was hypothesised that there would be significant positive associations between levels of children's:

- parent-child relationship quality and educational resilience
- teacher-child relationship quality and educational resilience
- children's self-concept and educational resilience

and a significant negative relationship between levels of children's:

- mental health problems and children's educational resilience

Furthermore, three meditational pathways were hypothesised:

- The associations between parent-child and teacher-child relationship quality and children's educational resilience would be mediated by children's levels of self-concept.
- The associations between parent-child and teacher-child relationship quality and children's educational resilience would be mediated by children's levels of mental health problems.
- The associations between children's levels of self-concept and their educational resilience would be mediated by their level of mental health problems.

It also was hypothesised that the Process Model pathways would differ by the level of risk children had experienced. Specifically, it was hypothesised that:

- The strength of these associations would be greater for children experiencing high (versus low) levels of risk.

Finally, it was also hypothesised that teacher-child relationship quality would moderate the association between parent-child relationship quality and children's educational resilience. Specifically, it was hypothesised that:

- Teacher-child relationship quality would be more strongly related to educational resilience for children with low levels of parent-child relationship quality, than for those with high parent-child relationship quality.

8.2 Preliminary Analyses

The results from preliminary analyses conducted to assess preconditions of multivariate analyses are reported in Appendix D. In sum, these results showed that assumptions were largely met, suggesting that it was reasonable to proceed with the main statistical analyses.

8.3 Measuring Educational Resilience

A measure of educational resilience was created using the 'resilience residuals' approach (Baldwin et al., 1993; Borman & Overman, 2004; Elder & Conger, 2000; Kim-Cohen et al., 2004) discussed in the Introduction (section 2.5.6.2). This method involved regressing classroom engagement on cumulative risk, and saving the standardised residuals generated from this regression. These standardised residuals represent the variance in engagement that is not predicted by the risk factors examined here, or adaptation that is better or worse 'than expected'. Whilst this variable is labelled 'educational resilience', it is actually a continuous measure ranging from vulnerability to resilience. Positive residuals represent resilience, or an actual engagement score that is better than children's predicted score, and negative residuals represent vulnerability, or an engagement score that is worse than children's predicted score. This educational resilience measure was used as the outcome variable in subsequent analyses.

8.3.1 Quantifying cumulative familial risk

Four different approaches to measuring cumulative risk were taken, using the 10 individual risk variables introduced in methods section 3.2.1.4: Briefly, these 10 variables were stressful life events within the family, parental psychological distress, living in single parent households, being born to an adolescent mother, being born to an adolescent father, low maternal educational qualifications, low paternal educational qualifications, maternal unemployment, paternal unemployment, and receipt of a means-tested pension/benefit.

The first two conceptualisations of cumulative risk were both composite indices. The first was a count score, where risk variables were dichotomised to indicate the

presence (coded 1) or absence (coded 0) of risk, and then summed. The second was a standardised sum, whereby scores on the dichotomous, ordinal and quasi-interval scaled risk variables were standardised and then summed (see Method section 3.2.1.4 for more detail on the creation of these indices). Both of these additive cumulative risk indices could then be entered as independent variables in a multiple regression predicting children's classroom engagement, to generate educational resilience scores. These two conceptualisations assess the *number* or *degree* of risk/s, without considering the *type* of risk experienced. This method therefore assumes that all risks have an equal impact on classroom engagement, and does not take into account any shared variance between risk variables (Burchinal et al., 2000; Luthar, 1993).

For the third and fourth risk conceptualisations, the 10 risk variables (using 'dichotomous' and 'standardised' scaling, respectively) were not summed, but instead entered simultaneously into the regression predicting children's classroom engagement (for examples, see Baldwin et al., 1993; Borman & Overman, 2004; Kim-Cohen et al., 2004). In this way, a child's cumulative risk status still considers multiple risk factors (amount), but also takes into account the unique effect of each risk (type).

From a theoretical viewpoint, no specific cumulative risk conceptualisation was preferred. Instead, the cumulative risk conceptualisation score that explained the most amount of variance in engagement was chosen, as it would ensure the residual scores captured as best as possible children's engagement that was not predicted by risk.

8.3.2 The association between cumulative risk conceptualisations and classroom engagement

Prior to examining the links between the four cumulative risk conceptualisations and classroom engagement, Pearson correlations between each individual risk variable and engagement were computed. In this way, the maximum variance explained in engagement by any one variable could be compared to the amount of variance explained by cumulative risk. These correlations were of small effect size, and ranged from -.02 for being born to an adolescent mother, which was a non-significant effect, to -.20 for low maternal education levels, which was a significant effect (see Table E7 of Appendix E).

All cumulative risk conceptualisations showed a small significant negative effect on classroom engagement one year later (see Table 8.1). However, stronger effects were seen when retaining the full response range of the individual risk variables (i.e., not dichotomising scores), and when entering all risk variables simultaneously into the regression, without summing them (as also found by Ackerman, Izard, Schoff, Youngstrom, & Kogos, 1999; Burchinal et al., 2000). A clear pattern emerged when comparing the variance explained by these risk conceptualisations with the variance explained by maternal education alone. The additive cumulative risk variables (rows 1 and 2 of Table 8.1) that only assessed the number or amount of risk experienced (explaining at most 3.3% variance) were weaker predictors of engagement than the maternal education variable alone (explaining 4% total variance). However, the 'simultaneous' cumulative risk conceptualisations (considering all 10 risk variables simultaneously, rows 3 and 4 of Table 8.1) that considered both the amount *and* type of risk (explaining 5.7% variance) were stronger predictors of engagement than maternal education alone.

Thus, the best predictor of engagement was the fourth cumulative risk conceptualisation, where all 'standardised' risk variables were entered into the regression simultaneously. These results suggest that it is not just the *amount* or the specific *type* of risk experienced that is influences child engagement, but a combination of the two.

For this fourth cumulative risk conceptualisation, most of the variance that each individual risk variable explained in children's engagement was shared. As a consequence, the only unique predictor of engagement was mother's education level (with a Beta of -.18). However, the inclusion of all 10 variables predicted engagement better than the unique effect of mother's education level, due to this shared variance. This demonstrates the expected co-occurrence of familial risk factors.

Table 8.1
The Association between the Four Indices of Cumulative Risk and Classroom Engagement (n = 526)

Cumulative risk conceptualisation	R^2	*F*	*df*
1. Dichotomised count	.023	12.19***	1, 524
2. Standardised sum	.033	17.72***	1, 524
3. Dichotomised simultaneous	.053	2.87**	10, 515
4. Standardised simultaneous	.057	3.13***	10, 515

**$p < .01$. ***$p < .001$.

8.3.3 Educational resilience scores – 'off-diagonal' outcomes

The standardised residuals from the fourth ('standardised simultaneous') cumulative risk conceptualisation were used as the educational resilience scores in all subsequent analyses.[23] These scores are displayed in Figures 8.2 and 8.3. As several children had missing data on at least 1 of the 10 risk variables, 526 of the children were retained in the 'resilience residuals' regression, and were assigned educational resilience scores. Educational resilience scores ($M = 0$, $SD = 1$, by definition) ranged from -3.31 to 2.98. These scores were approximately normally distributed (Figure 8.2). There was only one univariate outlier, a very vulnerable child scoring -3.31; however, it was considered acceptable to have outliers with respect to resilience, given it was designed to measure 'unexpected' adaptation. 'Better than expected' engagement was experienced by 46.8% of the sample ($n = 246$), demonstrated in their positive residual scores, who thus were considered to show some degree of resilience. Conversely, 53.2% ($n = 280$) of the sample experienced 'worse than expected' engagement, demonstrated in their negative residual scores, and thus were considered as vulnerable to some degree.

Figures 8.2 and 8.3 show that that many children's residual scores were close to the mean (of zero), meaning their classroom engagement was fairly consistent with what was predicted based on their level of cumulative risk. Though they received a 'resilience' score, they were not necessarily resilient or vulnerable, as their engagement levels were 'as

[23] In subsidiary analyses, all correlations and path analyses using the resilience residuals score (see the following sections) were also computed using the three alternative resilience scores. Results converged very closely for all four measures of resilience, showing that the actual resilience measure chosen had little effect on results and conclusions drawn.

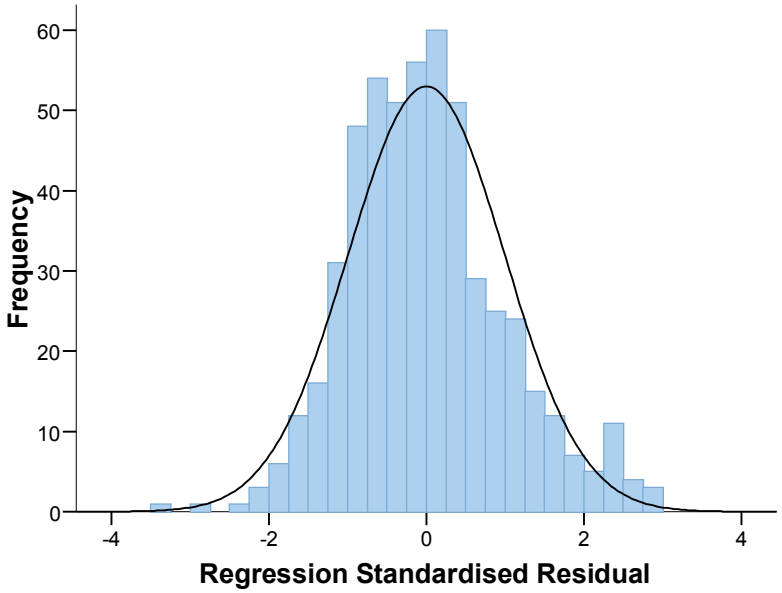


Figure 8.2. The frequency distribution of resilience residual scores (n = 526). Positive residual scores indicate resilience, whereas negative residual scores indicate vulnerability.

expected'. The further children's scores deviated from zero, the more unexpected their adaptation was. For the purpose of illustration, Figure 8.3 highlights the children with residual scores in the top and bottom 25th percentiles. Given their relatively extreme scores, these children's engagement can be considered as *much* better or worse than expected - children who are clearly resilient can be found in the top 25%, shaded in green.

8.4 Statistical Analyses

First, Pearson's correlations and *t*-tests for independence were used to determine whether predictor variables and potential covariates were bivariately related to these educational resilience scores.

Subsequently, several statistical analyses tested the mediational pathways specified within the Resilience Process Model using regression techniques, in SPSS version 15.0 (SPSS, 2006). In all regressions, three covariates that were significantly related to educational resilience (number of terms at school, gender, and school type in reception (public/private)) were adjusted for in the first step. There was a small positive correlation between the number of terms at school and educational resilience, r (525) = .15, p < .01. Additionally, girls (M = 0.22, SD = 0.92) showed greater levels of educational resilience

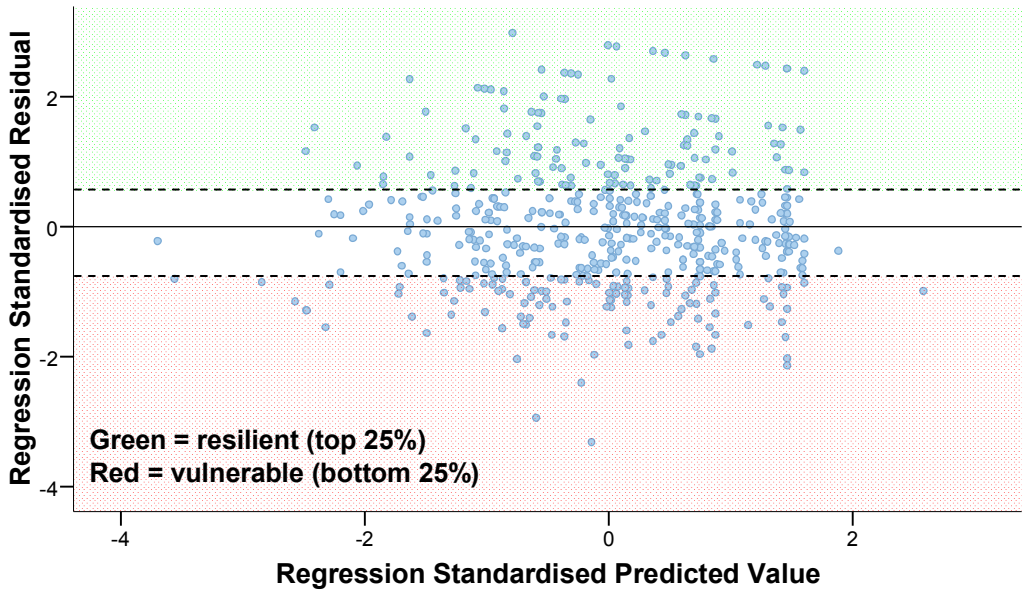


Figure 8.3. The distribution of resilience residual scores, plotted against children's predicted scores (n = 526). Positive residual scores indicate resilience, whereas negative residual scores indicate vulnerability. The top and bottom 25th percentiles (shaded in green and red, respectively) represent the most resilient and vulnerable children in the sample.

than did boys (M = -0.22, SD = 1.01), t (524) = -5.22, p < .001. The exact nature of the educational resilience difference between school type groups (p < .001) cannot be reported here due to confidentiality obligations.

Regression analyses were conducted in two broad steps. First, a series of hierarchical multiple regressions was used to test each hypothesised three-variable mediated pathway within the Resilience Process Model, using the 'causal steps' approach (Baron & Kenny, 1986) and the Aroian version of the Sobel statistic (Aroian, 1944; Sobel, 1982), as seen in the previous chapter (see section 7.4.2), and described in detail in Appendix F.

Second, a series of path analyses were used to provide a more complete test of the Resilience Process Model, and to clarify the associations between model variables, by examining all of the continuous predictors simultaneously. Within hierarchical multiple regression, each dependent variable was regressed on all variables deemed theoretically prior (Cohen et al., 2003). Standardised regression coefficients from each regression become the path coefficients, and residual error terms were calculated as the square root

of 1 - R^2 (Bryman & Kramer, 1990). The first set of path analyses used a continuous measure of resilience, and thus used only multiple regression techniques. A second set of path analyses used a dichotomised version of this resilience measure (with resilience coded as 1, and vulnerability coded as 0) and thus combined logistic regression (for the first equation) and multiple regression (for all subsequent equations). As standardised coefficients are not available within SPSS logistic regression, all continuous predictor variables were first standardised prior to analysis to combine the results of logistic and linear regression analyses in the same path model. By using standardised variables in analyses, the *B* provided in both logistic and multiple regression is equivalent to Beta (β). For logistic regressions, disturbance terms were calculated using Nagelkerke's R^2, which only approximates the R^2 of multiple regression and thus cannot be compared directly to disturbance terms from multiple regression. Finally, a third set of path analyses using the teacher-reported process model were conducted to determine whether teacher-child relationship quality could have a compensatory effect on children's educational resilience, by showing a stronger effect on resilience when parent-child relationship quality was low. To do this, children were first classified as having 'low' and 'high' parent-child relationships using tertile cut-points. Then, the teacher-reported resilience process model was run for the two parent-child relationship groups separately. Beta coefficients and total variance explained could then be compared between the two models to identify any differences.

Finally, the results of these path analyses were verified using structural equation modelling within AMOS version 17.0.0 (Arbuckle, 2008). This also allowed the overall goodness of fit of models to be examined: χ^2, RMSEA with confidence intervals, CFI, TLI and NFI are reported (as recommended by Boomsma, 2000; Hu & Bentler, 1999; Jaccard & Wan, 1996; Kline, 1998; Raykov et al., 1991; Schreiber, 2008). As in chapter 7, CFI, TLI and NFI values equal to or above .95 were considered to indicate good fit, as were RMSEA values equal to or lesser than .06 (and with confidence intervals ranging between .00 to .08) (Browne & Cudeck, 1993; Hu & Bentler, 1999; MacCallum et al., 1996).

Exogenous variables (i.e., covariates) were treated as uncorrelated (as was the case). All path models were over-identified.

8.5 Results

8.5.1 Bivariate Associations between Hypothesised Protective/Promotive Factors and Resilience Residual Scores

Correlations between educational resilience scores and all predictor variable scores are shown in Table 8.2. Child-parent relationship quality was not significantly related to educational resilience. However, all other variables showed small significant bivariate correlations with educational resilience. Of these variables, teacher-child relationship quality and self-concept were positively related to educational resilience, and mental health problems was negatively related to educational resilience.

8.5.2 Bivariate Associations between 'Standardised Simultaneous' Cumulative Risk and Hypothesised Protective/Promotive Factors

Additionally, a series of multiple regressions was conducted between the 'standardised simultaneous' cumulative risk conceptualisation and the hypothesised protective/promotive factors, where each protective/promotive factor was regressed on the 10 standardised risk variables (i.e., the 'standardised simultaneous' risk conceptualisation). Results are shown in Table 8.3. All of the parent-reported hypothesised protective/promotive factors showed small significant associations with the cumulative risk conceptualisation. However, none of the teacher-reported hypothesised protective/promotive factors were significantly associated with cumulative risk. Most of the individual risk factors' unique effects were negative (or positive, for the outcome variable of mental health problems), though small, and generally non-significant. This would suggest that their combined effect on the parent-reported protective/promotive factors was also negative (or positive for the outcome variable of mental health problems). Thus, children who had experienced high levels of risk in the immediate family environment were more likely to have parents who reported lower levels of protection within this same environment.

Table 8.2
Bivariate Associations between Hypothesised Protective/Promotive Factors and Educational Resilience

Variable	Educational resilience *r*
Parent-reported (*n* = 524)	
Parent-child relationship	.05
Self-concept	.15***
Mental health problems	-.21***
Teacher-reported (*n* = 525)	
Teacher-child relationship	.23***
Self-concept	.23***
Mental health problems	-.32***

***$p < .001$.

8.5.3 Mediational Analyses

The results of the mediational regression analyses and the Aroian statistic are shown in Table 8.4. Results are discussed for the models using parent- and teacher-reported variables separately. These models are referred to herein as the 'parent' and 'teacher' models.

8.5.3.1 'Parent' model.

Two of the three-variable chains for the 'parent' model met the first three criteria for mediation (see Appendix F for more detail regarding the criteria for mediation). In contrast, the first criterion (column 2 in Table 8.4) was not met for the two chains examining the association between parent-child relationship quality and educational resilience (chains 3 and 4 in Table 8.4). However, as this step is not considered necessary by many researchers, especially where the independent - dependent association is distal (see Appendix F for further detail), the remaining steps were still tested.

Furthermore, two of these four chains met the fourth criterion for mediation, where the independent-dependent association was considerably reduced when adjusting for the mediator (compare columns 2 and 5 in Table 8.4), and the size of the indirect effect was significant, demonstrated through the Aroian *z*-scores in column 6 of Table 8.4.

Table 8.3
The Association between the 'Standardised Simultaneous' Cumulative Risk Conceptualisation and Each Hypothesised Protective/Promotive Factor (n = 526)

	R^2	*F*	*df*
Parent-reported factors			
1. Parent-child relationship	.05	2.73**	10, 515
2. Self-concept	.04	1.99*	10, 513
3. Mental health problems	.05	2.77**	10, 515
Teacher reported factors			
1. Teacher-child relationship	.03	1.53	10, 515
2. Self-concept	.03	1.40	10, 514
3. Mental health problems	.02	1.16	10, 515

*$p < .05$. **$p < .01$.

Specifically, self-concept partially mediated the association between parent-child relationship quality and mental health problems (shown in the significant coefficient in column 5 of Table 8.4), and mental health problems fully mediated the association between self-concept and educational resilience (shown in the non-significant coefficient in column 5 of Table 8.4).

However, results for chains 3 and 4 suggested that the pathway between parent-child relationship quality and educational resilience could only be considered indirect (shown by the significant *z*-scores in column 6 of Table 8.4), and not mediated by either self-concept or mental health problems; effect sizes for these associations (a) were near zero (column 2 of Table 8.4), and (b) did not change appreciably when adjusting for the hypothesised mediator variables (column 5 of Table 8.4). Hence, the 'mediator' variables could not account for the (lack of) association between child-parent relationship quality and educational resilience. Although the coefficient signs changed, the coefficients were too small in size for this to be considered a 'suppression' effect.

8.5.3.2 'Teacher' model.

All but one of the three-variable chains for the 'teacher' model met the first three criteria for mediation (see Appendix F for more detail regarding mediation criteria). The

Table 8.4
Tests of Mediation for the Process Model of Educational Resilience across the Preschool-School Transition

Three variable mediational chains (IV → MV → DV)	Criteria for mediation				
	IV → DV β	IV → MV β	MV → DV/IV β	IV → DV/MV β	*Z*
	Parent-reported variables (*n* = 523)				
1. PCR - self-concept - MH	-.518***	.493***	-.451***	-.295***	-8.93***
2. self-concept - MH - resilience	.132**	-.598***	-.173***	.028	3.21**
3. PCR - self-concept - resilience	.062	.493***	.133**	-.003	2.71**
4. PCR - MH - resilience	.062	-.518***	-.216***	-.050	4.36***
	Teacher-reported variables (*n* = 525)				
5. TCR - self-concept - MH	-.646***	.613***	-.579***	-.291***	-12.65***
6. self-concept - MH - resilience	.175***	-.761***	-.334***	-.083	5.23***
7. TCR - self-concept - resilience	.178***	.613***	.098	Can not test	n/a
8. TCR - MH - resilience	.178***	-.646***	-.289***	.004	4.93***

Note. PCR = parent-child relationship; MH= mental health problems; TCR = teacher-child relationship; IV = independent variable; MV = mediator variable; DV = dependent variable; *Z* = Aroian statistic. Coefficients are standardised regression coefficients (Betas).
**$p < .01$. ***$p < .001$.

exception was that self-concept (acting as a mediator) did not uniquely predict the dependent variable of educational resilience (see column 4 for chain 7 in Table 8.4). As the third criterion for mediation was not met for this chain, it was not tested further for mediation.

All three remaining chains met the fourth criterion of mediation. All three indirect effects were significant, according to the Aroian z-scores (column 6 of Table 8.4). Specifically, self-concept partially mediated the association between relationship quality and mental health problems (as demonstrated by the significant coefficient in column 5 of Table 8.4, for variable chain 5), and mental health problems fully mediated the association between self-concept and educational resilience (as demonstrated by the non-significant coefficient in column 5 of Table 8.4, for variable chain 6). Additionally, mental health problems fully mediated the association between student-teacher relationship quality and educational resilience (shown by the non-significant coefficient in column 5 of Table 8.4, for variable chain 8).

The results for both the 'parent' and 'teacher' models were very similar to those obtained for the process model of classroom engagement tested in the previous chapter (section 7.4.2).

8.5.4 Path Analyses

Subsequently, a series of path analyses testing the pathways established through mediational analyses were conducted for parent- and teacher-reported predictors separately. For each model, there were three structural equations.

8.5.4.1 Resilience operationalised as a continuum.

Path coefficients from a test of the Resilience Process Model are displayed in the path diagrams in Figure 8.4 (with additional details presented in Table E8 of Appendix E). Overall, results were very similar across the 'parent' and 'teacher' path models. Specifically, when taking into account all other independent variables simultaneously, only the level of preschool mental health problems was found to have a significant direct effect on

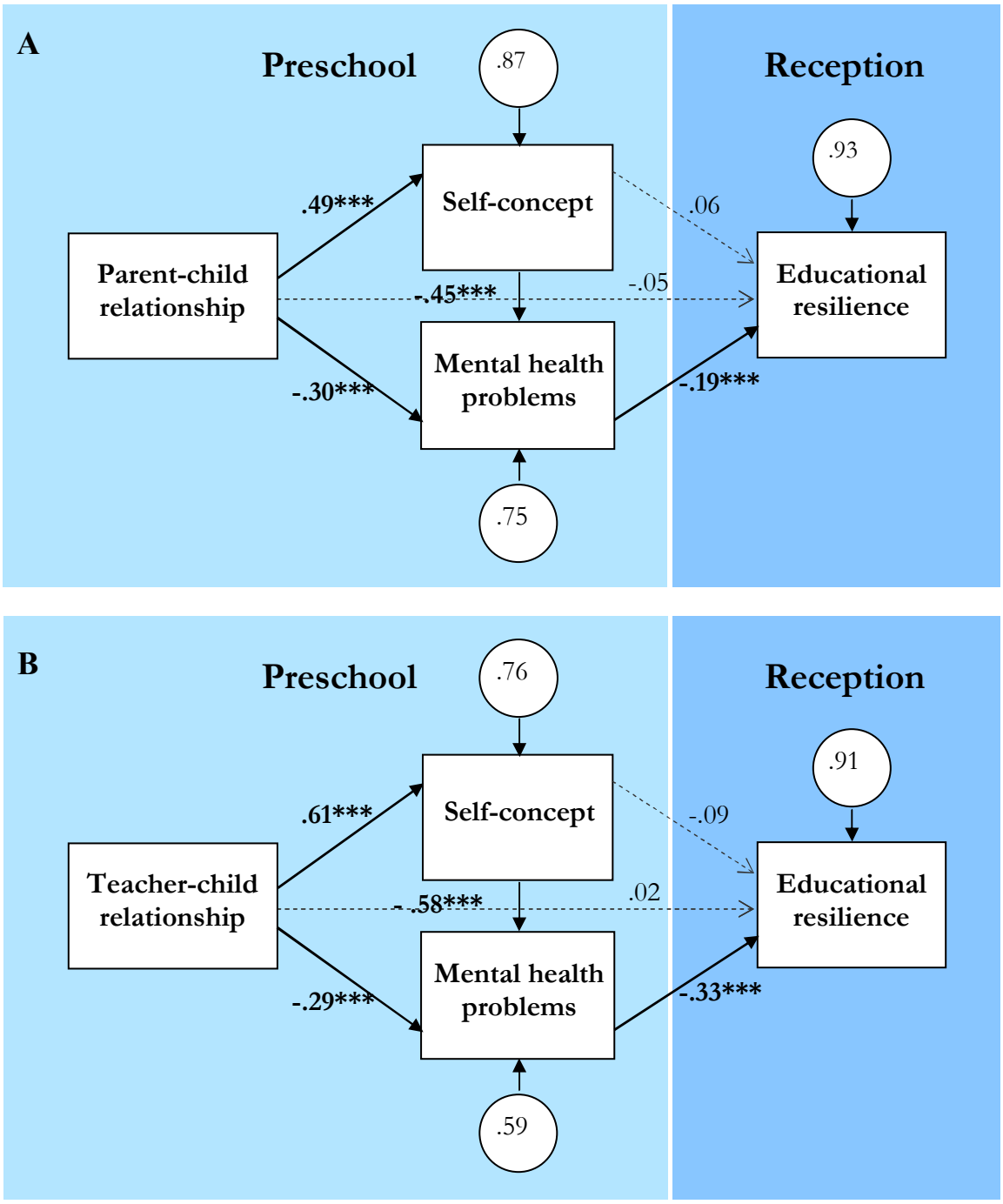


Figure 8.4. Longitudinal process model of educational resilience. Predictors of educational resilience are relationship quality, self-concept and mental health problems, as reported by parents (Panel A) (n = 523) and preschool teachers (Panel B) (n = 525). Path coefficients are standardised regression coefficients (Betas). Non-significant paths are represented by dashed lines. Residual error terms (or 'disturbance terms') are calculated as the square root of 1 - R^2, and are displayed in circles. Covariates are adjusted for in each equation, but are not displayed graphically.
***p < .001.

educational resilience one year later, showing a small negative effect. Relationship quality and self-concept only had indirect effects on educational resilience, through their moderate negative effects on mental health problems (and positive effect on self-concept, in the case of relationship quality).

These results are consistent with the previously-established mediational pathways (Table 8.4). The only difference found between the two sets of analyses was for the 'parent' data. In the mediational analyses, self-concept directly predicted educational resilience when controlling for parent-child relationship quality, and mediated the association between these two variables. However, this direct association disappeared when adjusting for mental health problems as an additional predictor within the path analyses. In other words, self-concept no longer explained variation in educational resilience after accounting for mental health problems. Overall, 14% of variance in children's educational resilience was explained by the parent-reported predictor variables, and 17% of variance in children's educational resilience was explained by the teacher-reported predictor variables (see Table E8 of Appendix E). Results from these path analysis results are also very similar to those for the engagement process model in the previous chapter (section 7.4.3).

The significant pathways comprising these models were then verified using AMOS. The two models were found to fit these data well. The 'parent' model showed an excellent fit according to every fit statistic: χ^2 (6) = 2.5, $p > .05$, CFI = 1.00, NFI = .99, TLI = 1.00, RMSEA = 0.00 (lower bound = .00, upper bound = .03). The 'teacher' model showed a significant chi-square value, but showed adequate fit overall: χ^2 (6) = 27.2, $p < .001$, CFI = .98, NFI = .97, TLI = .92, RMSEA = .08 (lower bound = .05, upper bound = .12). The RMSEA confidence interval for the teacher model suggested that fair through to poor fit was plausible. However, the fit for this teacher model improved when the two non-significant pathways were removed (the direct paths from teacher-child relationship and self-concept to resilience, see Figure 8.4). Specifically, the TLI value increased to .94, and the RMSEA decreased slightly to .07 (lower bound = .04, upper bound = .09), with the RMSEA confidence interval suggesting that good through to mediocre fit was plausible.

8.5.4.2 Supplementary approaches to examining resilience.

8.5.4.2.1 Resilience as occurring in the presence of risk.

As resilience involves adaptation in the presence of risk (Rutter, 1979), one could argue that some children within the current sample should not be included in these resilience analyses, due to their lack of exposure to risk. Technically, all children had experienced some degree of risk according to their 'standardised sum' cumulative risk scores - that is, no-one received the lowest possible standardised score on all 10 risk variables. However, for the children situated at the lower end of the distribution, this 'risk' was very minimal. According to the 'dichotomised count' cumulative risk variable, 72 children (14%) did not experience any 'substantial' risk (see section 4.2.1). For these children, their 'risk' level on the 'standardised sum' risk variable was due to their family experiencing one stressful life event in the past year, at least one parent not being educated at a tertiary (technical college/university) level, and/or only one parent working full-time. Generally, both parents had at least one set of tertiary qualifications between them, and together were working at least 1.5 full-time equivalent positions. Consequently, this level of risk may not have been substantial enough to threaten engagement, making it less legitimate for the children showing good engagement despite this level of 'risk' to be considered resilient.

Thus, to ensure the previous path analysis results could be conceptualised as a response to risk, analyses were re-run after excluding (a) the 14% of children with no risk according to their 'dichotomised count' cumulative risk scores, and also (b) the lowest-scoring 14% of children on the 'standardised sum' cumulative risk score (as these children did not exactly overlap). Results from these analyses converged closely with results when including these children in the full sample (n = 526). For this reason, these children were retained for future analyses.

8.5.4.2.2 Resilience as 'extremely unexpected' adaptation.

One could also argue that resilience may not be best represented by a continuous variable ranging from vulnerability to resilience. Consider that a mean score of zero represents an engagement level that is predicted entirely by a child's level of risk. In this

instance, children display neither resilience nor vulnerability, but instead engagement that is 'as expected'. Furthermore, the degree of influence of the predictor variables for children doing only slightly better than expected could be quite different from those doing much better than expected. And given residual scores contain measurement error, as well as unexplained variance, it is possible that children who score only slightly above zero may actually have a 'true' score that reflects vulnerability.

For this reason, process model results were verified after removing children with 'resilience residuals' scores that were close to the mean (in accordance with methods used by Borman & Overman, 2004; Elder & Conger, 2000; Kim-Cohen et al., 2004). Groups of 'extremely resilient' and 'extremely vulnerable' children were selected by retaining children with 'resilience residual' scores in the top and bottom quarters of the distribution: children with a residual score in the top quarter became the Resilient group (better than expected engagement), and children with a residual score in the bottom quarter became the Vulnerable group (worse than expected engagement) (see Figure 8.3).

The Resilience Process Model was then examined for these two groups of children through path analyses. A hierarchical logistic regression was used for the first equation, predicting Resilient group status (with Vulnerable group status coded 0, as the reference category) from mental health problems, self-concept, and relationship quality (after controlling for demographic characteristics). Then, two hierarchical multiple regressions were used for the second and third equations, predicting mental health problems, and self-concept, respectively.

Results from the Resilience Process Model path analyses were again very similar when considering these groups of Resilient versus Vulnerable children, and when using a reduced sample (see path models in Figure 8.5, and additional information in Tables E9 and E10 of Appendix E). In logistic regressions, a test of the full model against a model only adjusting for demographic covariates was significant for both parent and teacher path models (shown by the Block χ^2 values in Table E9, Appendix E), indicating the predictors as a set reliably distinguished between children in the Resilient and Vulnerable groups. Figure 8.5 indicates that when all predictor variables was taken into account, only

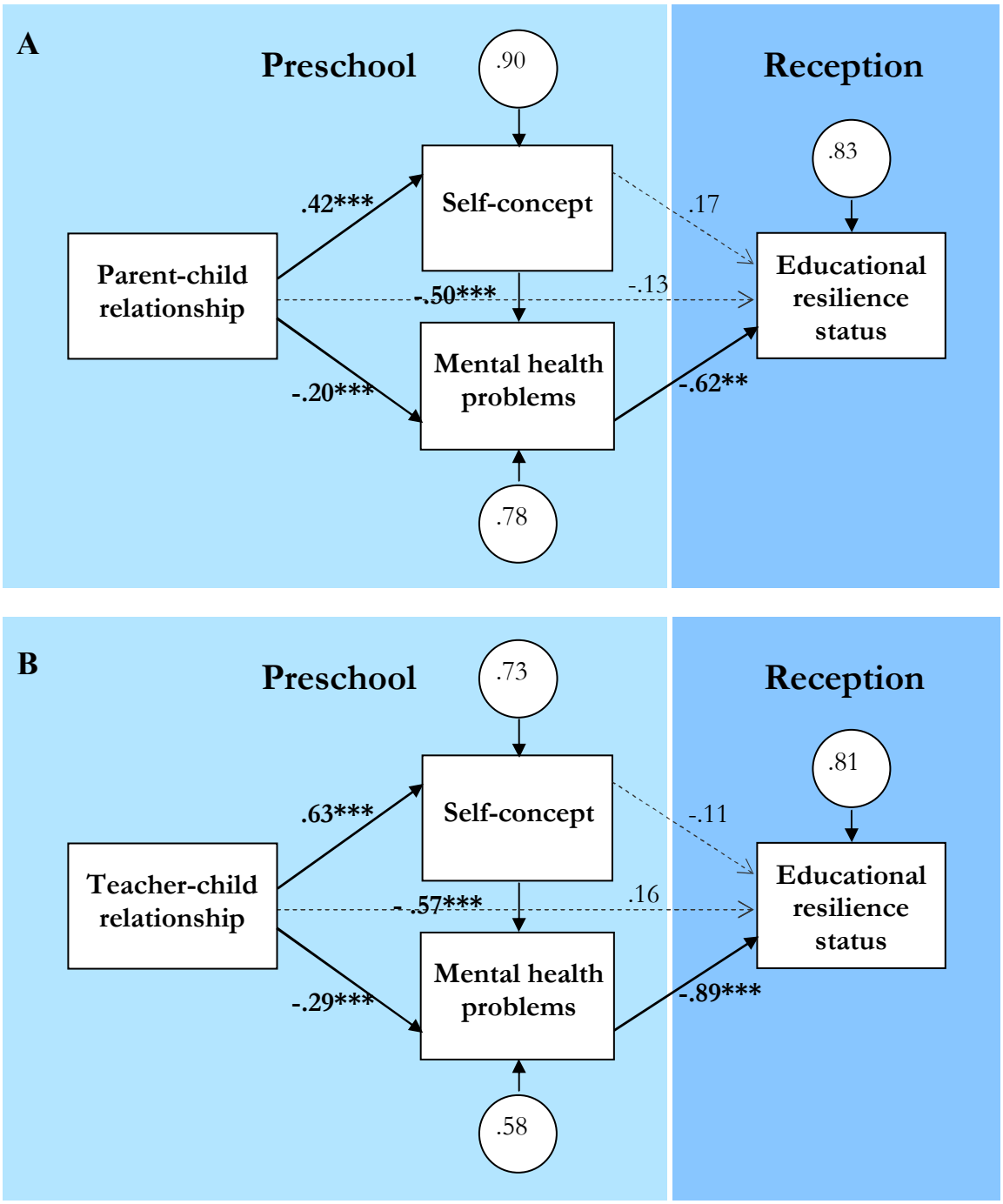


Figure 8.5. Longitudinal process model predicting extreme resilience status (coded 1, and versus extreme vulnerability status). Predictors of educational resilience are relationship quality, self-concept and mental health problems, as reported by parents (Panel A) (n = 264) and preschool teachers (Panel B) (n = 263). Path coefficients are standardised Bs (equivalent to Betas). Non-significant paths are represented by dashed lines. Residual error terms (or 'disturbance terms') are calculated as the square root of 1 - R^2, and are displayed in circles. Covariates are adjusted for in each equation, but are not displayed graphically. **p < .01. ***p < .001.

mental health problems uniquely predicted Resilient group status in parent and teacher path models. For the teacher model, children scoring 1 *SD* higher on the total mental health problems variable were only 41.1% as likely as a lower scoring person to be classified as educationally resilient. For the parent model, children scoring 1 *SD* higher on the total mental health problems variable were only approximately half (53.7%) as likely as a lower scoring person to be classified as educationally resilient. Broadly, these logistic regression results are consistent with the corresponding multiple linear regression paths in the previous 'resilience-as-continuum' path models, with all 526 children (compare with Figure 8.4).

Additionally, the multiple regression paths and significance levels calculated from equations 2 and 3 were very similar to, if not the same as those in the previous 'resilience-as-continuum' path models, even though the sample now only included 50% of those children (n = 264). Again, relationship quality was moderately and positively related to self-concept, and both relationship quality and self-concept were moderately negatively related to mental health problems (Figure 8.5, with additional information in Table E10 of Appenidix E).

Overall, these results would suggest that the pathways specified within the Resilience Process Model are quite robust, regardless of sample size, or the definition of resilience as a continuum or an extreme.

8.5.4.2.3 Resilience as a specific response to high-risk circumstances.

The previous path analyses predicted educational resilience as 'better than expected' engagement given children's level of cumulative risk. However, these analyses examined all children together, regardless of their levels of risk experienced. As discussed in Introduction section 2.4.3, some researchers consider true 'protective factors' to have a stronger beneficial effect on children's developmental outcomes under conditions of risk. Consequently, to determine if these processes differed for high- and low-risk children, the previous path analyses were computed for two groups of children separately, and compared visually (as recommended by Luthar, 2006; Owens & Shaw, 2003; Schoon, 2006).

To create low- and high-risk groups, scores on the 'standardised sum' cumulative risk variable (risk conceptualisation #2, as shown in Table 8.1) were divided into three equal groups (similar to other resilience studies, e.g., Luthar et al., 1993). Using this summed index was preferred over classifying children as low- or high-risk on all 10 risk factors individually. Low risk was defined as scores of ≤ -2.86 (corresponding to the lowest 33.5% of scores), and high risk was defined as scores of ≥ 0.74 (corresponding to the top 34% of scores) on the cumulative risk variable.[24]

Prevalences for each of the 10 separate risk factors comprising the cumulative risk index are detailed for the high-risk children in Table 8.5. It can be seen that this sub-sample had experienced a considerable amount of risk, at a level well above that experienced by the total thesis sample (compare with Table 4.2). These children were living in families characterised by high rates of single parent status and parental distress (with more than half of the parents being significantly distressed), and low educational qualifications. Most children's families were receiving a government-funded pension or benefit, and almost one in two children had experienced at least two stressful life events within the family in the past year.

The results of path analyses predicting the continuous resilience scores for low- and high-risk children are presented in Figure 8.6. Additional information is provided in Tables E11 and E12 of Appendix E. Results using teacher-reported predictor variables were very similar for low- and high-risk children, and mirrored those from the previous analyses where all children in the sample were considered together (in Figure 8.4). Again, only mental health problems predicted educational resilience uniquely and directly (Figure 8.6). Teacher-child relationship quality and self-concept indirectly contributed to educational resilience through their significant effects on mental health problems (and self-concept, in the case of teacher-child relationship quality) (Figure 8.6). However, the association between mental health problems and engagement was stronger under high-risk

[24] The actual percentages of children in the top and bottom thirds of the cumulative risk distribution varied slightly from 33.3% when several children received the same score, resulting in sizeable percentage differences between adjacent scores. In these instances, the score closest to 33.3% was chosen.

Table 8.5
Prevalence of Risk Factors Experienced by the High Risk Children

Risk variable	% (*n* = 179)
Family receiving government pension/benefit	79.8
≥ 1 parent had not achieved at least a high school education	69.1
Primary caregiver clinically distressed	51.7
Family experienced ≥ 2 stressful life events in the past year	45.5
Child living in a single parent family	34.3
Neither parent employed	23.0
Born to ≥ 1 adolescent parent	17.4

conditions (a medium effect size, compared with a small effect size under low-risk conditions). Furthermore, the *overall* effect of the teacher-reported predictors on educational resilience for low-risk children failed to reach significance, whereas the amount of variance explained among high-risk children was significant (see R^2 change and *F* change values in Table E11 of Appendix E).

The path model results were slightly different for the 'parent' model, where some pathways differed across the two risk levels (Figure 8.6). Parent-child relationship quality and self-concept still showed a small negative influence on mental health problems, regardless of the level of risk experienced. However, under low-risk conditions, no variable had a significant direct effect on educational resilience (Figure 8.6), and the *overall* variance these variables explained in resilience was not significant (see R^2 change and *F* change values in Table E12 of Appendix E). Among high-risk children, only self-concept was directly linked to educational resilience, showing a small positive effect.

8.5.4.2.4 Resilience in the context of cumulative risk and poor parent-child relationships: The compensatory role of teacher-child relationships.

The negative association between cumulative risk and each parent-reported protective/promotive factor (section 8.5.2) was consistent with the supposition that parents are also likely to be affected by risk experienced within the family environment, thus creating a 'dual risk' for their children. Thus, for the final set of analyses within this

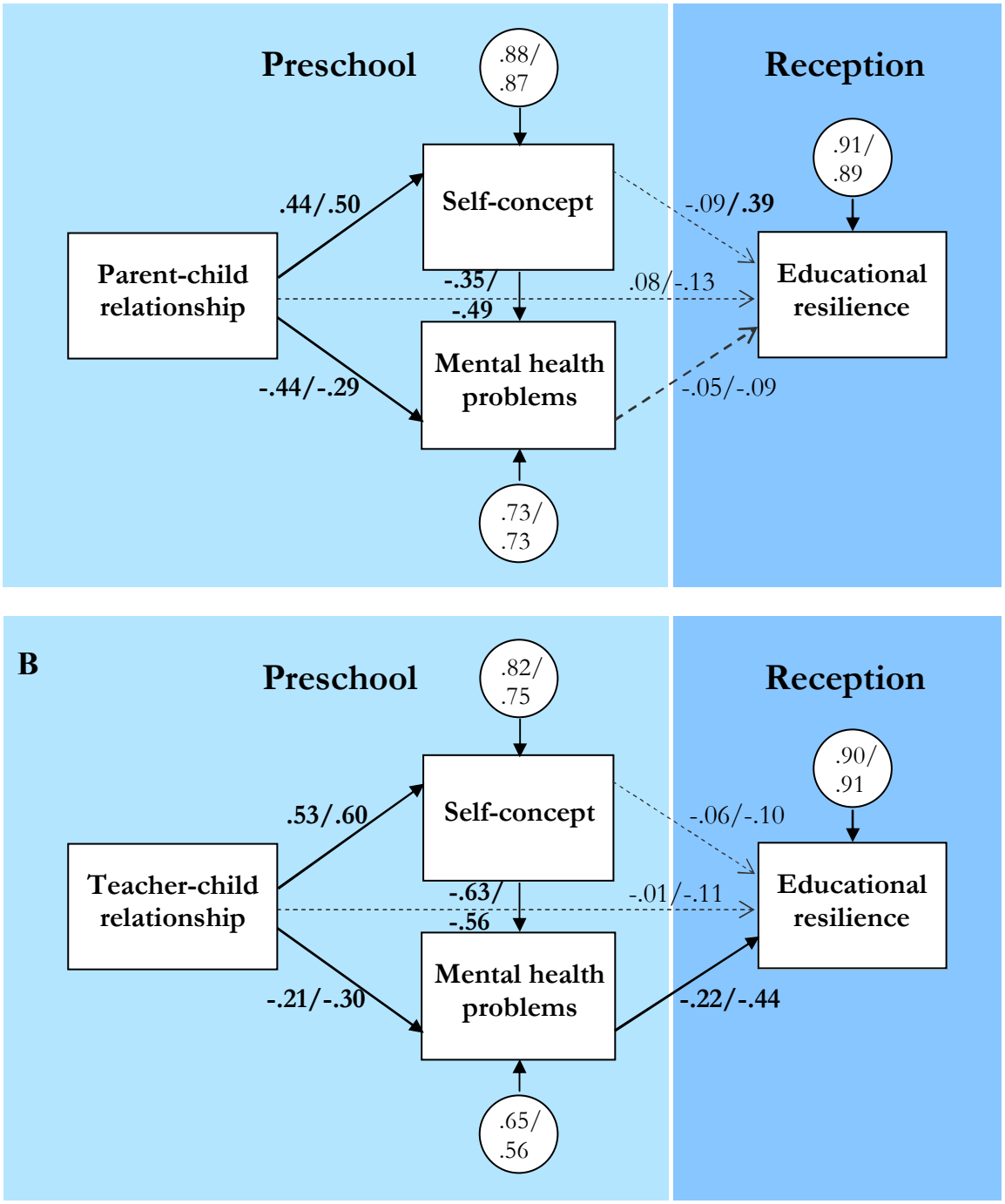


Figure 8.6. Longitudinal process model of educational resilience for low- and high-risk children. Panel A is the model containing parent-reported preschool variables (relationship quality, self-concept and mental health problems) (low-risk n = 175, high-risk n = 178). Panel B is the model containing teacher-reported preschool variables (low-risk n = 175, high-risk n = 179). Path coefficients are standardised regression coefficients (Betas), and are displayed for low- and high-risk children, respectively, within each model. Residual error terms (or 'disturbance terms') are calculated as the square root of 1 - R^2, and are displayed in circles. Covariates are adjusted for in each equation, but are not displayed graphically. Significant effects indicated in bold type (all are significant at $p < .001$).

chapter, poor parent-child relationship quality was considered as a dual risk alongside cumulative familial risk. Additionally, the extent to which good teacher-child relationship quality could compensate for this 'dual risk' in promoting children's educational resilience was examined, using the Resilience Process Model.

To create groups of children who had experienced low and high levels of parent child relationship quality, scores on the parent-child relationship quality variable were divided into three equal groups. Low relationship quality was defined as scores of ≤ 62 (corresponding to the lowest 31.4% of scores), and high relationship quality was defined as scores of ≥ 70 (corresponding to the top 32.2% of scores) on parent-child relationship quality variable.

Path analyses for the 'teacher' process model, conducted for low and high parent-child relationship quality groups separately, are displayed in Figure 8.7. Additional information is provided in Table E13 of Appendix E. In Figure 8.7, it can be seen that the processes by which teacher-child relationship quality was associated with children's educational resilience differed for the two levels of parent-child relationship quality. For children with high levels of parent-child relationship quality, and therefore lower risk (Panel A of Figure 8.7), the previously-established links between teacher-child relationship quality, self-concept and mental health problems still emerged, but none of these variables were directly related to children's educational resilience. But when considered together, the overall variance these variables explained in resilience was significant. This shared variance highlights that while all variables were beneficial, no one variable was uniquely important. However, for children with low levels of parent-child relationship quality, and therefore higher risk (Panel B of Figure 8.7), both teacher-child relationship quality *and* mental health problems showed small significant associations with children's educational resilience. Additionally, this model explained 16% more variance in resilience than the model for children with high levels of parent-child relationship quality (compare R^2 change values in Table E13 of Appendix E).

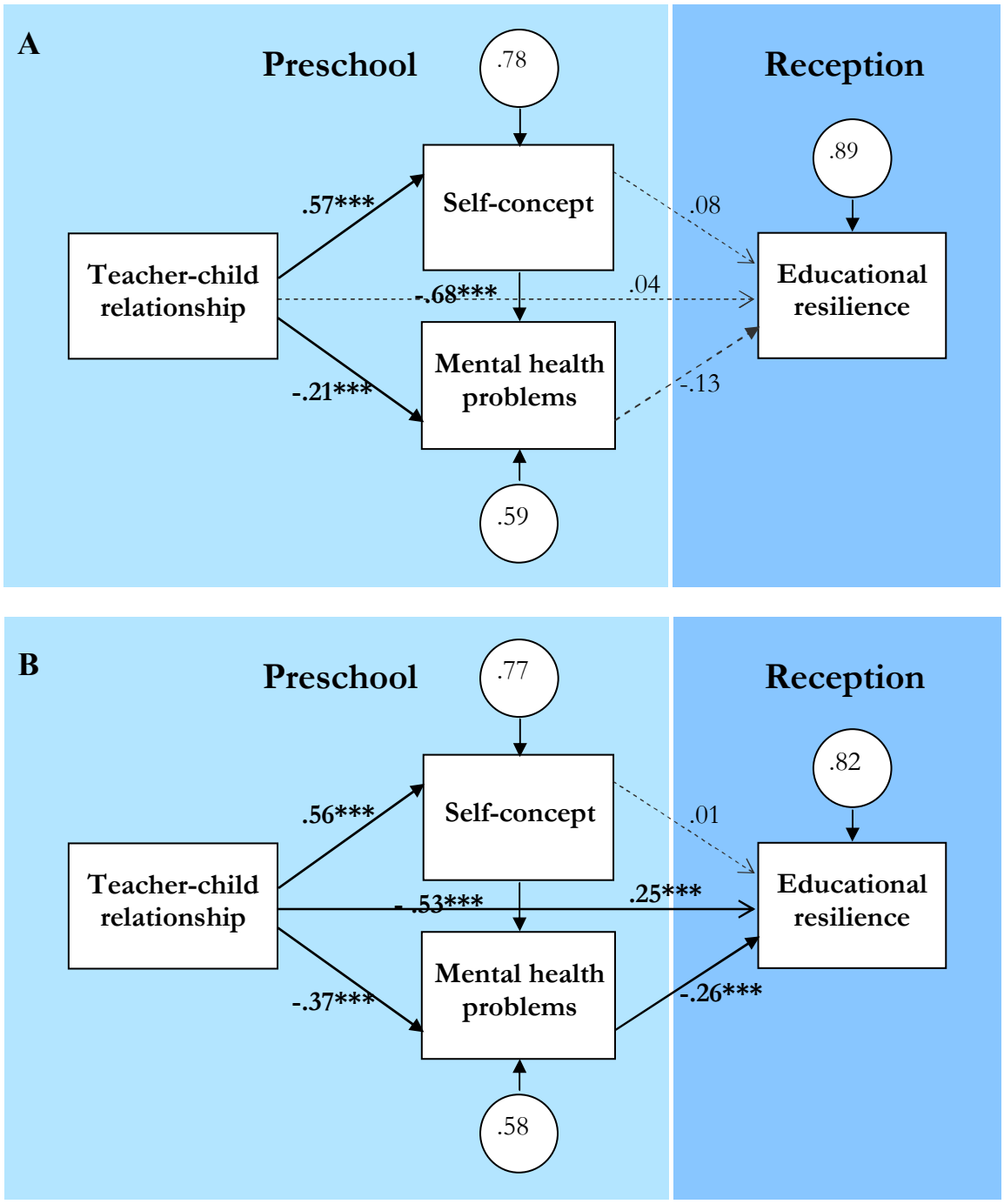


Figure 8.7. Longitudinal process model of educational resilience for children with high and low levels of parent-child relationship quality. Panel A (n = 168) is the path model for the children with higher levels of parent-child relationship quality (and thus, lower risk). Panel B (n = 164) is the path model for the children with lower levels of parent-child relationship quality (and thus, higher risk). Path coefficients are standardised regression coefficients (Betas). Non-significant paths are represented by dashed lines. Residual error terms (or 'disturbance terms') are calculated as the square root of 1 - R^2, and are displayed in circles. Covariates are adjusted for in each equation, but are not displayed graphically. ***p < .001.

8.6 Summary

This chapter examined potential pathways by which the quality of children's relationships may promote their educational resilience. Several main findings emerged from analyses. Firstly, the preschool cumulative risk conceptualisation showed a small significant negative association with children's classroom engagement one year later in reception. This is consistent with the large body of research documenting the negative effects of risk on children's educational outcomes (e.g., Arnold & Doctoroff, 2003; Bronson, Tivnan, & Seppanen, 1995; Brooks-Gunn & Duncan, 1997; Downer, Rimm-Kaufman, & Pianta, 2007; Duncan, Brooks-Gunn, & Klebanov, 1994; Friedman & Chase-Lansdale, 2002; Garmezy, Masten, & Tellegen, 1984; S. Judge, 2005; Rouse & Fantuzzo, 2009). Consistent with current knowledge, the cumulative risk conceptualisation predicted engagement better than any one risk factor in isolation, with both the quality and quantity of risk affecting children's engagement (see Burchinal et al., 2000; Luthar, 2006; Rutter, 1979; Sameroff et al., 1987). The percentage of variance that the cumulative risk index explained in children's engagement was similar to the effect sizes seen in other resilience studies (e.g., Masten et al., 1999; Schoon, 2006).

However, a sizeable proportion of variance in children's engagement remained unexplained. This highlights the central premise of this chapter: children's outcomes are not solely determined by their levels of cumulative family risk, and it is highly likely that other factors are related to children's positive outcomes under high-risk circumstances (i.e., resilience). Supporting this, teacher-child relationship quality, self-concept and mental health problems showed small-moderate bivariate associations with children's educational resilience one year later. These variables are consistently implicated in both positive adaptation and resilience (Doll & Lyon, 1998; Luthar, 2006; Masten, 2001; Masten & Coatsworth, 1998; Werner, 2006). However, parent-child relationship is also usually found to be related to educational resilience in previous research, and it was unclear why such an effect was not found here. Perhaps the fact that these two variables were reported by different informants from different settings (home vs. school) and separated by a one-year period may partially explain the lack of association.

Overall, the Resilience Process Model that guided analyses was supported. Specifically, children's self-concept and mental health problems mediated the pathways between teacher-child relationship quality and educational resilience. Warmer and less-conflictual teacher-child relationships were related to children's positive self-concepts, and higher levels of both of these factors were associated with lower levels of mental health problems. In turn, lower levels of mental health problems were associated with higher levels of educational resilience. Only mental health problems directly influenced educational resilience. The links between parent-child relationship quality and educational resilience could only be considered indirect and not mediated, as there was no direct or total effect of parent-child relationship quality on educational resilience. Nonetheless, parent-child relationship quality can still be considered an important predictor of educational resilience, as it appears to be important for developing children's internal strengths which can be used to help them engage in classroom learning.

Overall, these results verify the role of relationship quality within resilience theory (Connell et al., 1994; Friedman & Chase-Lansdale, 2002; Luthar & Brown, 2007; Papandrea, 2005; Rutter, 1987; Sandler, 2001; Sandler et al., 1989; Skinner & Wellborn, 1994; Skinner & Wellborn, 1997; Wyman et al., 2000). Results are also consistent with the small amount of research that has investigated similar mediating processes, where the association between children's relationships and their positive adaptation was mediated by internal child characteristics (Brody et al., 2002; Connell et al., 1994; DuBois et al., 1994; Gaylord-Harden et al., 2007; J. Kim & Cicchetti, 2004; Sharkey et al., 2008; Wolchik et al., 2008; Wolchik et al., 2006). The fact that the samples and developmental outcome variables differed considerably between these studies highlights the potency of relationship quality for positive development and resilience (Luthar & Brown, 2007). The present results were upheld even when excluding children who (1) had experienced only small amounts of risk (14% of the sample), and (2) were neither resilient nor vulnerable, as their engagement levels were 'as expected' (50% of the sample). This suggests the pathways specified within the Process Model were robust with respect to slight variations in the definition of resilience.

Most of the previously-mentioned resilience process studies examined either high-risk children only, or both low- and high-risk children combined together in analyses. Consequently, it could not be determined whether these processes were specific to high-risk circumstances, and thus indicative of resilience, or instead applicable to high- and low-risk equally, and thus indicative of general competence. Within the current sample, most predictors were found to have general promotive effects, being approximately equally beneficial for low- and high-risk children. However, children's self-concept (as reported by parents) showed a protective effect, being directly and positively related to resilience for the high-risk children only. Path models showed that parent-child relationship quality promoted self-concept in low- and high-risk groups similarly, but self-concept then directly influenced educational resilience only among high-risk children. In the 'parent' path model for low-risk children, no variable was uniquely related to educational resilience, nor were the variables collectively related to educational resilience. Consequently, only parent-reported self-concept could be considered as protective under conditions of high risk. A similar effect occurred in the only study to examine self-system processes among low- and high-risk children separately. Specifically, Sharkey and colleagues (2008) found that self-concept partially mediated the association between teacher-child relationship quality and emotional engagement for high-risk but not low-risk adolescents. Underlying this effect, it may be the case that children's feelings of competence and worth give them the ability to cope with the challenges that cumulative risk presents them. If children do not experience risk, there is little that requires coping with. This may explain why self-concept does not have a beneficial effect on engagement for low-risk children.

The predictor variables examined here have all been identified previously as serving either promotive or protective functions within different studies (e.g., Downer et al., 2007; S. Judge, 2005; J. Kim & Cicchetti, 2004; Ladd & Burgess, 2001; Masten & Coatsworth, 1998; Masten et al., 1988; Masten et al., 1999; Murray, Waas et al., 2008; Sharkey et al., 2008; Werner, 2006; Werner & Smith, 1989). The conflicting results may be due more to methodological differences, as most studies relied on statistical interaction terms to identify protective effects, which can be hard to replicate (as discussed in Introduction

section 2.5.6.2). Additionally, some studies examined bivariate links, whereas others examined the unique variance after adjusting for covariates, thus changing the nature of the variables examined. The only other study to examine the protective role of these particular variables within a process model, to my knowledge, was that by Sharkey and colleagues (2008) which, as just discussed, showed similar protective and promotive processes as those found here.

Children who experienced higher levels of cumulative risk were also more likely to experience lower levels of parent-child relationship quality and parent-reported self-concept, and higher levels of parent-reported mental health problems. This is consistent with research showing that children with higher levels of risk are less likely to have high levels of assets, despite their great need for them, thereby exposing them to a 'double disadvantage' (Masten et al., 2009; Masten et al., 1999; Rutter & Quinton, 1984). As this effect only emerged for the *parent-reported* protective/promotive factors, this may be an informant bias, similar to a halo effect, where parents perceive lower levels of these factors when they experience higher levels of cumulative risk within the family. Alternatively, it may imply that cumulative risk experienced by the family is more likely to have a negative impact on factors occurring *within* the immediate home environment, than on factors occurring in more distal environments, such as preschool (Masten et al., 1999).

Importantly, good quality teacher-child relationships were able to act as compensatory resources, by directly promoting children's educational resilience when their parent-child relationship quality was low. These results support the premise within resilience research that relationships with adults outside the home can play a compensatory role, with only one supportive relationship with an adult needed to buffer against risk. As this community sample was characterised by generally high quality relationships, it is possible that stronger compensatory effects would be seen for other children in the wider community with a particularly poor quality relationship. Several studies have also demonstrated similar compensatory effects for young children's mental health, engagement and achievement (Brody et al., 2002; Burchinal et al., 2002; Furrer & Skinner, 2003; O'Connor & McCartney, 2007), and also for low-income adolescents' perceived

competence (Murray, 2009). However, a number of other studies have failed to find such compensatory effects among children in the early school years (J. N. Hughes, Cavell, & Jackson, 1999; Meehan, Hughes, & Cavell, 2003; Mitchell-Copeland, Denham, & DeMulder, 1997; Pianta, Nimetz, & Bennett, 1997; Silver, Measelle, Armstrong, & Essex, 2005). It is likely that methodological issues may account for this discrepancy between studies. Numerous factors differed between studies, including sample age and size, the aspect of relationship quality studied and who these data were obtained from (i.e., parents, children, observers), and the specific developmental outcome studied. Additionally, many of these studies relied on significant interaction terms within multiple regressions, which (a) can be hard to detect when sample sizes are small, or a number of covariates are included in regressions, and (b) when found, can be hard to replicate in other studies. Although these methodological problems may explain the contradictory findings, they are unable to determine whether true compensatory effects exist.

In sum, these findings highlight the importance of good relationships for promoting self-concept, mental health, and classroom engagement among all children. Children exposed to adversity may receive as much benefit as their more fortunate peers, if not more, from early intervention programs designed to promote these variables. However, as these analyses studied associations between variables, rather than examining resilient children as a distinct subgroup, it is not known exactly what levels of these preschool variables are needed for children to be considered as resilient. Consequently, the following chapter examines resilience using a person-centred approach, to identify more distinct patterns of adaptation among the children. Together, these final two results chapters will provide a fuller understanding of the process of resilience in relation to early classroom engagement.

9

PROFILES OF ADAPTATION: A PERSON-CENTRED APPROACH TO EDUCATIONAL RESILIENCE

9.1 Introduction

This chapter aimed to identify characteristics of resilient children. Levels of parent-child and teacher-child relationship quality, and children's self-concept and mental health problems in preschool were examined in relation to children's resilient functioning in reception. Potential pathways by which these variables might predict resilient functioning were also examined, using the Resilience Process Model from chapter 8.

Analyses in this chapter used a person-centred approach (see Bergman & Magnusson, 1997; Masten et al., 2009, see also section 2.4.4.2). In person-centred analyses, a group of resilient children is actually identified based on their combination of high risk and high engagement, and these children's levels of hypothesised protective/promotive factors are compared with other groups of children (as discussed in section 2.4.4.2). This approach was used to build upon the variable-centred resilience analyses of the previous chapter, where resilience was inferred from the associations between risk, engagement, and protective/promotive factor variables. Many resilience researchers consider that using these two approaches in combination provide complementary information, and the opportunity for verifying results (e.g., Luthar & Cushing, 1999; Masten et al., 1999). It is important to note, however, that these two types of analyses are not fundamentally distinct.

For this purpose, four groups of children were identified, based on their combined levels of both cumulative risk and classroom engagement (see Figure 9.1). The group of children who experienced high risk but showed high engagement was labelled Resilient. The remaining groups were labelled Vulnerable (high risk/low engagement), Competent (low risk/high engagement), and Under-achieving (low risk/low engagement).

Three main comparisons were made between these groups regarding their levels of relationship quality, self-concept and mental health problems. First, Resilient and

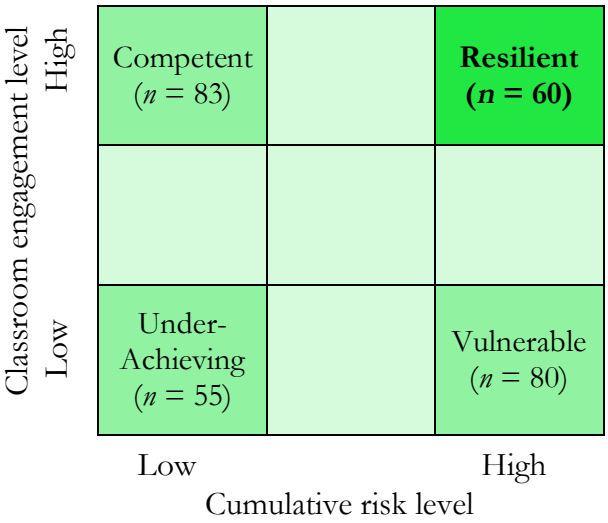


Figure 9.1. Identifying four groups of children based on the Full Diagnostic Model of resilience (see Masten et al., 2009). Blank categories reflect intermediate scores on risk, engagement, or both.

Vulnerable children were compared. This comparison addressed the question of whether under conditions of high risk, levels of the preschool hypothesised protective/promotive factors were associated with different engagement outcomes. Second, Competent and Under-achieving children were compared. Differences between these two groups could be compared to differences found between Resilient and Vulnerable groups, to determine if the effects of these variables are specific to the process of coping with risk, or if they influence engagement regardless of risk level. Third, the Resilient and Competent children were compared. This addresses whether children experiencing high risk need higher levels of a variable than children experiencing low risk to achieve the same high level of engagement.

9.1.1 Hypotheses.

- Children in the Resilient group would show significantly higher levels of parent-child and teacher-child relationship quality and self-concept, and significantly lower levels of mental health problems than children in the Vulnerable group.

- Children in the Resilient group would not significantly differ from children in the Competent group on their levels of parent-child and teacher-child relationship quality, self-concept, and mental health problems.

- Among high-risk children, the association between the quality of the children's relationships with key adults (parents and teachers) in preschool and their resilient/vulnerable group status in reception will be mediated by their levels of self-concept and mental health problems in preschool.

Given the mixed findings in the literature regarding variables acting as protective or promotive, no hypotheses were made about whether differences between Resilient and Vulnerable children would also be seen between Competent and Under-achieving children.

These hypotheses are similar to those in chapter 8. This is because they are designed to provide complementary information, and verify the results of chapter 8, using different statistical analyses.

9.2 Formation of the Adaptation Groups

Children were classified into four 'adaptation' groups, based on combinations of their cumulative risk (low vs. high) and classroom engagement (low vs. high) scores. These groups represented four distinct profiles of adaptation, based on the Full Diagnostic Model of resilience (Masten et al., 2009, see also Figure 9.1) used in other person-centred studies (e.g., Luthar, 1991; Luthar et al., 1993; Masten et al., 1999; Schoon, 2006). Cumulative risk was measured using the summed index of the 10 standardised risk factors (the 'standardised sum' cumulative risk variable created and discussed in see section 3.2.1.4).[25]

Children were assigned to the four groups through a two-step process. First, scores on the risk and engagement variables were divided into thirds (as used in other person-

[25] This conceptualisation of risk differed slightly from that used in chapter 8, where the 10 individual risk factors were examined simultaneously. One continuous score was desired here to simplify the creation of groups by using a single 'risk' cut-point. These two risk conceptualisations were quite similar, as they explained a similar percentage of variance in engagement, and their resulting resilience scores correlated almost perfectly (see Section 8.3.2).

centred resilience investigations, e.g., Luthar et al., 1993). The advantage of such an approach is that it balances the dual needs of (1) retaining an adequate sample size for each group (compared with quartiles, for example), and (2) ensuring the 'low' and 'high' groups are distinct (which, arguably, cannot be achieved through a median split).[26] As a result, low risk was defined as scores of ≤ -2.73 (corresponding to the lowest 33.3% of scores), and high risk was defined as scores of ≥ +1.31 (corresponding to the top 33.5% of scores) on the cumulative risk variable. Low engagement was defined as scores of ≤ 34.92 (corresponding to the lowest 30.5% of scores), and high engagement was defined as scores of ≥ 39.24 (which corresponded to the highest 34.9% of scores) on the classroom engagement variable. Only comparisons of groups showing extreme functioning were planned, to determine if predictor variables showed different effects in low- versus high-risk conditions (see Masten et al., 1999; Schoon, 2006). For this reason, children scoring in the middle third on either or both variable/s were not considered relevant to this investigation, and were not retained in further analyses. This reduced the sample to 278 children.

Second, the remaining children were classified into four groups based on their combinations of scores on the risk and engagement variables. These groups are represented graphically in Figure 9.2, and distributions of children on these two variables are shown in Table 9.1. A chi-square test for independence indicated that engagement was not evenly distributed across the risk groups, with a χ^2 (4) of 10.41 ($p < .05$). Specifically, 44% of the children scoring in the low risk group showed high engagement, and were classed as Competent. However, only 32% of children scoring in the high risk group also showed high levels of engagement, and could be classed as Resilient. A *z*-test of two proportions showed the difference between these two percentages was significant, $z = 2.46$, $p < .01$, confirming that children experiencing high levels of risk are significantly less likely to show high levels of engagement compared with their low-risk counterparts. This

[26] In supplemental analyses, more stringent quartile cut-points were used to create groups. Cut-offs with even greater stringency were not tested as the number of children in each group became very small, reducing statistical power. Although sample sized reduced considerably when using quartile cut-offs (n = 158), the resulting multivariate findings were very similar to those reported for groups based on tertile cut-off scores. The similarity of results supported the use of tertile cut-offs as indicators of extreme functioning.

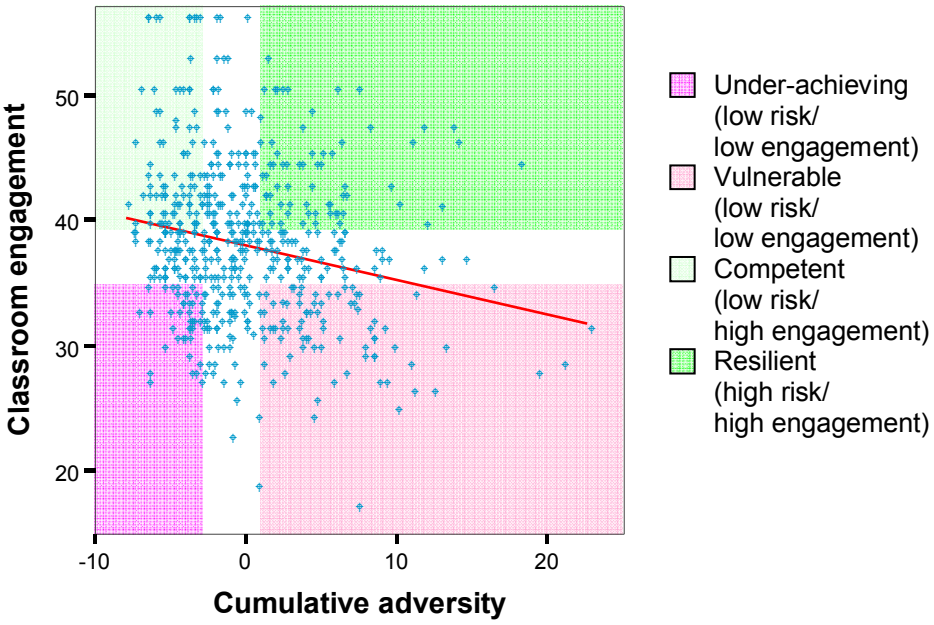


Figure 9.2. The classification of children (n = 568) into four adaptation groups based on top and bottom thirds of cumulative risk and classroom engagement variable distributions. The regression line is provided in red.

operational definition of resilience is consistent with the definition within the literature, where resilience involves 'un-expected positive adaptation', or 'beating the odds' in circumstances where risk is associated with a higher probability of poorer outcomes (e.g., Fergusson & Lynskey, 1996).

A series of planned comparisons within MANOVA was conducted on risk and engagement scores to ensure the creation of groups had worked as intended (see Table 9.2). Specifically, an examination of the four groups revealed that Resilient and Competent children did not differ on their levels of engagement, and Resilient and Vulnerable children did not differ on their levels of risk. These planned comparisons validated the cut-off method for creating groups

Scores on each of the 10 separate risks comprising the cumulative risk variable are detailed for the high-risk children (the Resilient and Vulnerable groups combined) in Table 9.3. These children had experienced multiple risks, well above that experienced by the total thesis sample (see Table 4.2). They were living in families characterised by high rates of parental distress and single parent status, and low educational qualifications. Most

Table 9.1
Engagement Group as a Function of Risk Group

Risk group (and equivalent score range)	Engagement group (and equivalent score range) Lowest third (≤ 34.92)	Middle third	Highest third (≥ 39.24)
Lowest third (*n* = 189) (≤ -2.73)	**29.4**	26.2	**44.4**
Middle third (*n* = 188)	34.0	21.8	44.1
Highest third (*n* = 191) (≥ +1.31)	**42.1**	26.3	**31.6**

Note. Rows add up to 100%. Proportions of children within the four adaptation groups are in boldface.

children's families were receiving a government-funded pension or benefit, and one in two children had experienced at least two stressful life events within the family in the past year.

9.3 Preliminary Analyses

The results from preliminary analyses conducted to assess preconditions of multivariate analyses are reported in Appendix D. In sum, these results showed that assumptions were largely met, suggesting that it was reasonable to proceed with the main statistical analyses.

9.4 Statistical Analyses

Statistical analyses within this chapter addressed three main questions: (1) what combination of the predictor variables (relationship quality, self-concept and mental health problems, as reported by parents and teachers) best predicts Resilient group membership? (2) exactly which groups do predictor variables discriminate between? And (3) does the level of relationship quality predict Resilient functioning through its influence on children's self-concept and mental health problems?

Discriminant Function Analysis (DFA) was considered theoretically the most appropriate method for addressing the first question, as it examines which linear combination of continuous independent variables distinguishes between the four groups of children. However, DFA was not a suitable option for investigating the second

Table 9.2
Mean Scores (and Standard Deviations) on Defining Criteria (Risk and Engagement Variables) for the Four Adaptation Groups

	1. Resilient (high risk high eng) (n = 60)	2. Vulnerable (high risk low eng) (n = 80)	3. Competent (low risk high eng) (n = 83)	4. Under-achieving (low risk low eng) (n = 55)	Planned comparisons
Risk score	5.08 (3.64)	6.27 (4.27)	-4.68 (1.28)	-4.21 (1.13)	1 = 2 3 = 4
Engagement score	43.45 (3.43)	30.84 (3.26)	44.23 (5.04)	32.08 (2.42)	1 = 3 2 = 4

Note. Numbers within the planned comparisons column refer to adaptation group number. Planned comparisons adopted a p of < 05 using Holm's step-down procedure. eng = engagement.

question, as post-hoc testing is required, which is not provided for DFA by SPSS. MANOVA, however, addresses the theoretical inverse of DFA, examining whether group membership predicts scores on continuous variables, and provides post-hoc testing options within SPSS. Consequently, MANOVA was used to (1) verify the DFA results, and (2) provide more detail on exactly which groups differed significantly on the predictor variables. Post-hoc tests used Holm's step-down procedure (Holm, 1979) to adjust for the number of tests conducted, thereby reducing the probability of a Type I error. When the assumption of homogeneity of variances was violated, the non-parametric Kruskal-Wallis (for between-groups effects) and Mann-Whitney Test (for post-hoc comparisons) were used to analyse group differences for those dependent variables. SPSS cannot adjust for covariates in DFA. And as DFA and MANOVA analyses were effectively paired in order to address the same question, covariates were also not adjusted for in MANOVA, even though it could technically be done.[27]

To answer the third question, path analysis using linear regression (both binary logistic and continuous) was used to examine the pathways by which relationship quality, self-concept and mental health problems could predict resilient (compared with vulnerable) functioning. This analysis focussed on the two groups of high-risk children

[27] The results did not differ appreciably when covariates were included within MANOVA in subsidiary analyses.

Table 9.3
The Prevalence of Risk Factors Experienced by the High-Risk (Resilient and Vulnerable) Children

Risk variable	% (n = 140)
Family receiving government pension/benefit	82.6
≥ 1 parent had not achieved at least a high school education	68.7
Primary caregiver clinically distressed	57.1
Family experienced ≥ 2 stressful life events in the past year	50.0
Child living in a single parent family	42.9
Neither parent employed	30.2
Born to ≥ 1 adolescent parent	23.8

with divergent outcomes, the Resilient and the Vulnerable, and excluded the low-risk Competent and Under-Achieving children. Binary logistic regression was used for the first equation, predicting membership in the Resilient group (with the Vulnerable group coded 0, as the reference category) from mental health problems, self-concept, and relationship quality. Then, two hierarchical multiple linear regressions were used for the second and third equations, predicting the continuous independent variables theoretically prior to Resilient group status in the model (i.e., mental health problems, and then self-concept). All continuous predictor variables were standardised, to combine results from logistic and linear regression analyses in the same path model. In doing this, *B* reported in SPSS output is made equivalent to Beta (β). As these regressions tested the same path model used in chapter 8, adjustments were made for the same three covariates as in chapter 8 (number of terms at school, school type (public/private), and gender). Keeping these covariates consistent between analyses allowed for closer comparison of results. Together, the results from these two chapters provide complementary information on the processes of educational resilience, and examine the validity of resilience as a construct. Consistent with chapter 8, path analyses were conducted separately for preschool predictor variables reported by parents and teachers.

Table 9.4
Mean Levels (and Standard Deviations) of Hypothesised Protective/Promotive Factor Scores for the Four Adaptation Groups

Variable	Resilient (high risk high eng) (n = 60)	Vulnerable (high risk low eng) (n = 80)	Competent (low risk high eng) (n = 83)	Under-achieving (low risk low eng) (n = 55)
Parent-child relationship (p)	65.72 (7.23)	64.32 (6.77)	64.75 (6.66)	65.54 (6.50)
Self-concept (p)	0.37 (0.82)$_{a,b}$	-0.30 (0.99)$_{a}$	-0.05 (0.84)$_{b}$	0.04 (0.85)
Mental health problems (p)	7.83 (3.94)$_{a}$	10.48 (5.02)$_{a,b,c}$	8.37 (5.12)$_{b}$	8.15 (3.96)$_{c}$
Teacher-child relationship (t)[d]	68.47 (6.50)	65.03 (8.96)$_{a}$	70.05 (5.88)$_{a,b}$	64.84 (10.75)$_{b}$
Self-concept (t)	-0.09 (0.88)	-0.49 (1.07)$_{a}$	0.26 (0.80)$_{a,b}$	-0.26 (1.03)$_{b}$
Mental health problems (t)[d]	5.03 (4.43)$_{a}$	8.48 (5.66)$_{a,b}$	3.71 (3.95)$_{b,c}$	7.24 (6.68)$_{c}$

Note. Means in a row with the same subscript differ significantly at $p < 05$ using Holm's step-down procedure. (p) = parent-reported variable; (t) = teacher-reported variable; eng = engagement.
[d]Non-parametric Mann-Whitney Test used for post-hoc comparisons due to unequal variances across groups.

9.5 Results

9.5.1 Descriptive Information for the Adaptation Groups

Mean levels of the six predictor variables for the four adaptation groups are provided in Table 9.4. Additionally, these mean levels are displayed as *z*-scores in Figure 9.3 to enable graphical comparison of group profiles. As expected, the Resilient children were doing better than the Vulnerable children regarding their levels of predictor variables, and their scores generally resembled those of the Competent children. These results will be discussed further in relation to the following analyses.

9.5.2 Prediction of Resilient Functioning

All variables excepting child-parent relationship quality significantly contributed to distinguishing between the groups within discriminant function analysis (*F* values were all significant at $p < .01$, see Table 9.5). Thus, the four adaptation groups could be reliably separated using some combination of these remaining five variables. With four dependent groups, three discriminant functions could be calculated. The first two of these functions

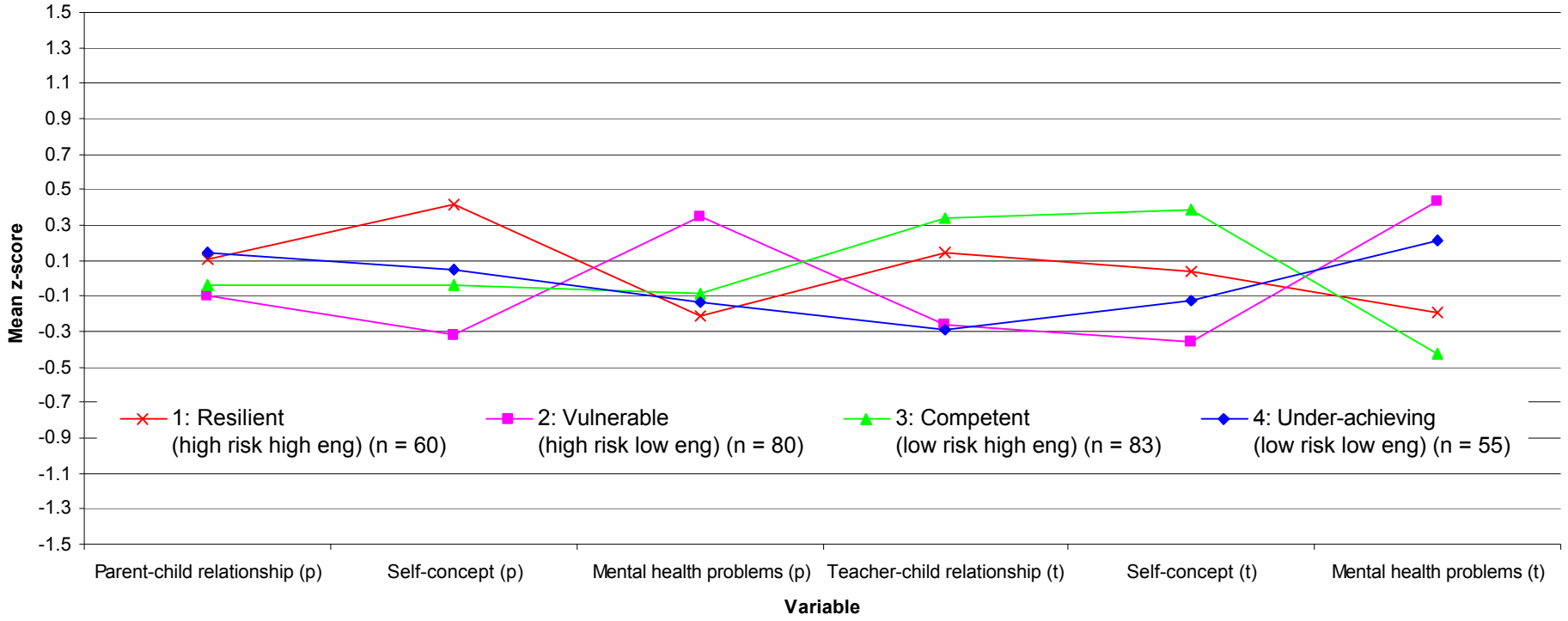


Figure 9.3. Mean levels of hypothesised protective/promotive factors (as *z*-scores) for the four adaptation groups (n = 278). (p) = parent-reported variable; (t) = teacher-reported variable; eng = engagement.

Table 9.5
Univariate Statistics, Standardised Coefficients and Structure Coefficients for the Hypothesised Protective/Promotive Factors from the Discriminant Function Analysis (n = 278)

	Univariate statistics		Standardised coefficients		Structure matrix	
Variable	Wilks' Lambda	*F* (3, 274)	Function 1	Function 2	Function 1	Function 2
Parent-child relationship (p)	.99	0.64	.19	-.10	-.09	.26
Self-concept (p)	.93	6.64***	-.18	1.03	-.42	.83
Mental health problems (p)	.95	4.93**	.27	.08	.46	-.37
Teacher-child relationship (t)	.93	7.41***	-.21	.06	-.67	-.22
Self-concept (t)	.91	9.04***	-.06	-.61	-.74	-.37
Mental health problems (t)	.87	13.17***	.69	-.02	.93	.19

Note. (p) = parent-reported variable; (t) = teacher-reported variable.
**$p < .01$. ***$p < .001$.

discriminated significantly between groups, seen in their χ^2 values (Table 9.6). Together, these two functions accounted for 90.3% of between-group variance (Table 9.6).

Function 1 could be termed a 'psychosocial difficulties' function, given that mental health problems (teacher-reported) showed the strongest loading on it by far, which was large and positive, and self-concept (teacher-reported) showed the next strongest loading, being large and negative (see the structure matrix in Table 9.5). Both parent-reported mental health problems and self-concept also showed similar although smaller effects. The highest loadings were for the teacher-reported variables, suggested that these psychosocial issues were perceived more strongly by teachers and within the school context. The combined-groups plot (Figure 9.4) illustrates how groups are spaced along the two significant discriminant functions according to their centroids (or function means) (see also Table E14 in Appendix E for the exact values of these centroids). Upon visual inspection of the plot, it was seen the Vulnerable group showed the highest centroid score on this function, representing the highest level of psychosocial difficulties. In particular, these children showed the highest level of mental health problems (in the upper end of the 'normal' range) and the lowest levels of self-concept (for both parent- and teacher-

Table 9.6
Summary of Canonical Discriminant Functions (n = 278)

Function	Eigenvalue	% variance	Canonical correlation	Wilks' Lambda	χ^2	*df*
1	.16	65.1	.37	.79	64.21***	18
2	.06	25.2	.24	.92	23.14**	10
3	.02	9.6	.15	.98	6.48	4

*$p < .05$. **$p < .01$. ***$p < .001$.

reported variables). Furthermore, Function 1 separated the two high engagement groups (Resilient and Competent) from the two low engagement groups (Vulnerable and Under-achieving), and there did not appear to be any significant differences between similarly-engaged groups. In other words, regardless of their level of risk, children in high engagement groups had experienced greater self-concept and mental health levels (reported by both parents and teachers), and teacher-child relationship quality than children in low-engagement groups (see also Table 9.4). This would suggest a main effect: these variables promote high engagement regardless of the level of risk experienced.

Function 2 was predominantly characterised by parent-reported self-concept, which was the only variable to load strongly on it (see the structure matrix in Table 9.5). Upon examining the combined-groups plot (Figure 9.4), it was less clear how this function differentiated between groups. It seemed that Function 2 differentiated the Resilient children from the other groups, but particularly from the (1) Vulnerable and (2) Competent children. The Resilient children had significantly higher levels of self-concept than both the Vulnerable and the Competent children (see also Table 9.4). This suggests that in conditions of high risk, higher levels of self-concept can distinguish highly engaged children (the Resilient group) from their lesser-engaged counterparts (the Vulnerable group). Furthermore, to become highly engaged at school, Resilient children (who experience high levels of risk) need higher levels of parent-reported self-concept than their low-risk peers (the Competent children). Self-concept differences between the two groups of low-risk children (the Competent and Under-achieving groups) did not appear sizeable.

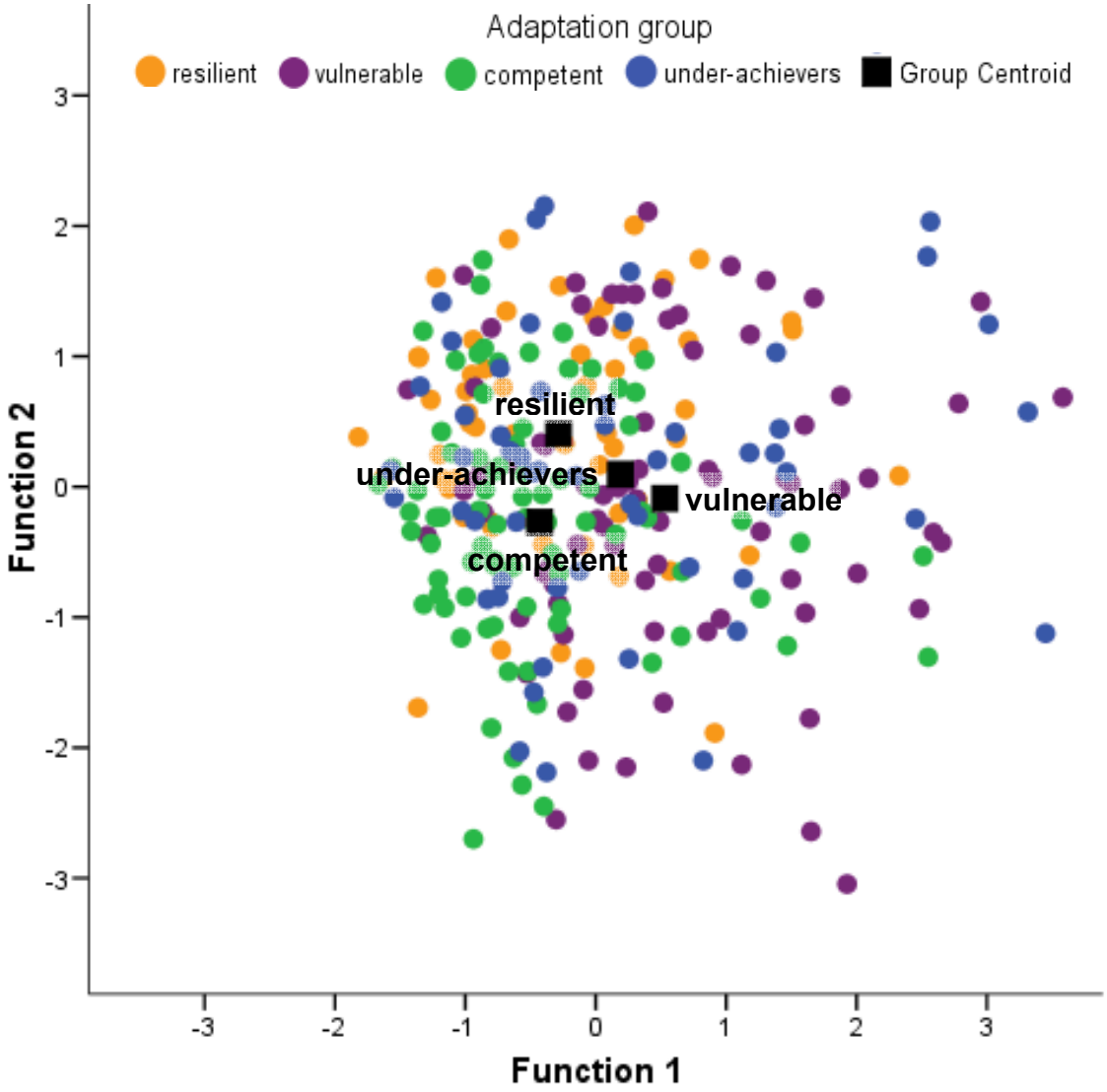


Figure 9.4. The combined-groups centroid plot from discriminant function analysis (*n* = 278).

This would suggest the presence of an interaction effect, where self-concept levels only promoted engagement under conditions of high risk.

Table 9.7 shows the group classification results. Overall, 41.4% of the sample was correctly classified into the four adaptation groups using the two functions, as compared to an expected classification rate of 25% occurring by chance alone. This relatively low rate somewhat misrepresents the value of these variables in predicting resilience, given they were not expected to differentiate between the Resilient and Competent children. This was confirmed by the fact that, when children in these two high-engagement groups

Table 9.7
Classification Results from the DFA for the Four Adaptation Groups

Actual group membership	Predicted group membership			
	Resilient	Vulnerable	Competent	Under-achieving
Resilient (n = 60)	**48.3**	13.3	25.0	13.3
Vulnerable (n = 80)	20.0	**42.5**	23.8	13.8
Competent (n = 83)	21.7	13.3	**51.8**	13.3
Under-achieving (n = 55)	29.1	25.5	29.1	**16.4**

Note. Overall percentage of correctly classified cases = 41.4%. Correct group classifications in boldface.

were misclassified (which occurred for approximately one in two children), they were generally classified as belonging to the other high engagement group (but as having the wrong level of risk). Additionally, the Under-achieving group was quite poorly classified by these functions. Children from this group were just as likely to be classified as belonging to another of the adaptation groups as their actual group. These classification analyses were repeated excluding the two low-risk groups (the Competent and Under-achieving groups), to determine how well the predictor variables differentiated the Resilient and the Vulnerable children, who differed the most in their levels of predictor variables. This also allowed closer comparison with previous research, where an Under-achieving group is rarely included in analyses. The two significant functions were essentially replicated, and classification of these Resilient and Vulnerable groups improved, with a total of 69.3% of cases correctly classified (compared with 50% correctly classified by chance alone) (see Table 9.8).

9.5.3 Resilient Functioning as Predicting levels of Preschool Variables

Overall, MANOVA results corroborated the overall pattern of the DFA results. There was a statistically significant difference between the four adaptation groups on the combined dependent variables (Wilks' $\lambda = .79$, $F\,(18) = 3.68$, $p < .001$). This was a medium effect size (partial $\eta^2 = .08$) (Cohen, 1988; Sink & Stroh, 2006). Univariate

Table 9.8
Classification Results from the DFA for the Resilient and Vulnerable Groups

Actual group membership	Predicted group membership	
	Resilient	Vulnerable
Resilient (n = 60)	**75.0**	25.0
Vulnerable (n = 80)	35.0	**65.0**

Note. Overall percentage of correctly classified cases = 69.3%. Correct group classifications in boldface.

between-subjects tests adjusted using Holm's step-down procedure (Holm, 1979) revealed that adaptation group was significantly associated with self-concept and mental health problems as reported by teachers and parents, and teacher-child relationship quality (see F values in Table 9.9). In other words, the only dependent variable not significantly related to resilience group was parent-child relationship quality. Teacher-reported mental health problems showed a large effect size, whereas all other significant variables showed medium effect sizes (see partial η^2 values in Table 9.9).

Post-hoc comparisons were conducted to determine exactly which groups differed on each of the significant dependent variables (as previously shown in Table 9.4). Overall, the Resilient children more closely resembled the Competent children than the Vulnerable children in terms of their levels of predictor variables. Greater detail of post-hoc analyses are now provided for each variable separately, given the slight variation in results. Resilient children will be compared with (1) Competent and (2) Vulnerable children. Additionally, Competent children are compared with Under-achieving children. These results can then be contrasted against the Resilient-Vulnerable comparison. Finally, comparisons between Under-achieving and (1) Vulnerable and (2) Competent children examine why the Under-achieving group experiences low engagement despite experiencing only low levels of risk.

9.5.3.1 Teacher-child relationship quality.

Resilient children showed similar levels of teacher-child relationship quality to the Competent children. Both groups showed higher relationship quality levels than the Vulnerable children; however this difference was not significant for the Resilient group.

Table 9.9
Multivariate Analysis of Variance Between-Subjects Effects for the Hypothesised Protective/Promotive Factors (n = 278)

Variable	*F* (*df* = 3)	Partial η^2
Parent-child relationship (p)	0.64	.01
Self-concept (p)	6.64***	.07
Mental health problems (p)	4.93**	.05
Teacher-child relationship (t)	20.96***[a]	.08
Self-concept (t)	9.04***	.09
Mental health problems[a] (t)	37.45***	.13

Note. Significance levels corrected using Holm's step-down procedure. (p) = parent-reported variable; (t) = teacher-reported variable.
[a]Analysed using the non-parametric Kruskal-Wallis Test, due to unequal variances across groups; in these cases, a χ^2 value is reported instead of an *F* value.
**$p < .01$. ***$p < .001$.

The Under-achieving children's scores were similar to those of the Vulnerable children, and were lower, but not significantly different from those of the Resilient children (Table 9.4). A main effect was detected from the overall pattern of group scores - regardless of the level of risk children had experienced, a higher level of teacher-child relationship quality was associated with experiencing high engagement. Conversely, lower levels were also associated with experiencing low engagement, suggesting this was a 'bipolar' factor - conferring either protection or vulnerability, depending on degree (Masten, 2001).

9.5.3.2 Teacher-reported self-concept.

Resilient children experienced similar levels of self-concept as the Competent children. Although both groups showed higher self-concept levels than Vulnerable children, the Resilient group's levels were not significantly higher. The Under-achieving group experienced similar self-concept levels to the Vulnerable group, and significantly lower levels than the Competent group (Table 9.4). Overall, a main effect was detected: at both

levels of risk, higher self-concept was associated with membership in a high engagement group, suggesting this was also a 'bipolar' factor.

9.5.3.3 Teacher-reported mental health problems.

Resilient children's teacher-reported mental health problems most closely resembled those of the Competent children, both of whom showed significantly lower levels of problems than the Vulnerable children. The Under-achieving group showed similar mental health problems levels to the Vulnerable group, and significantly higher levels than the Competent group (Table 9.4). Overall, a main effect was detected; regardless of the level of risk children had experienced, a lower level of mental health problems was associated with experiencing high engagement, and a higher level of problems was associated with experiencing low engagement, suggesting this was also a 'bipolar' factor.

9.5.3.4 Parent-reported self-concept.

Resilient children showed significantly higher levels of self-concept than Competent children, which was of a medium effect size (Cohen's d = -0.5). In other words, to show high engagement, high-risk children need higher levels of self-concept than low-risk children. Additionally, Resilient children showed significantly higher levels of self-concept than Vulnerable children. The Under-achieving group's self-concept levels did not significantly differ from any group. They were most closely aligned with the Competent children, and in-between the Resilient and Vulnerable children (Table 9.4). Overall, an interaction effect was apparent: at low levels of risk, self-concept did not differentiate between high (Competent) and low engagement (Under-achieving) groups, but at high risk, significantly higher self-concept levels distinguished the high engagement (Resilient) from the low engagement (Vulnerable) group. This effect is shown visually in Figure 9.5 (Panel A).

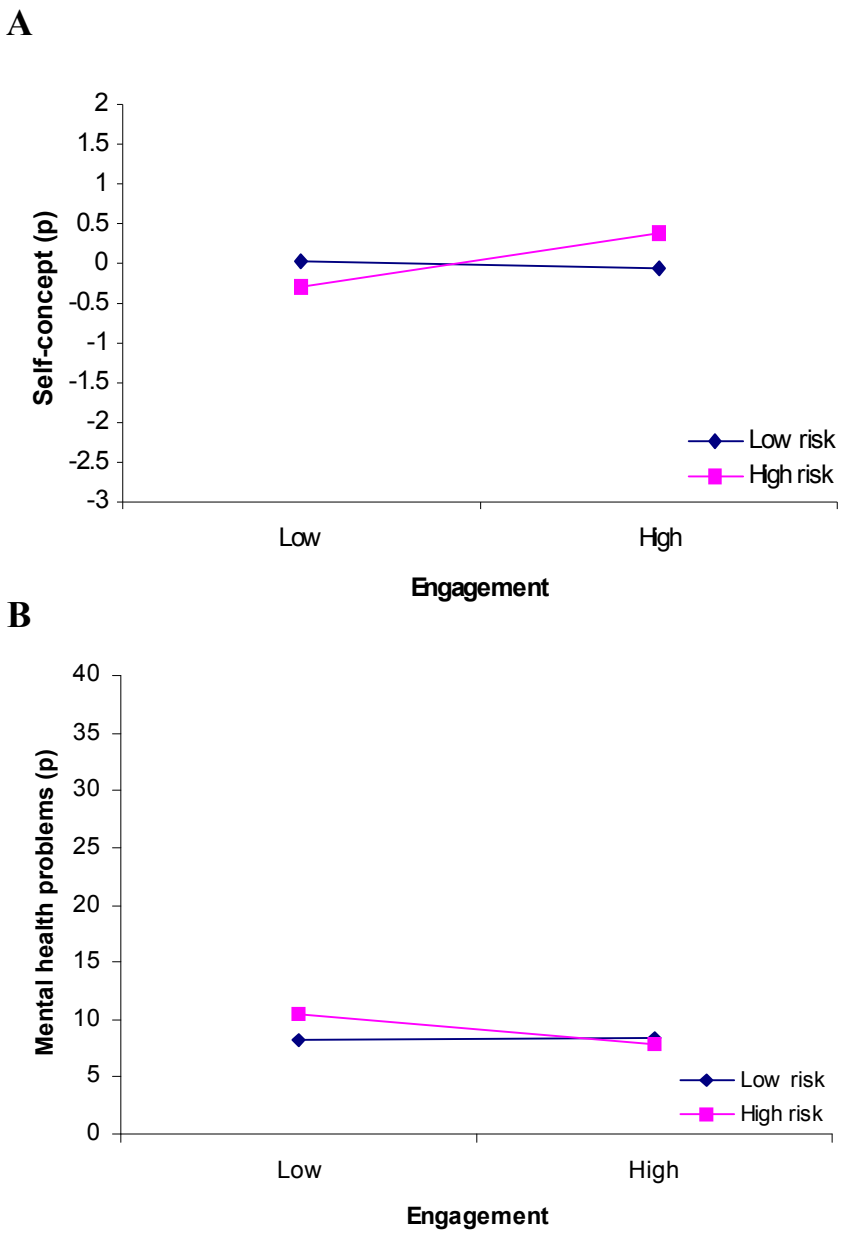


Figure 9.5. The association between protective factors and engagement group as a function of risk group (n = 278). The variable in Panel A is parent-reported self-concept, and the variable in Panel B is parent-reported mental health problems.

9.5.3.5 Parent-reported mental health problems.

Resilient children showed similar levels of mental health problems as the Competent children, both of whom showed significantly lower levels than the Vulnerable children. The Under-achieving group had similar levels of mental health problems to the Competent group, but significantly lower levels than the Vulnerable group (Table 9.4). Overall, these results resembled an interaction effect: levels of mental health problems

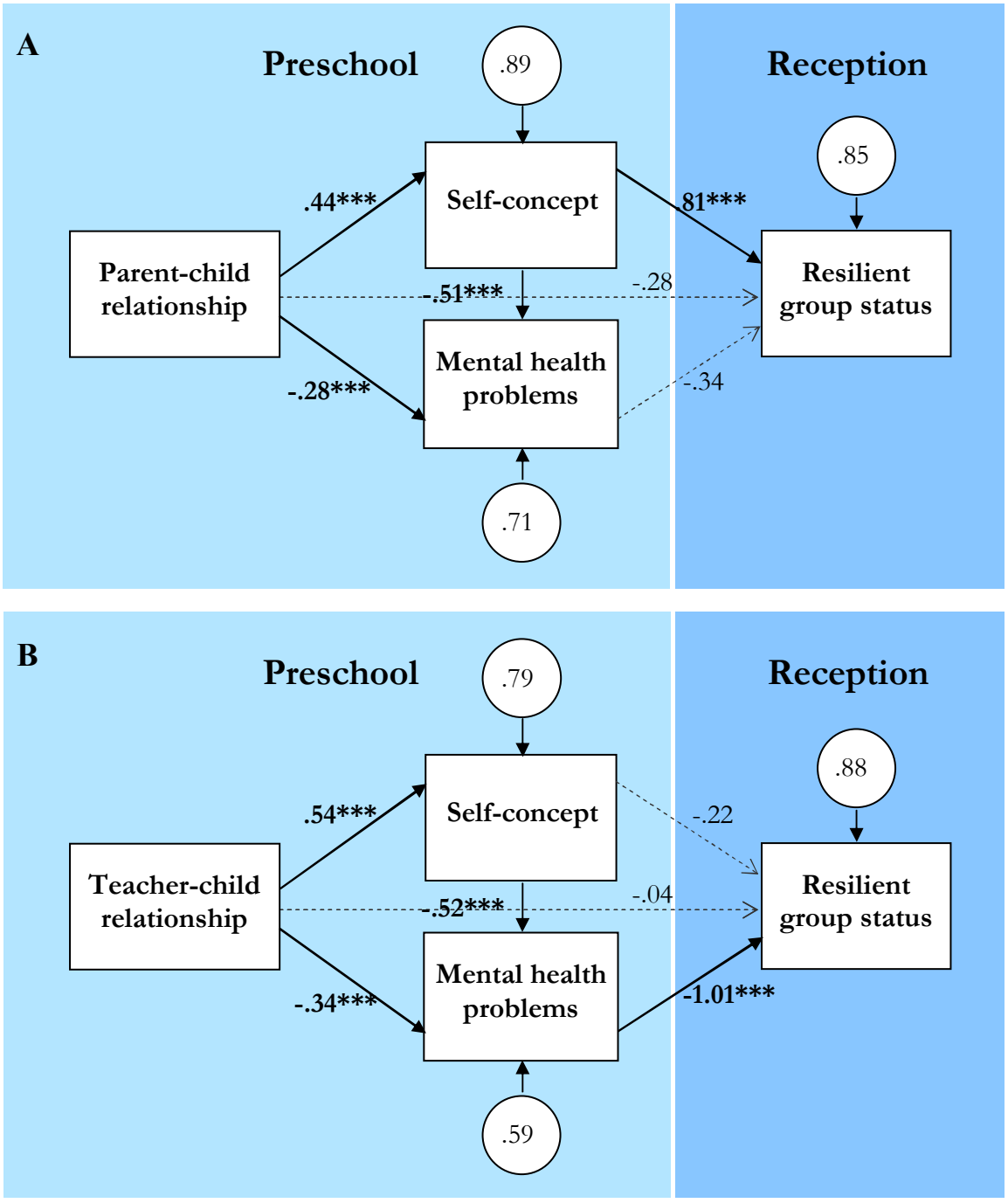


Figure 9.6. Longitudinal path model predicting resilient group status (with Resilient coded as 1) among high-risk children (n = 140). Panel A contains the continuous *parent-reported* preschool variables (i.e., relationship, self-concept and mental health problems). Panel B contains the continuous *teacher-reported* preschool variables. *B*s for standardised predictor variables (equivalent to Betas) are reported for both continuous and logistic regression equations, as Betas are not available in SPSS logistic regression. Non-significant paths are represented by dashed lines. Residual error terms (or 'disturbance terms') are calculated as the square root of 1 - R^2, and are displayed in circles. Covariates are adjusted for in each equation, but are not displayed graphically.
***p < .001.

only distinguished between low- and high-engagement groups at high (and not low) levels of risk. This effect is displayed visually in Figure 9.5 (Panel B).

9.5.4 Processes related to Resilient Functioning among Children in High-Risk Groups

Pathways within logistic and linear regressions are combined graphically using path models in Figure 9.6, and can be compared to the resilience process model for high-risk children in variable-centred analyses (section 8.5.4.2.2). Additional information from the regression analyses is presented in Tables E15 and E16 in Appendix E.

In logistic regressions, a test of the full model against a covariate-only model was significant for both path models (examining parent- and teacher-reported predictors separately) (see Step 2 χ^2 values in Table E15 in Appendix E). This indicates that the predictors as a set distinguished between Resilient and Vulnerable children, even after adjusting for the covariates. Results within Figure 9.6 (see also Table E15 in Appendix E) indicate that when other variables were adjusted for, only self-concept uniquely predicted Resilient group status in the path model using parent-reported predictors. Children scoring 1 *SD* higher on the self-concept variable were 2.25 times more likely as a lower scoring person to be classified as Resilient. However, when using teacher-reported predictor variables, mental health problems was the only variable to significantly predict Resilient group status. For the teacher model, children scoring 1 *SD* higher on the mental health problems variable were only 37% as likely as a lower scoring person to be classified as Resilient.

Results from multiple regressions were very similar for both models (using parent- and teacher-reported predictors). After taking covariates into account, both relationship quality and children's self-concept had direct negative effects on children's levels of mental health problems, although self-concept had the larger effect (see *B*s in Figure 9.6). Additionally, relationship quality had a direct medium and positive effect on children's self-concept levels (Figure 9.6). These effects were slightly larger in the teacher-reported model than in the parent-reported model (also see additional information in Table E16 in Appendix E). Broadly, these path model results are consistent with the variable-centred

logistic regressions predicting resilience (vs. vulnerability)[28] for high-risk children in chapter 8 (n = 179, see Figure 8.6). This would suggest that process model results are quite robust, regardless of (a) how resilience is operationally defined, or (b) of the sample used.

9.6 Summary

These results painted a consistent picture of the preschool factors present among children with differing profiles of adaptation. The Resilient group of children were characterised by slightly above-average levels of parent-child and teacher-child relationship quality, and self-concept, and slightly lower-than-average levels of mental health problems. The Resilient children differed from the Vulnerable children (who experienced lower levels of engagement) on their levels of five preschool variables: teacher-child relationship quality, and parent- and teacher-reported self-concept and mental health problems. These findings are consistent with other research (Cicchetti & Rogosch, 1997; Dumont & Provost, 1999; Fergusson & Lynskey, 1996; Hamill, 2003; Herman-Stahl & Petersen, 1996; Leontopoulou, 2006; Luster, Bates, Fitzgerald, Vandenbelt, & Key, 2000; Masten et al., 1999; Parker, Cowen, Work, & Wyman, 1990; Thomas, 2007; Werner & Smith, 1992; Wyman, Cowen, Work, & Parker, 1991). Additionally, the Resilient children were similar to the Competent children (who had lower levels of risk) on four of these five variables: teacher-child relationship quality, teacher-reported self-concept, and parent- and teacher-reported mental health problems. Studies that include such low-risk groups generally find that Resilient children more closely resemble Competent than Vulnerable children (Hamill, 2003; Herman, Lambert, Reinke, & Ialongo, 2008; Masten et al., 1999; Masten & Obradović, 2006; Thomas, 2007). This finding also highlights the 'self-righting tendencies' within human development (Masten, 2001; Masten & Coatsworth, 1998; Werner & Smith, 1992), where even in the presence of risk, children may still achieve good outcomes if certain basic resources are available. However, without such supports, high risk children are less likely to show good school adjustment outcomes in reception.

[28] based on cut-points in residual scores

In contrast, Resilient children had significantly higher levels of parent-reported self-concept than their Competent peers. This suggests that greater self-concept levels were needed to counteract the deleterious effects of risk, consistent with a 'compensatory' resilience model (Masten et al., 1988). Other studies that have included self-concept variables found no self-concept differences between Resilient and Competent children (Hamill, 2003; Herman-Stahl & Petersen, 1996; Masten et al., 1999; Thomas, 2007). In contrast, Dumont and Provost (1999) found that Competent adolescents had higher levels of self-esteem than Resilient adolescents. All of these studies assessed older children, with most attending middle or high school. Additionally, competence was mostly defined in terms of mental health, or across multiple domains. Protective factors may thus work slightly differently at different ages, and for different areas of competence. However, Resilient university students have been found to have a more internal locus of control than Competent students (Leontopoulou, 2006). Nonetheless, these findings all suggest the importance of positive self-concept for achieving positive developmental outcomes.

Including two low-risk groups (who differed on engagement) consistent with a Full Diagnostic Model (Masten et al., 2009) made it possible to detect interactions as well as main effects. An especially pertinent issue was whether the predictor variables had similar effects on engagement at both levels of risk. Generally, the pattern of results identified main effects only: high engagement groups had higher levels of predictor variables than low engagement groups. This suggests these variables were more promotive in nature, where they were beneficial for all children regardless of risk status. However, two variables seemed to have more of a protective effect: parent-reported self-concept and (to a lesser extent) mental health problems only distinguished between low- and high-engagement groups at high (and not low) levels of risk. Among high-risk (but not low-risk) children, higher levels of self-concept, and lower levels of mental health problems were associated with a greater likelihood of being resilient (and therefore having high engagement). For mental health problems however, this effect was only apparent within MANOVA, and not DFA, analyses. These factors seemed to exert their beneficial effects only by interacting with and in response to risk, and not when risk was absent. Person-centred studies that

examine four groups generally find main effects (i.e., predictor variables have promotive effects), and not interactions (i.e., predictor variables are protective in nature) (e.g., Herman-Stahl & Petersen, 1996; Thomas, 2007; Zucker et al., 2003).

Simply finding a low-risk low-engagement group in the present sample is noteworthy, as several studies found too few children in this classification group to warrant examination, which is known as the 'empty cell' phenomenon (see Masten et al., 2009; Masten et al., 1999). These researchers are thus unable to examine whether factors that differentiate between Resilient and Vulnerable children are truly protective (conferring greater protection at high risk), or simply promotive (salutary for all children, regardless of risk). However, these studies generally used quite stringent definitions of low risk and/or low competence, making it harder for children to fall into this category. Several studies assessed competence 'across the board', requiring 'low competence' children to score poorly in multiple domains (e.g., Leontopoulou, 2006; Masten et al., 1999). Additionally, risk measures were often quite detailed life events indices containing 30-60 items, making it much more likely for children to score higher on risk with more options to endorse (Dumont & Provost, 1999; Leontopoulou, 2006). It was possible that the current sample (and particularly the Under-achieving group) had experienced more risk than was actually measured. Nonetheless, it seems valid to have found an Under-achieving group in the context of my definition of competence. Classroom engagement could be expected to vary considerably in the first year of school, when children have only just been introduced to a classroom learning environment. At a time characterised by novelty and great change, both low- and high-risk children may experience the process of 'learning to learn' as challenging.

The preschool profile of the Under-achieving group provided insight as to why they showed low classroom engagement despite experiencing little risk. The Under-achieving group was characterised most notably by below-average levels of teacher-reported preschool variables. In this group, children's levels of teacher-child relationship quality, self-concept and mental health problems in the preschool setting were similar to those of the Vulnerable children, and significantly worse than Competent children.

Regardless of risk, having lower levels of these preschool factors had adverse effects. It seems the Under-achieving children lacked the most basic resources needed to deal with the 'normative challenge' of starting school (Masten, 1994). It is important to note that whilst this group scored worse than the others, these levels could not be considered low. Their mental health problems were in the normal range, and they showed reasonably high levels of self-concept and relationship quality. Perhaps during such transitional periods, extremely good (rather than just good) levels of resources are needed to start school with above-average engagement. If this is so, then perhaps all preschool children may experience benefits from interventions designed to improve these factors, regardless of their experience of risk.

The distribution of children across risk and engagement groups illustrates that although many children can be classed as Resilient, they are fighting against the odds. This unexpected pattern of adaptation validates these children's 'Resilient' status, and highlights the need for further study to determine how such children manage to transcend their family circumstances, when many others succumb.

10

DISCUSSION

10.1 Overview

The aim of this thesis was to examine associations between children's relationships with parents and teachers, self-concept and mental health problems in preschool, and their subsequent classroom engagement in the first year of school. This study assessed a community sample of 575 children using a three-year prospective design. The children's parents and teachers reported on these preschool and reception factors. Additionally, for the purposes of subsidiary analyses, engagement was assessed from the children directly in reception, and several academic and behavioural school outcomes were reported by teachers in year 1. The study findings have been discussed in chapters 4 through 9. This chapter summarises the key results, and provides an overview of findings. Then, a more detailed discussion proposes qualifications of these findings, potential opportunities for future research, and implications for the promotion of children's engagement across the transition to school.

10.2 Main Findings

10.2.1 Measurement of engagement in young children.

Results from this study suggest that both cognitive and behavioural indicators of reception children's classroom engagement can be measured validly and reliably using a modified 11-item version of the RAPS engagement scale. This modified scale, termed the RAPS-R, also includes several items often thought to represent emotional engagement (i.e., boredom, enthusiasm). In this way, the scale can be considered as providing a reasonably comprehensive assessment of young children's classroom engagement.

The RAPS-R, which in its original form was designed for children in third grade and above, was also able to assess the cognitive and behavioural engagement levels of children in their first school year. Importantly, most of the cognitive engagement items examined appeared to be appropriate for children in their first year of school. High levels

of cognitive engagement were generally only witnessed among children who were rated as having high levels of behavioural engagement. Even then, several children received the highest possible ratings on all of the cognitive items. So although behavioural and cognitive engagement indicators seem to be tapping the same underlying construct among young children, they may represent different (and perhaps more differentiated) levels of engagement, with the cognitive indicators representing a higher level of engagement. Results suggest that children in their first school year may well show more complex levels of cognitive engagement than they have generally been given credit for within 'early years' questionnaires. Considering this, cognitive engagement items that are generally reserved for older children, such as self-regulation and strategy use, may well also have merit at younger ages.

The construct validity of this newly-developed RAPS-R engagement scale was further demonstrated throughout the rest of the results chapters, as the final RAPS-R scale scores were associated with scores on relationships, self-concept, mental health problems, and school avoidance, progress, disciplinary action, absences and lateness. These variables were reported by both parents and teachers, and spanned the three study waves. Overall, this scale appears to be useful for assessing the engagement of children in their first school year.

In contrast, the emotional engagement of the current sample was too high to be measured accurately by the emotional indicators. And as many of the children were highly emotionally engaged, the scale items were unable to distinguish between them. For these reasons, the emotional engagement subscale was not used any further within this thesis. It is possible that this finding is somewhat a function of the current sample. However, various facets of emotional engagement and school liking have been shown to be high among younger children (Hauser-Cram, Durand, & Warfield, 2007; Ladd et al., 2000; Ramey, Lanzi, Phillips, & Ramey, 1998; Stipek & Ryan, 1997; Valeski & Stipek, 2001). These indicators are used routinely among older children, who are known to have higher levels of apathy and boredom, but cannot be assumed to also work well in young children. Perhaps these emotional engagement differences between age groups are also related to

the developmental differentiation of the engagement construct, which could not be fully explored in this thesis.

The RAPS has been used successfully in older children, and now, the RAPS-R version developed in this thesis can be used with children in their first school year. These findings provide a starting point for the development of one scale that can measure the classroom engagement of children in different school years, though possibly through the development of several slightly differing age-appropriate versions. This is an important research advance, as being able to use one scale with an application spanning a wide age range would enable researchers to compare easily the results of studies in younger and older children. Greater ease of comparison would lead to a more cohesive and integrated evidence base on classroom engagement, including how it develops and changes over the school years. The RAPS is one of the few classroom engagement scales yet to show applicability to children from the first through to the last years of school, and holds great promise for future research on school engagement at all ages.

10.2.2 Mental health problems and engagement.

Results showed that greater preschool mental health problems were significantly associated with subsequently lower levels of classroom engagement in reception. This is the first study to investigate this association longitudinally across the transition to school. This association was found despite these two variables being assessed by different raters, in different contexts, and one year apart, which highlights the role of mental health problems as an important influence.

The association between mental health problems and engagement largely arose from the negative association between hyperactivity/inattention and engagement. However, when each mental health problem subscale was examined independently of the others, conduct problems and peer problems were also negatively related to engagement. A corollary of this is that a child with any one of these three problems during preschool may have trouble becoming engaged in classroom learning activities when they reach school. In contrast, children's levels of emotional symptoms were unrelated to their subsequent engagement, even when examined independently of the other subscales. The

role of emotional symptoms, or internalising problems more broadly, in influencing children's engagement should not be discounted based on these results alone, given that there is some evidence from other studies that internalising problems are related to engagement, in children as young as kindergarten and first grade (Normandeau & Guay, 1998; Wu et al., 2010). Factors specific to the current sample (such as their low incidence of internalising problems, and generally low-risk backgrounds) may explain these null results. Overall, it seems that mental health problems are viable predictors of engagement, potential intervention targets, and therefore important to continue to research.

Boys were at a disadvantage relative to girls from as early as preschool, having higher levels of overall mental health problems in preschool, and lower levels of engagement in school. However, these gender differences in mental health problems almost completely explained the gender differences seen in engagement. Specifically, once levels of mental health problems were adjusted for, the engagement gender difference was no longer evident. This finding suggests that by working on reducing boys' higher levels of mental health problems in preschool within interventions, with a specific emphasis on hyperactivity/inattention, boys and girls may start school on more equal footing with regards to their classroom engagement.

Finally, preschool mental health problems were related to subsequent engagement similarly for boys and girls; boys and girls with mental health problems were at equal risk for lower engagement in school. Although girls generally showed lower levels of mental health problems than boys, when they did experience problems, they were related to engagement just the same. And even though levels of externalising problems were generally higher in boys, and thus may seem somewhat 'normative' and socially appropriate, parents, teachers and service providers should be just as concerned about these problems in boys as among girls in regards to subsequent decrements in engagement.

10.2.3 Processes associated with classroom engagement.

This is the first study to use the Self-Systems Process Model (Connell, 1990; Connell & Wellborn, 1991) to examine associations between parent-child and teacher-

child relationships, self-concept, mental health problems and classroom engagement across the preschool to school transition. The mechanisms by which these preschool predictors were associated with reception classroom engagement were consistent with pathways specified within the Self-Systems Model. Specifically, relationships with parents and teachers characterised by high levels of warmth and low levels of conflict were associated with children's positive self-concepts, characterised by high self-esteem and self-efficacy. Positive relationships and self-concept were both associated with better emotional and behavioural mental health. In turn, good mental health was associated with higher levels of subsequent classroom engagement.

This is also the first study to examine mental health problems within the Self-Systems Model, and in doing so, brings together two established fields of research. The hypothesised role of mental health problems was a unique contribution of this research, arrived at from the synthesis of several separate research studies, and yet it emerged as the strongest and only direct predictor of children's engagement. Its relative importance suggests it should be considered more seriously in relation to children's engagement within the Self-Systems Model in future, and may also be important for older children with whom this model is used more frequently. As adapting this model has provided greater explanatory power in relation to predicting children's engagement, there is now the possibility of effecting greater positive change in engagement by working to improve all of these preschool variables within interventions.

Overall, these findings suggest that the Self-Systems Model is a useful framework for young children in their first year of school. Importantly, these findings illustrate that the same processes that are studied extensively in older children and adolescents are actually occurring much earlier in children's development than has been previously acknowledged. This younger focus is potentially more valuable, as these processes could be targeted for intervention even before children start school, so that positive change may be realised *before* children's academic trajectories begin to stabilise.

Finally, classroom engagement was uniquely associated with frequency of disciplinary action in year 1. This association shows that even though engagement is

important in its own right, as an essential part of adjusting to the school learning environment, it is also important for children's later schooling outcomes. It is also an important reminder that while good engagement may presage school successes, poor engagement may lead to negative 'cascade' effects (Masten et al., 2005) of alienation, rebelliousness, and withdrawal, and perhaps even school dropout without timely intervention.

10.2.4 Engagement from a resilience perspective.

Although there was evidence that the level of cumulative risk children experienced during preschool was negatively related to their classroom engagement in reception, the strength of this association was not strong. In fact, a number of children showed 'better than expected' engagement given their levels of risk, consistent with the definition of resilience.

The predictors and processes associated with 'better than expected' engagement, or resilience, were the same as those that were associated with absolute engagement levels, regardless of risk status. For example, good quality relationships with parents and teachers were associated with children's positive self-concepts, and both good relationships and high self-concept were associated with good mental health. In turn, good mental health was associated with educational resilience. Taking a resilience perspective enhances the study of engagement in the first year of school, as results show that not only may these preschool factors promote children's engagement at a general level, but that they may also help children engage in classroom learning by counteracting the adverse effects of risk, consistent with a 'main effects' resilience model (Masten et al., 2009).

An important reason for taking a resilience perspective was to determine if these preschool factors could specifically help children who experienced high levels of cumulative risk, and who were expected to need the most help regarding their engagement. Analyses revealed that, generally, both low- and high-risk groups of children benefited similarly from good relationships, self-concept and mental health in preschool. These results demonstrate the importance of such 'promotive' effects for good engagement under both low and high risk circumstances. They are relevant to the study of

resilience, as these processes may be able to change the schooling trajectories of at-risk children (Luthar, 1993; Luthar et al., 2000). And as all children will experience risk at some point, promoting these factors may still achieve beneficial outcomes in children currently at low risk, while setting important supports in place to help children cope with any *future* risk they may experience.

The only variable to demonstrate a 'protective' effect was parent-reported self-concept, which was found regardless of whether analyses examined associations between variables or between children (i.e., variable-centred or person-centred analyses). Specifically, the unique association between parent-reported self-concept and 'better than expected' engagement was only significant in high-risk children. Additionally, neither the unique nor total (i.e., considering shared variance) effect of parent-reported self-concept was related to 'better than expected' engagement under low-risk conditions. As parent-reported self-concept seems less important for promoting children's engagement when they have not experienced risk, it might be used effectively in targeted interventions for high-risk children.

Although the direct effect of parent-child relationship on engagement did not differ as a function of risk, its indirect effect through self-concept did. In other words, different *processes* were at play for low- and high-risk children. Thus, to promote self-concept and resilience within interventions, it may be advantageous to boost resources that benefit all children as well, like relationships with parents.

Without further empirical information, it is unknown why parent-reported self-concept was the sole factor to have a protective effect. As mentioned in chapter 8, a possible explanation is that, under high-risk circumstances, a child may need stronger feelings of competence and worth in order to cope, and if children do not experience risk, there is little that requires coping with. More detailed possibilities can be extrapolated from Rutter's (1987) theoretical examples. For instance, as cumulative risk may entail having young parents with low education levels and less income, at-risk children may not have had many opportunities for engaging in learning activities at home. These children may have few educational materials such as books and toys, less parental investment in

fostering engagement, and fewer experiences of mastery. This may explain why high-risk children may struggle to become engaged in classroom learning once they reach school. Without such engagement-promoting experiences from within their home environment, the challenging task of engaging in learning, possibly for the first time, in a new and unfamiliar environment, may require a good sense of perceived competence and worth to give children the confidence to take on this new challenge. In contrast, a good self-concept may matter less for low-risk children, as they are likely to have already had direct home experiences in engaging, and so a good self-concept would not be needed to initiate engagement, and, at best, would only consolidate it. A high sense of self-concept may also help at-risk children actively seek out learning experiences at school that they have been denied at home. Another possible mechanism, although less plausible at the preschool age, is that children with high self-concepts are able to distance themselves from the risk, such as removing themselves from family conflict situations, so that the negative effects on their subsequent engagement are lessened.

It may be that parent-reported rather than teacher-reported self-concept is protective because it is reported by the same informant who reports cumulative risk. This may not be a straightforward matter of informant bias, but instead related to the situational specificity of children's appraisals. Children's self-appraisals can be situation-specific, shaped by interactions and experiences within a particular context, and in relation to different roles (i.e., daughter, preschooler) (Byrne, 1996; Eccles, Wigfield, Harold, & Blumenfeld, 1993; Harter & Pike, 1984; Marsh et al., 1991; Shavelson et al., 1976). Parent-reported self-concept is likely to have been largely witnessed within the family environment, the same context in which cumulative risk is experienced (such as parental distress, low parental education, single parent caregiving). Thus, children's appraisals of competence and worth as a son/daughter in the home context are likely to be framed by their experiences of risk, and may be more important for coping with them. In contrast, how children see themselves as preschoolers (as witnessed by preschool teachers) may be more related to factors within the preschool domain such as the ability to learn and to

interact with other children, and may not necessarily help them cope with risk within the family domain.

Importantly, cumulative risk was also negatively related to each parent-reported hypothesised protective/promotive factor, yet unrelated to any of the teacher-reported hypothesised protective/promotive factors. This shows that high-risk preschool children were less likely to receive much-needed support from their parents. In contrast, the preschool environment appeared to function as a source of support that was unrelated to the experience of risk. These findings highlight the power of preschool environments, and of preschool teachers especially, to provide an outreach or 'arena of comfort' (Simmons & Blyth, 1987) to high-risk preschool children. The best chance of counteracting the negative effects of risk on children's engagement may be to strengthen the assets that are not adversely affected by it, and building alternative pathways to coping and engagement.

Indeed, results showed that when the quality of parent-child relationships was low, teacher-child relationship quality emerged as uniquely related to 'better than expected' engagement, over and above its indirect effect, and the direct effects of all other preschool variables. This was the only instance within this thesis where teacher-child relationship quality had a direct association with engagement, and had the strongest effect of all other variables, including mental health problems, which had otherwise been the most consistent predictor of engagement. In contrast, when parent-child relationship quality was high, no one variable had a unique effect on engagement, with only their shared effects being associated with engagement, and to a lesser degree. Thus, supportive teacher-child relationships are an important focus for the children who do not experience such support in their family environment.

Preschool may potentially be an ideal age for teachers to be able to compensate for the warmth and support of a caregiver, for two reasons. First, preschool teachers already place a greater focus on building socio-emotional competencies than on academic skills, and are able to provide greater individual support to children due to the relatively small child-teacher ratio (Alexander et al., 1988; Arnold et al., 2006; O'Donnell, 2008; Raver, 2002; Steering Committee for the Review of Government Service Provision, 2008).

Second, preschool-aged children may be accustomed to most adults as providing them with caregiving and emotional support (rather than solely academic guidance, for example), and so may be more receptive to this type of support from preschool teachers. It may be that such similarity in roles is needed for teachers to offer an alternative source of support and open up new opportunities in children's lives (Rutter, 1987, 2000).

10.3 Broader Findings

10.3.1 Robustness of results.

In considering these results all together, it can be seen that findings were quite robust across the various analyses used. First, the size and significance of associations between predictor and outcome variables varied little after adjusting for covariates including gender, the number of terms at school, Aboriginal/Torres Strait Islander origin, and public/private school attendance. In fact, even the proposed pathways between relationship quality, self-concept, mental health problems and engagement remained the same when considering these effects from a resilience perspective where, in effect, resilience scores represented residualised engagement after adjusting for levels of cumulative risk.

Second, gender was not found to significantly moderate the association between mental health problems and engagement, regardless of the statistical analysis used. In other words, mental health problems were associated with engagement similarly for boys and girls, whether statistically testing for differences using interaction terms within regression models, or descriptively examining differences either by plotting the interaction terms, or by conducting multiple-groups regression models. This consistent null finding is notable, given that these statistical techniques differed greatly in their power to detect interaction effects. More specifically, even though linear regression models may fail to detect existing interactive effects due to the notoriously low statistical power of interaction terms, this was unlikely to explain the non-significant interactions found here, given that similar null results also emerged from the other two methods used.

Third, the variable- and person-centred methods used to examine engagement from a resilience perspective essentially reached the same conclusions. Even though these

methods approached the investigation of resilience in slightly different ways, there were only minor variations in results. For example, the same variables were identified as significant predictors of resilience within both variable- and person-centred approaches, where parent-child relationship quality was the only non-significant predictor variable. Additionally, both methods suggested that while most of these predictor variables had promotive effects, being associated with engagement similarly for both low- and high-risk children, parent-reported self-concept showed a marked protective effect (being associated with engagement only under high-risk conditions). Finally, when looking specifically at the high-risk group of children, the same processes associated with resilience emerged in both variable- and person centred analyses. This convergent evidence suggests that results are not simply an artefact of the type of analysis used, and validates the operationalisation of resilience used within this thesis, and the construct of resilience more broadly. Although this level of consistency has not been demonstrated within other multi-method resilience studies, this is at least partly because none of these studies used directly comparable variable- and person-centred methodologies (Lengua, 2002; Masten et al., 1999).

Finally, results were generally replicated when using both parent- and teacher-reported predictors, with the only exception being the protective effect of parent-reported self-concept. Although the effect sizes within teacher models were generally slightly larger than their parent model counterparts, their relative size compared with other model pathways was similar. For example, of the four mental health problems subscales, hyperactivity/inattention showed the largest unique effect on engagement, and emotional symptoms showed the smallest (a near-zero) effect on engagement, when using either parent- or teacher-reported scores. These results provide evidence of convergent validity. This convergence is especially noteworthy considering that the cross-informant variable correlations were always small. Thus, although children's self-concept and mental health problems may manifest or be perceived differently at home and at preschool, the processes by which they influence engagement appear to be similar.

Rather than placing undue emphasis on the results arising from any one analysis type or reporter, considering these different techniques and models together has provided

a more holistic view of children's engagement. As results were not simply a function of one type of analysis, this allows more confidence to be placed in the conclusions drawn.

10.3.2 Informant versus situational effects.

Preschool teacher-reported predictors generally emerged as having stronger associations with engagement (reported by reception teachers) than did their parent-reported counterparts. Compared with variables reported by parents, the bivariate associations between teacher-reported predictors and engagement were always larger, and the teacher regression models always explained more total variance in engagement. There are a few possibilities as to why this occurred.

First, although engagement and its predictors were always reported by different informants, when using teacher-reported predictors, both informants were teachers. Although these teachers were situated at different sites (i.e., preschool and school) and did not have contact with one another, they would have received similar training and work experience, and may have interacted with children and interpreted their behaviour in a similar manner. And, compared with parents, both preschool and school teachers are accustomed to dealing with many children of the same age, and so may have a more refined and perhaps accurate benchmark of what constitutes average versus extreme behaviour. In a way, this would represent somewhat of an 'informant' effect.

However, it is also possible that children's emotions, thoughts and behaviour are somewhat situationally specific, with the corollary being that children's experiences within the preschool environment (as witnessed and reported by preschool teachers) may be more related to engagement at school than are their home experiences (as reported by parents). For instance, children's relationships with parents and teachers may have differential effects on their engagement, given that they are formed in different contexts. This may occur due to the fact that the values and beliefs of these significant adults shape children's self-concept (A. J. Martin & Dowson, 2009). In good quality relationships, children internalise relationship figures' achievement goals and appraisals, and judge themselves accordingly. As different social partners encourage and reward different skills, this may result in several slightly differing, domain-specific self-concepts (A. J. Martin &

Dowson, 2009). In turn, these domain-specific self-concepts may influence children's engagement differently (A. J. Martin & Dowson, 2009).

Although parents' and teachers' views of school readiness are similar in many ways, parents tend to place more emphasis on academic skills and knowledge (such as counting and writing), whereas teachers value curiosity, social development, and adjustment to classroom demands (Dockett & Perry, 2004; Harradine & Clifford, 1996; West, Hausken, & Collins, 1993). Indeed, preschool teachers constantly encourage and scaffold school readiness and engagement skills of sitting still, paying attention, participating, sharing and taking turns (Department of Education Training and Employment & Department of Education and Children's Services, 2005). Children's appraisals of themselves as students and learners may then have a larger impact on their engagement than their perceived identity as a son/daughter. This supposition was supported empirically: teacher-reported self-concept showed a larger total effect on engagement than did parents' self-concept ratings.

10.3.3 Different functions of predictor variables.

These results show that *all* of the preschool variables examined within this thesis were related to children's subsequent engagement in reception. However, they all did this in slightly different ways, and their relative importance differed depending on the particular group of children studied. Thus, the particular variable/s selected for use in intervention programs could be matched to the target population, and in relation to program goals, scope, and budget.

Promoting children's relationships with their parents and particularly teachers may be preferred as a cost-effective option, given that they promoted engagement by developing other strengths of positive child self-concept and mental health (Luthar & Brown, 2007) Thus, by focussing on just two factors (parent-child and teacher-child relationships), this approach may mobilise *multiple* strengths to improve children's ability to cope with the school transition and become engaged in classroom learning. Teacher-child relationships might be prioritised over parent-child relationships, given that they had the larger effect overall, but especially as they had the greatest positive impact on engagement

when parent-child relationship quality was low. Thus, programs promoting teacher-child relationships may either choose to target only the children identified as having poor parent-child relationships, or instead give these children *greater levels* of teacher support within universal interventions.

Self-concept may also be selected as a target for intervention because of its ability to promote engagement by improving children's mental health. Additionally, self-concept was the only parent-reported variable to have a direct positive association with engagement for children with high levels of cumulative risk. Thus, it may be especially beneficial for at-risk children, and may directly promote their coping and engagement in the presence of risk. For this reason, self-concept may be a worthwhile focus for interventions that target vulnerable children.

To achieve the most immediate benefits in engagement, focussing on mental health problems might be favoured, given they had the largest and most direct effect on engagement in the majority of analyses. This approach may also avoid the risk of intervention effects being diluted through the multiple chain reactions that linked other factors studied here with engagement. For these reasons, targeting children's preschool mental health problems might be considered as 'the safest bet'.

10.3.4 The importance of the first school year, and the potential of preschool.

In sum, the findings from this thesis illustrate how children may successfully adjust to their first year of school by becoming engaged in classroom learning activities, given their experiences prior to this transition during preschool.

These findings can be interpreted in two ways. First, the overwhelming viewpoint is a positive one, given that the majority of the sample experienced high quality relationships and self-concept, and low levels of mental health problems. This cumulative support during preschool was associated with higher levels of engagement with classroom learning activities, getting children off to a successful start at school. Second, these findings also illustrate that, for some children, negative experiences tend to accumulate, with poor quality relationships also giving rise to lower self-concept and greater mental

health problems. This pattern of disadvantage during preschool continues to affect children during the first two years of school, associated not only with a poorer start to school in terms of lower classroom engagement, but with school behavioural issues in the following year. Such negative 'cascade effects' (Masten et al., 2005) are then likely to continue throughout these children's schooling careers. Although these preschool factors were only associated with engagement to a relatively small degree, it is important to consider that they could predict differences in children's engagement as early as the first school year. Relatively small initial influences in engagement in this first year can have a large impact on children's longer-term schooling outcomes, given that differences found between children in their first school year tend to magnify over time (Tach & Farkas, 2006). In short, these results highlight not only how things can go well with such basic but fundamental resources present in children's lives, but also how outcomes for disadvantaged children will continue to get worse without intervention.

Both of these viewpoints are equally important. Together, they show the potential for negative trajectories to be changed into positive ones, by identifying and altering key preschool experiences. Both viewpoints also highlight the preschool year as an important time in which such intervention may help get children off to a successful start to school, so that children's first impressions of school and of learning can be positive ones.

10.4 Methodological Considerations and Future Research

The results from this study must be interpreted in light of several methodological issues. Awareness of these issues may help other researchers in planning related research.

10.4.1 Considerations specific to scale development.

Several issues arise from the preliminary nature of the examination and development of the RAPS-R engagement scale among 5-year-olds. First, without a second sample with which to run confirmatory factor analyses, the fit of the factor structure determined here could not be verified. However, scale development is an iterative process, and this study has provided a solid basis from which to build confirmatory analyses. Second, as the engagement questionnaire was only administered on one occasion, test-

retest reliability and stability in engagement over longer time periods could not be examined. Third, it was beyond the scope of this study to include another teacher-reported engagement measure to assess convergent validity, given the large number of scales teachers were already completing (not only for this thesis, but also for the larger longitudinal project this thesis was subsumed within). However, it is promising that other studies report similar correlations (in both strength and direction) as those found here between teacher-reported engagement assessed using the TRSSA and (1) teacher-child relationships and (2) school avoidance (Birch & Ladd, 1997; Buhs, Ladd, & Herald, 2006; Valiente, Lemery-Chalfant, Swanson, & Reiser, 2008). To address these limitations, further RAPS-R scale development research among children in their first school year should (1) test both the factor structure found in the current sample, and the structure found in older children by Wellborn (1991) through confirmatory factor analysis, and (2) using another teacher-reported engagement measure in addition to the RAPS-R (e.g., the TRSSA - Birch & Ladd, 1997) to address convergent validity. The possibility of an undifferentiated, unidimensional scale should still be given serious consideration within these confirmatory analyses, while the development of engagement across early childhood is still relatively unknown.

Finally, as total scores on the emotional engagement subscale could not distinguish between many of the children, this scale was considered psychometrically inadequate for further use in this thesis. As a result, the predictors and processes of emotional engagement could not be examined in as much depth as those for cognitive-behavioural engagement, which became the focus of the remaining thesis chapters. However, basic bivariate correlations between these two engagement subscales and several theoretically-related outcome variables (e.g., school avoidance, school progress) suggested that both emotional and cognitive-behavioural engagement were related similarly to these school outcomes (in both size and significance). Given this, it is possible that further use of the emotional engagement subscale may not have contributed any new information, over and above results obtained using the cognitive-behavioural engagement subscale. However, without empirical evidence, this point remains speculative. Before this subscale is used in

future investigations, more research and development of the emotional engagement subscale should be conducted to ensure it can discriminate well between young children, and can correctly target their emotional engagement levels. This might be achieved by developing more emotional engagement items, and in particular, by including more items related to positive emotions; it would be less likely for all children to be rated as highly engaged, as opposed to 'not disengaged', reflected in the negatively worded items. Including items that assess more complex and positive emotions, such as pride and satisfaction, may augment the construct of emotional engagement. In this way, the emotional engagement levels of all children may be measured more accurately.

The cognitive-behavioural engagement subscale could also be further improved. As a ceiling effect was also seen for this subscale (albeit much less marked than for the emotional subscale), future investigations should include more developmentally complex cognitive engagement items, such as strategy use or meta-cognition, to increase discrimination between children.

Further analysis of the RAPS among older children is a critical next step, and will have implications for the development of this scale for school children of all ages. It is important to determine whether the ceiling effects seen in the cognitive-behavioural and emotional scales are inherent in the items, or are due to the young age of the current sample. Perhaps these items represent low to moderate engagement levels across various samples, in which case teachers may tend to award higher ratings on these items to older children as well. The RAPS will then also need to be redeveloped for older children to assess their engagement reliably. Alternatively, items may be rated highly among young children only, given that engagement levels are higher in the early school years, with decreases documented across the school grades (Eccles et al., 1984; Fredricks et al., 2003; Marks, 2000; McDermott et al., 2001; Tucker et al., 2002; Wigfield et al., 2006). If this is true, then several similar but developmentally-tailored scales should be constructed to measure engagement among children of all ages accurately.

10.4.2 Broader considerations.

Other methodological considerations apply to several analyses within this thesis. Firstly, the associations between children's relationships, self-concept and mental health problems were cross-sectional, all assessed in preschool. Thus, there is no temporal precedence to support the proposed direction of these pathways, and thus the associations between these variables cannot be considered to be causal (as discussed previously in section 3.4, see also Hill, 1965; Höfler, 2005; Rothman et al., 2008). However, the directions of influence proposed here were consistent with previous theory and longitudinal research (Connell & Wellborn, 1991; Fantuzzo et al., 2005; Hair et al., 2006; Skinner et al., 1998; Smart et al., 2008). It is possible that reciprocal relations existed between these constructs (see Doumen, Verschueren, Buyse, Germeijs, & Luyckx, 2008; J. N. Hughes et al., 2008; Skinner & Belmont, 1993), but this could not be confirmed using the current data. As another consequence, earlier levels of each outcome variable (e.g., self-concept and mental health problems in the toddler years, or engagement in preschool) could not be adjusted for. If this could have been done, the significant pathways may have disappeared, suggesting that the associations were mediated through earlier functioning. Nonetheless, the simple bivariate associations between these variables illustrated that they were all meaningfully related, regardless of the direction of influence, and were all important predictors of children's subsequent engagement (either directly or indirectly).

Second, the variables used to assess the cross-sectional associations between preschool predictor variables were reported by the same informant (i.e., parent, teacher), and thus would contain some degree of shared method variance. However, as (1) many of these associations were moderately large, (2) similar (though slightly smaller) associations existed when using two different informants, and (3) significant bivariate associations were found between engagement (the only variable reported by reception teachers) and most other variables, it is likely that significant, albeit smaller, associations would have been found if different reporters were used. However, these 'informant' effects may not have been solely due to shared method variance, but may also be a result of children's self-

concept and mental health problems being situationally specific (i.e., different at home and at preschool).

Third, even though a strength of this thesis was the use of two informants (i.e., parents and teachers), these 'outside' informants are not always aware of children's internal beliefs and emotions (La Greca & Lemanek, 1996; Rutter, 2000; Smith, 2007). Because of this, the children's self-esteem, self-efficacy, emotional problems and emotional engagement had to be inferred through their behaviour, and thus may not have been completely valid. Unfortunately, this is a common caveat within early childhood research, given the difficulties of obtaining valid and reliable self-reports from young children, and the large amounts of time and resources needed to conduct detailed observations. For these reasons, it was beyond the scope of this study to conduct interviews with and observations for all of the children in the sample.

Future research should test the path models examined here using three waves of data to provide completely longitudinal support for the direction of the proposed effects. Within this, assessing all variables at each wave will allow researchers to predict the change in each outcome variable, and gain information on the direction of effects, including reciprocal relations, lag effects, and other more complex associations (e.g., J. N. Hughes et al., 2008). Using different informants to assess each model variable (including observers and the children themselves) will clarify effect sizes after eliminating shared method variance, and provide a more detailed and holistic perspective on the predictors of young children's engagement.

As the current sample of children was recruited from one school district during preschool, and many remained within this district when they started school, children were nested within schools, and also within classrooms. Furthermore, the majority of preschool and reception teachers reported on multiple children within their classroom. Thus, the data were not completely independent. Clustering effects may well have been present, where greater variance existed between classrooms than within them (Hamre et al., 2008; Mashburn, Hamre, Downer, & Pianta, 2006). If clustering was indeed present in the current data, this may have been in part due to differences between raters (e.g., years of

teaching experience) influencing their *interpretations* of the children's behaviour, and their subsequent scale ratings they awarded. However, these effects could also reflect reality, in that due to the effects of different teaching practices and expectations between teachers, children may behave more similarly within than between classrooms. Ideally, future research would explore and account for such effects using techniques like multilevel hierarchical linear modelling (Bryk & Raudenbush, 2002). As few studies assessing factors such as teacher-child relationship quality and engagement among young children have examined clustering effects, much more remains to be explored.

Finally, the community sample examined within this thesis was quite well-functioning, generally experiencing high levels of parent-child and teacher-child relationship quality, self-concept, and classroom engagement, and low levels of mental health problems. Furthermore, for several of these variables, the sample's functioning was significantly higher than that of the children lost due to attrition over the course of the study. These points considered, it is likely that a number of children within the wider schooling community (many whose families would have declined to participate in this study) would not have enjoyed such high levels of functioning. Thus, these results may not be completely representative of the wider community, or directly generalisable to other samples. Especially pertinent to the resilience perspective employed in this thesis is that few children had experienced very high levels of cumulative risk. Consequently, it is possible that the variables identified here as positively associated with engagement over and above the negative effects of risk may lose their beneficial effects under extremely high risk conditions. Furthermore, interventions that aim to promote these variables within high-risk samples may not be effective until the actual risks are addressed, such as providing the financial and emotional support needed for mothers to leave their abusive partners.

As a related consequence of the high functioning of the sample, the limited variance among many variables may have reduced the statistical power available to detect true effects. As one possibility, the significant associations found here may show larger effect sizes among more varied samples. Furthermore, the few non-significant associations

found may have been at least partially due to the limited variance, and effects may actually have existed but could not be detected. Future research may reduce the likelihood of this occurring by using larger and more representative samples. To examine issues that generally have low incidences in the general community, such as childhood internalising problems, it may be worthwhile to over-sample children who experience these problems to increase sample variance, and statistical power. In doing this, it is more likely that actual effects will be detected statistically.

Every preschool variable examined in this thesis was significantly implicated in the processes related to children's classroom engagement. Nonetheless, these results only provide four variables on which to focus within interventions, and the statistical model still left a considerable proportion of unexplained variance in children's engagement. It is essential to develop knowledge on as many predictors of engagement in the first school year as possible, to have maximal explanatory power in engagement, and therefore have the greatest chance of making a lasting and significant positive change in children's engagement through intervention. Future research should continue to identify more variables that predict children's engagement, and determine the broader processes linking them through the development of more complex process models.

10.5 Implications

This study provides a useful evidence base from which recommendations for the promotion of children's engagement can be made. To begin with, groups of preschool children who are at risk for low classroom engagement can now be identified, and re-directed onto more positive pathways. Preschool teachers and service providers are ideally placed to identify any existing problems during the preschool years (Arnold et al., 2006; Australian Government Department of Health and Ageing, 2010). The results of this research show that preschool teachers are already able to notice and report on various relational, self-concept and mental health symptoms. Additional training would help them to (1) identify what levels and co-occurring patterns of these symptoms are problematic, and (2) how to respond, including use of 'in-house' programs and support, or referral onto other services. If the recognition of problems is postponed until children start school,

children may already be suffering decrements in their engagement, and negative cycles involving mental heath problems and various aspects of school withdrawal may have already started (Finn, 1989, 1993; Hinshaw, 1992; Masten et al., 2005; Tach & Farkas, 2006).

Results suggest that preschool interventions that strengthen children's relationships with their parents and preschool teachers, and their self-esteem and self-efficacy, and reduce levels of mental health problems may produce incremental gains in engagement by school age. However, of all of these variables, it seems that promoting children's mental health may have the most immediate positive effect on children's engagement. In particular, concerted attention should be given to reducing externalising problems, including hyperactivity/inattention and conduct problems. These types of problems are not only the most prevalent among preschool children, but also have the strongest negative associations with engagement. Although mental health problems have largely been ignored in previous research in relation to children's engagement, these results support the assertion that good mental health is an important prerequisite for children's early school success by helping them adapt to the classroom environment, and become involved in learning activities (McWayne & Cheung, 2009; Volpe et al., 2006).

Perhaps more importantly, the largest overall and most cost-effective benefits may come from building children's relationships with adults, as good relationships generated higher self-concept, and both relationships and self-concept promoted good mental health (Luthar & Brown, 2007). Thus, teachers and parents may do well to consider that they can support children's transition to school and increase their chances of educational success by providing opportunities for success in an environment characterised by warmth and support. This information may be reassuring and encouraging for parents who do not have (1) money to invest in educational resources including books, toys, and computers, or (2) the time or personal efficacy to teach children school-related skills, such as reading. This may be especially helpful for engaging parents with low education levels or negative attitudes towards education within interventions, as they may feel more comfortable in

working to strengthen their already existing parenting skills, than in learning new and unfamiliar educational skills and teaching techniques.

Nonetheless, these results support the assertion that interventions targeting factors across multiple systems, including the family, the school, and the child, are likely to achieve the greatest benefits (Luthar & Cicchetti, 2000; Wyman et al., 2000). Children need to develop internal strengths, including a belief in their abilities, but they cannot do it alone. External support from adults can help develop these internal strengths through encouragement, modelling, and scaffolding processes, for example. Supportive adults are also important for children to turn to when they find it too hard to cope on their own. To achieve this level of 'cumulative protection' (Fergusson & Lynskey, 1996; Luthar & Cicchetti, 2000; Masten & Coatsworth, 1998; Masten et al., 2009; Wyman, 2003; Wyman et al., 2000), intervention programs must not only work directly with children, but also involve their parents and teachers, to ensure children's home and school environments are consistently supportive and encouraging. For example, if parents and teachers are encouraged to help children complete intervention exercises and practice coping strategies, in addition to the program components run by intervention staff, children's self-concept and mental health are likely to experience even greater improvement. This is because improvements will arise not only as a result of the strategies learnt from within exercises, but also from the greater support and involvement from within children's relationships with these adults, and from the increased likelihood that the strategies will continue to be encouraged within both the home and school environments (Shonkoff & Phillips, 2000).

One example of such a program is 'Fun Friends', developed in Australia to promote coping and resilience in preschool children (Pahl & Barrett, 2007). As well as participating in the program with their teachers in the preschool classroom setting, children take home workbooks to complete with parents. Home exercises designed to foster coping include discussing good and bad daytime experiences at the dinner table, and sharing favourite experiences when going to bed at night. Other home activities are designed to boost children's self-concept and mental health, such as recognising and changing negative and unhelpful 'red' thoughts into positive and helpful 'green' thoughts.

In this way, children are able to practice and refine the skills learned at preschool in a supportive and encouraging home environment.

Another notable Australian intervention is the KidsMatter early childhood initiative, which is designed to improve the mental health of preschool children (Australian Government Department of Health and Ageing, 2010). This downwards extension of the successful KidsMatter primary schools initiative is currently being piloted in over 100 preschools and long daycare centres across all states and territories of Australia, in collaboration with the Commonwealth Government. The program aims to improve children's mental health by promoting children's self-esteem, positive relationships with adults, and social-emotional skills. Importantly, KidsMatter emphasises shared community responsibility for children's wellbeing. As such, a major aim is to involve families, teachers, and service providers in program development and implementation, and to improve partnerships and communication between them. At each preschool site, families are represented in the KidsMatter leadership team that plans program implementation. Families are also asked to identify children's areas of strengths and difficulties, as potential targets for intervention. Finally, families receive information sheets and resource packs that discuss the preschool intervention strategies, and provide tips for implementing them at home.

Ideally, to ensure consistency between what is taught and encouraged in home and preschool environments, children, parents and teachers should all participate in one integrated intervention together in the one location. This integrated approach may also have additional benefits, such as enhancing the parent-teacher relationship, and ensuring that parents understand and are able to correctly implement program techniques. This may be especially important for parents with low education and literacy levels, who may have difficulty understanding written material within take-home workbooks. For example, within the Fun Friends program, parents are also encouraged to attend information sessions that explain and teach the program strategies (Pahl & Barrett, 2007).

However, a key issue associated with the success of such integrated programs is engaging families. This is especially important for high-risk families, who have the most to

gain from such programs, and yet are generally the hardest to reach, and to retain for the entirety of programs (Ghate & Hazel, 2002; Shonkoff & Phillips, 2000; Sanders & Cann, 2002, in Watson, 2005). As case in point, the families who dropped out of this thesis project between study waves were more likely to have experienced several risk factors, including paternal unemployment, single parent family composition, and being of Aboriginal/Torres Strait Islander descent. The low engagement of high-risk families in intervention programs is a complex issue, and may be due to a number of factors, with physical and practical barriers including time pressures, and a lack of transport or childcare facilities, and social barriers include wariness of involvement with government services, conceptions that parenting practices will be judged and criticised, the stigma associated with labelling and diagnosing, and perceptions that programs will not meet their needs (Katz, La Place, & Hunter, 2007; Moore, 2009; Shonkoff & Phillips, 2000; Watson, 2005).

Another barrier to attending such programs, which does not apply solely to high-risk families, is that working parents may not be able to attend preschool-based programs that are run during working hours (Katz et al., 2007; Watson, 2005). In the current sample, 46% of the children had two parents in paid employment, while an additional 45% had one employed parent. For this reason, it is likely that a large number of these parents would have difficulty attending at least some, if not all program sessions, if they were held during normal preschool sessions.

Considering these issues, a number of strategies could be implemented to increase the participation rates and success of intervention programs. Free childcare and transport could be provided at each session, to make it easier for at-risk families to attend (Katz et al., 2007; Watson, 2005). If possible, sessions could be held outside of working hours. And as much as possible, already existing support services should be mobilised and brought together in the one location (Katz et al., 2007; Luthar & Cicchetti, 2000; Mustard, 2008). Ultimately, for a program to work in any one community, it should be developed from consultation with the families it hopes to involve (Shonkoff & Phillips, 2000).

A promising example comes from the recently-established South Australian Children's Centres, developed for families of children from birth to eight years, which

incorporate childcare, preschool education, health care including nutrition advice and speech therapy, parenting advice, family counselling and support groups, and community development activities, all in the one location (Government of South Australia, 2010). These centres are located in areas of high social disadvantage, to provide greater access to the families who need the most support. Centres are also located on school sites, making it easier for parents who also have school children to attend. By providing access to multiple services, a more comprehensive and individually-tailored intervention program can be developed for each child, which reduces the likelihood of parents receiving inconsistent information. Finally, children's centres attempt to empower parents in relation to their parenting skills, by obtaining their input into program development, and by enabling them to teach their recently acquired skills to new parents.

This thesis also highlights the potential for preschools to act as intervention sites, for several reasons. First, the interactions between preschool children and their teachers have an important influence on their preschool and school-age development, and these relationships may be best enhanced within their normal context. Second, most Australian children attend preschool prior to starting school. And third, parents and children already trust preschool staff, and are familiar with the preschool environment, which may increase their likelihood of participating in preschool-based programs. This finding validates the Australian Government's decision to increase access to universal government-funded preschool for all four-year-old children (Australian Labor Party, 2007). As this policy is gradually phased in, and more children attend preschool for 15 hours a week (up from 11 hours in South Australia), there may be greater time in the day to incorporate intervention programs into the existing curriculum.

However, for preschool-based interventions to be maximally effective, they must be developed and implemented in conjunction with preschool and education sector staff. This will ensure that (1) the intervention is logistically feasible to conduct during the course of a normal preschool day, and (2) preschool staff facilitate program implementation, and adhere to program fidelity (Australian Government Department of Health and Ageing, 2010; Hilferty, Redmond, & Katz, 2009). The benefits of working in

partnership with education staff were powerfully demonstrated in relation to the data collection for the longitudinal project within this thesis. The success of this project was a direct result of the supportive partnership established with the Southern Sea and Vines school district staff. By developing the research project around common interests, and incorporating the perspectives of the education staff in the project development, the project was one that staff considered relevant. Ensuring that preschool staff members supported the project was instrumental in building rapport with the families of preschool children. And as teachers were invested in the project, they were happy to help recruit families of preschool children, which greatly increased response rates given they had greater access to families, and the families knew and trusted them. This collaboration also ensured that the data collection was feasible to conduct within school settings. We also ensured that data collection benefited the district teachers, by arranging for survey completion to count towards teacher training hours, and for the resultant data to be used for teachers' compulsory research reports. These procedures contributed to the fact that all teachers completed surveys as requested, with many teachers completing surveys for multiple children, up to 47 in one instance.

Importantly, these results illustrate that a universal intervention program may produce approximately equal benefits for most preschool children. This includes both boys and girls, and both advantaged and disadvantaged children. It may also be logistically easier and more economic to implement the one program, rather than several specific programs to different sub-groups. This being said, greater levels of this program could be offered to the children who are identified as having a greater need, such as boys, and children experiencing cumulative risk within the family environment. These children demonstrated poorer functioning from as early as preschool, including greater mental health problems in preschool, and lower engagement in school. Greater levels of support may help these children start school on more equal footing to their classmates, and may reduce the likelihood of divisions widening over time. In contrast, the children with low risk and highly supportive relationships with parents may not need nor benefit from

programs as much, given they have already had enough confidence-boosting experiences at home to establish and sustain high levels of engagement.

10.6 Conclusion

The key finding of this thesis is that the quality of children's relationships with their teachers and their levels of self-concept and mental health problems during preschool are significantly related to classroom engagement in the first year of school. Thus, there is the potential to make a positive difference in young children's lives by improving the quality of these relationships, boosting their self-concept, and minimising their levels of mental health problems, before they commence school.

Preschool intervention programs which can achieve these goals may not only have immediate benefits for children's classroom engagement in their first school year, but they may also have flow-on effects on children's later school achievement, risk behaviours, and even the likelihood of staying in school. In this way, interventions may have the potential to set children on different schooling trajectories.

By investing in children during the preschool years, we may ultimately help children start school ready and eager to learn, giving them the best chance of success in their schooling careers.

APPENDIX A

THE 'HEALTHY MINDS HEALTHY FUTURES' PROJECT

APPENDIX A

A1 Healthy Minds Healthy Futures Child Resilience Project

The current thesis was undertaken as a part of a larger longitudinal project, the *Healthy Minds Healthy Futures* Child Resilience Project, running through the University of Adelaide. This 3-year project spanned 2006 - 2008, or alternatively, preschool to year 1 (the second year of formal schooling) for participating children. Both parent- and teacher-reported measures were collected at each time point; however, children were not subsequently excluded from the *Healthy Minds* project if they had only partial data (i.e., with missing data waves, or only information from one reporter). Consequently, data for a larger number of district preschoolers, and including a larger number of questionnaire measures, were included in the larger project than in the current thesis. All measures (for both the current thesis and the broader longitudinal project) were contained within the same questionnaire booklets. Consequently, this thesis project was contained within the constraints of the broader project. It can be helpful to interpret the current methods and rationales with the demands of the broader project in mind. For example, all recruitment procedures were specific to the *Healthy Minds* study, and any other specific eligibility criteria for this thesis were only applied following recruitment. However, some methods explained here were specific to the current thesis.

A2 Southern Sea and Vines School District

The Southern Sea and Vines district (a government-funded school, not statistical, district) is large and diverse, beginning approximately 30 km south of the Adelaide CBD, and roughly spanning the Fleurieu Peninsula of South Australia (see Figure A1). It is bordered by the coast to the West, and to the South – but including the large and remote Kangaroo Island (4400 km^2), bordered by the rural wine region of Langhorne Creek to the East, and bordered by the southern metropolitan suburb of Christie Downs, and the small regional hills towns of Clarendon and Echunga to the North, covering approximately 8000 square kilometres. Consequently, it includes a mix of suburban, rural country and remote areas. This area was chosen as the focus of study as it contains a diverse population, having some of the highest and lowest levels of social disadvantage in South Australia. For example, Christie Downs, which has a large amount of government-run low-rent housing,

A

NOTE:
This figure is included on page 327 of the print copy of the thesis held in the University of Adelaide Library.

B

NOTE:
This figure is included on page 327 of the print copy of the thesis held in the University of Adelaide Library.

Figure A1. Panel A shows a map of South Australia, with Australia inset. Adjoining states are grey. The Southern Sea and Vines school district is shaded yellow, and other South Australian schooling districts are shaded green. Panel B shows a map of the Southern Sea and Vines school district in South Australia. Both maps are taken from http://www.decs.sa.gov.au/southernseaandvines/. All distances are approximate.

ranked in the 4th and 3rd percentiles for the state and country, respectively, for the Index of Relative Socio-economic Disadvantage (SEIFA: Australian Bureau of Statistics, 2008b). Conversely, the small hills towns of Kangarilla and Clarendon ranked in the 93rd and 91st percentiles for the state and country, showing some of the lowest levels of socioeconomic disadvantage (Australian Bureau of Statistics, 2008b).

This district includes 27 preschools, and also 33 primary schools (or area schools with a primary schooling component). Embedded within the geographical limits of this government school district are also a number of private (e.g., Montessori) preschools and private (various Christian denominational and non-denominational, and Steiner) schools. This district has been found to resemble South Australia as a whole regarding its demographic characteristics (Australian Bureau of Statistics, 2004; Miller-Lewis, Searle, Sawyer, Baghurst, & Hedley, in progress).

A3 Research partnership with the Southern Sea and Vines School District of DECS

The *Healthy Minds* project arose from a research partnership between University researchers and DECS Southern District office staff, to examine the wellbeing of young district children. The project was a collaborative effort between both organisations. Consequently, a focus group comprising university researchers, preschool and school educators, school-based allied health professionals (in areas of speech pathology, psychology, disability services and special education), and district office staff was established to design the project. This focus group also played a large part in the development and modification of new and existing questionnaire and interview tools (see Sections 3.2.2.2.1, 3.2.2.3, and 3.2.3 of Methods). The inclusion of these health and education professionals meant that all procedures were logistically feasible to be enacted in preschool and school sites and were likely to be accepted by parents and teachers, questions were considered developmentally appropriate, and also relevant and of value to teachers and parents. In this way, it was expected the project would be welcomed by teachers, not only because it was 'district-wide' and endorsed by District Office leaders, but because it was investigating something of value to educators.

As a part of the partnership, each site received a confidential 'profile report' summarising basic descriptive statistics of the participating children at their site, which could be used for their compulsory Learner Wellbeing Framework 'inquiry question'. Additionally, teachers involved were able to count their time involved in the project (e.g., attending meetings, completing surveys) towards their quota of 'professional development' hours that they needed to meet each year. Teachers were also reimbursed for the time taken to complete surveys (AUD $6 for each survey completed), to be spent at the school site's discretion (e.g., paid for teacher release time to complete surveys, educational resources for children).

The success of the *Healthy Minds* project (especially the percentage of families who participated) would have been unattainable without this partnership, due to the facilitation and endorsement by district office leaders, the contribution of the focus group, and the recruitment efforts of preschool teachers.

APPENDIX B

STUDY MEASURES†

† The paper-administered measures are displayed here in a smaller font size than when they were administered to parents and teachers, to enable them to fit within thesis page margins

About Your Relationship with the Child

Please reflect on the degree to which each of the following statements currently applies to your relationship with the child. Using the scale below, please put a clear '**X**' in the appropriate box for each item.

NOTE:
This questionnaire is included on page 332 of the print copy of the thesis held in the University of Adelaide Library.

About the Child's Behaviour and Wellbeing

For each item, please put a clear '**X**' in the box which best describes the child's behaviour in each situation. Please give your answers on the basis of the child's behaviour **over the last six months.**

For each item, please place an '**X**' in one box	Never	Seldom	Sometimes	Usually	Always
1. This child adapts to new situations, feels comfortable in new settings, and enters easily into new activities.	☐	☐	☐	☐	☐
2. This child hesitates to express his/her opinions, as shown by extreme caution, failure to contribute, or a subdued manner in situations where a simple topic is being discussed.	☐	☐	☐	☐	☐
3. This child becomes upset by failures or other strong stresses as shown by such behaviours as pouting, whining, and withdrawing.	☐	☐	☐	☐	☐
4. This child is chosen for activities by his/her friends and peers, and his/her companionship is sought and valued.	☐	☐	☐	☐	☐
5. This child becomes alarmed or frightened easily, and becomes restless or jittery when routines are changed or new people come to visit.	☐	☐	☐	☐	☐
6. This child asks for much support and reassurance from his/her peers or parents, as shown by seeking to be around them or frequent questions as to whether he/she is doing well.	☐	☐	☐	☐	☐
7. This child is eager to begin new tasks.	☐	☐	☐	☐	☐
8. This child indicates he/she is not doing as well as he/she would like by showing disapproval or disappointment with his/her work products or school work.	☐	☐	☐	☐	☐
9. This child shows confidence and assurance in his/her abilities as shown by his/her actions toward his/her parents, siblings, and friends.	☐	☐	☐	☐	☐
10. This child is able to make decisions regarding things that affect him/her (for example, making choices regarding "likes" and "dislikes").	☐	☐	☐	☐	☐

About the Child's Behaviour and Wellbeing (cont).

For each item, please put a clear '**X**' in the box which best describes the child's behaviour in each situation. Please give your answers on the basis of the child's behaviour **over the last six months.**

For each item, please place an '**X**' in one box	**Never**	**Seldom**	**Sometimes**	**Usually**	**Always**
11. This child shows self-direction and independence in activities.	☐	☐	☐	☐	☐
12. This child refers to himself/herself in generally negative terms.	☐	☐	☐	☐	☐
13. This child becomes either very aggressive or very pouty and withdrawn when scolded or criticized.	☐	☐	☐	☐	☐
14. This child shows a strong sense of self-esteem, self-respect and appreciation of his/her own worthiness.	☐	☐	☐	☐	☐

NOTE:
This questionnaire is included on page 334 of the print copy of the thesis held in the University of Adelaide Library.

About the Child's Behaviour and Wellbeing

For each item, please put a clear '**X**' in one box for Not True, Somewhat True or Certainly True. It would help us if you answered all items as best as you can even if you are not absolutely certain. Please give your answers on the basis of the child's behaviour **over the last six months**.

NOTE:
This questionnaire is included on page 335 of the print copy of the thesis held in the University of Adelaide Library.

About Your Child's Family Background

*Please indicate whether any of the following events occurred in your child's family during the past 12 months by placing a clear '**X**' in either the 'Yes' or 'No' box.*

In the last 12 months…….		**Yes**	**No**
1.	The child suffered a serious illness, injury or assault	☐	☐
2.	A close family member (child's parent, sister, or brother) suffered a serious illness, injury or assault	☐	☐
3.	A close family member (child's parent, sister, or brother) died	☐	☐
4.	A close friend of the family or other relative (eg. grandparent, cousin, aunt) died	☐	☐
5.	Parents separated/divorced due to marital difficulties	☐	☐
6.	A parent broke off a steady relationship	☐	☐
7.	A family member had a serious problem with a friend, neighbour or relative	☐	☐
8.	A parent was seeking work unsuccessfully for more than one month	☐	☐
9.	A parent lost their job (sacked/redundant, contract ended)	☐	☐
10.	A family member had a major financial crisis	☐	☐
11.	A family member had problems with the police or had a court appearance	☐	☐
12.	Something the family valued was lost or stolen	☐	☐

Note. The LTE is copyright, and any study reports, papers or outputs using it should fully cite either Brugha & Conroy, (1985), or Brugha & Cragg (1990).

About Your Personal Wellbeing

We would like to know how your health has been in general over the last 4 weeks. Please consider the last 4 weeks and answer the following questions by placing a clear '**X**' in one box for each question.

NOTE:
This questionnaire is included on page 337 of the print copy of the thesis held in the University of Adelaide Library.

About Your Child's Family Background

1. What is the age of the child's mother (or parental mother figure)? (Leave blank if unsure)

☐☐ years

2. What is the mother's (or parental mother figure's) highest completed level of schooling?

- ☐ Primary school
- ☐ Some years of high school
- ☐ Year 12, Matric or equivalent
- ☐ Technical, trade or TAFE certificate, or some university
- ☐ Completed university qualifications
- ☐ Don't know

3. Is the mother (or parental mother figure) currently in paid employment?

- ☐ No
- ☐ Yes, Part Time
- ☐ Yes, Full Time
- ☐ Don't know

4. What is the age of the child's father (or parental father figure)? (Leave blank if unsure)

☐☐ years

5. What is the father's (or parental father figure's) highest completed level of schooling?

- ☐ Primary school
- ☐ Some years of high school
- ☐ Year 12, Matric or equivalent
- ☐ Technical, trade or TAFE certificate, or some university
- ☐ Completed university qualifications
- ☐ Don't know

6. Is the father (or parental father figure) currently in paid employment?

No	☐
Yes, Part Time	☐
Yes, Full Time	☐
Don't know	☐

7. Does your family receive any pension or benefit?

No ☐

Yes ☐

If YES please specify: ☐

8. Which of the following best describes the parents (or parental figures) *currently* living in the child's household?

Two natural (biological or adoptive) parents	☐
Mother and stepfather/defacto	☐
Father and stepmother/defacto	☐
Mother alone	☐
Father alone	☐
Other	☐

If OTHER please specify: ☐

Parent version

This section asks questions about your child's behaviours and feelings towards school (or preschool if they have not started school yet). Using the scale below, please put a clear '**X**' in the box that best describes your child for each item.

For each item, please place an '**X**' in one box		Almost Never	Not much	Sometimes	A lot	Almost Always
1.	Makes up reasons to stay home from school	☐	☐	☐	☐	☐
2.	Seems to dread going to school	☐	☐	☐	☐	☐
3.	Becomes upset when it's time to go to school in the morning	☐	☐	☐	☐	☐
4.	Asks to stay home from school	☐	☐	☐	☐	☐
5.	Complains about going to school	☐	☐	☐	☐	☐

Teacher version

This section asks questions about the study child's behaviours and feelings towards school (or preschool if they have not started school yet). Using the scale below, please put a clear '**X**' in the box that best describes the study child for each item.

For each item, please place an '**X**' in one box		Doesn't apply	Sometimes applies	Certainly applies
1.	Makes up reasons to go home from school	☐	☐	☐
2.	Asks to go to the sick room	☐	☐	☐
3.	Complains about school	☐	☐	☐
4.	Feigns illness at school	☐	☐	☐
5.	Asks to leave the classroom	☐	☐	☐
6.	Asks how long it is until it is time to go home	☐	☐	☐

RAPS items from Wellborn's (1991) dissertation

NOTE:
This questionnaire is included on page 341 of the print copy of the thesis held in the University of Adelaide Library.

RAPS items from Skinner et al's (2009) current engagement research

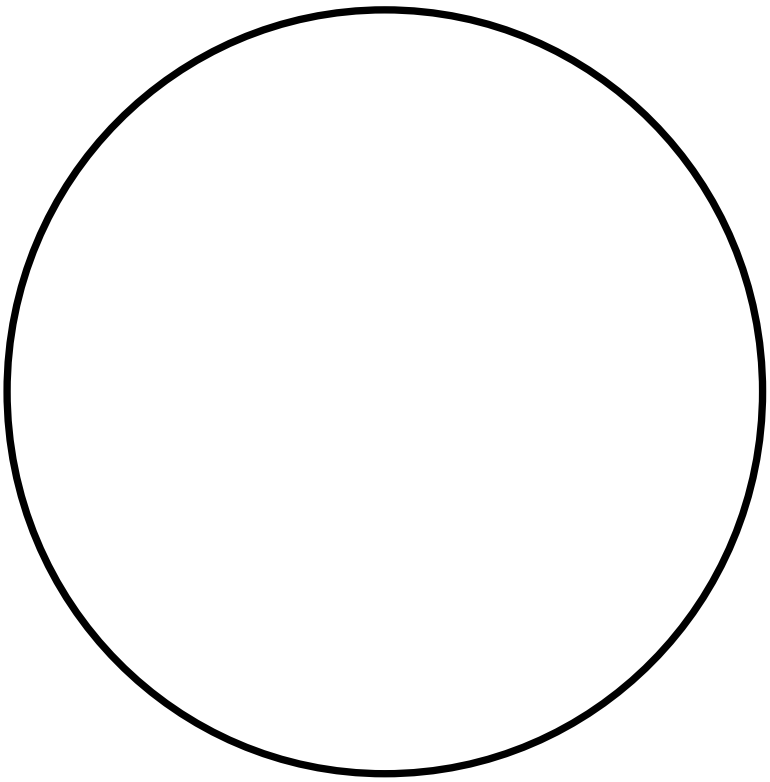
	Not At All True	Not Very True	Sort Of True	Very True
When we start something new in class, this student…				
1. participates in discussions	1	2	3	4
2. doesn't pay attention	1	2	3	4
3. is enthusiastic	1	2	3	4
4. thinks about other things	1	2	3	4
5. seems restless	1	2	3	4
In my class, this student…				
1. works as hard as he/she can	1	2	3	4
2. does just enough to get by	1	2	3	4
3. seems interested	1	2	3	4
4. is anxious	1	2	3	4
5. is angry	1	2	3	4
6. does more than is required	1	2	3	4
7. seems unhappy	1	2	3	4
8. comes unprepared	1	2	3	4
When working on classwork in my class, this student…				
1. appears worried	1	2	3	4
2. seems to feel good	1	2	3	4
3. appears frustrated	1	2	3	4
4. appears involved	1	2	3	4
5. seems uninterested	1	2	3	4
When I explain new material, this student…				
1. doesn't seem to care	1	2	3	4
2. listens carefully	1	2	3	4
When faced with a difficult problem or assignment in my class, this student…				
1. "attacks" it	1	2	3	4
2. gives up quickly	1	2	3	4
3. becomes frustrated	1	2	3	4
4. doesn't even try	1	2	3	4
5. gets angry	1	2	3	4
6. just keeps trying	1	2	3	4
When this student doesn't do well on a test or assignment in class, he/she…				
1. feels terrible	1	2	3	4
2. bounces back	1	2	3	4
3. is devastated	1	2	3	4
4. gets angry	1	2	3	4
5. gets depressed	1	2	3	4
6. works harder the next time	1	2	3	4

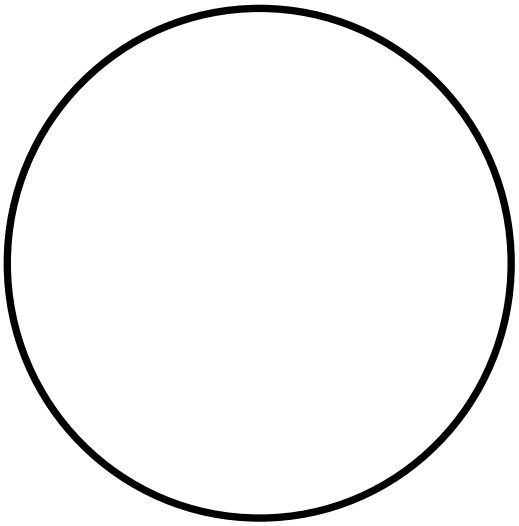
Note. This questionnaire can be found at www.pdx.edu/psy/ellen-skinner-phd-professor-human-development-and-psychology-associate-chair-department-psychology-1

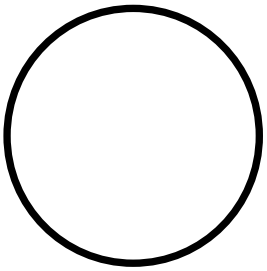
About the Study Child's Behaviour and Wellbeing

Please place an '**X'** in the box that best describes the child's behaviour. Please answer on the basis of this child's behaviour across classroom activities in general, **over the last 6 months or this school year**.

For each item, please place an **'X**' in one box **In class, this student…**	**Never**	**Rarely**	**Sometimes**	**Usually**	**Always**
1. Participates actively in discussions	☐	☐	☐	☐	☐
2. Appears interested	☐	☐	☐	☐	☐
3. Pays attention	☐	☐	☐	☐	☐
4. Does more than required	☐	☐	☐	☐	☐
5. Prefers activities which he/she already knows how to do	☐	☐	☐	☐	☐
6. Appears frustrated	☐	☐	☐	☐	☐
7. Loses/misplaces his/her belongings	☐	☐	☐	☐	☐
8. Concentrates on doing his/her work	☐	☐	☐	☐	☐
9. Appears enthusiastic	☐	☐	☐	☐	☐
10. Depends on me to make decisions regarding his/her work	☐	☐	☐	☐	☐
11. Listens carefully	☐	☐	☐	☐	☐
12. Appears bored	☐	☐	☐	☐	☐
13. Appears happy	☐	☐	☐	☐	☐
14. Does just enough to get by	☐	☐	☐	☐	☐
15. Tries hard	☐	☐	☐	☐	☐
16. Appears angry	☐	☐	☐	☐	☐
17. Sticks with difficult tasks	☐	☐	☐	☐	☐
18. Prefers doing activities that are easy for him/her	☐	☐	☐	☐	☐
9. Is unwilling to change his/her approach to solving problems, even when it isn't working	☐	☐	☐	☐	☐
20. Appears worried	☐	☐	☐	☐	☐
21. Likes to figure things out for him/herself	☐	☐	☐	☐	☐
22. Appears sad	☐	☐	☐	☐	☐
23. Does the best that he/she can	☐	☐	☐	☐	☐
24. Copes positively (tries harder the next time) when he/she doesn't do well on a task	☐	☐	☐	☐	☐







I'm asking kids in your classroom questions about how they feel when they're doing work in class. Can I ask you some questions? I have some pictures that can help you answer.

First, I'll show you how the pictures work.
Here are 4 circles. This circle is very small (*circle 1*), this one is a bit bigger (*circle 2*), this one is even bigger (*circle 3*), and this circle is the biggest (*circle 4*). When I go like this (*point across from child's left to right*) the circles just get bigger and bigger. So on this picture, this (*circle 4*) means more than this (*circle 2*), doesn't it? Do you understand? (*Check child responds affirmatively*)

Now, you can put this on a circle to answer my questions (*give child the sticky counter*).

Here are some questions to practice on.

Example 1
So if I asked you '**How often do you wear your pants on your head**?' – would you say '**never'** (*point to 1*) and put it on the smallest one, here?, would you say '**sometimes'** (*point to 2*) which is a bit more, so you'd put it here, wearing your pants on your head '**lots of the time'** (*point to 3*), that's even more, isn't it, so you'd put it here, or if you wore your pants on your head '**all of the time'** (*point to 4*)**,** you'd put it here, coz that's the most you can do it, right?

Where does the counter go for you? (*Check for response*).

Now that was a silly question, wasn't it, because you never wear your pants on your head!! So you'd put it on '**never'**, wouldn't you? (*Point to '***never'** *to show the child*)

What if you did wear your pants on your head sometimes?? Where would you put it????
(*Check child selects a middle response*).

If correct, 'yes, that's right, you'd put it on (*child's response* - '**sometimes/lots of the time')**
If incorrect, 'If you wore your pants on your head sometimes, you'd put it on the '**sometimes'** circle (*circle 2*), wouldn't you? (*Check for a nod or a yes*)

Give child personal and specific praise: 'That's very good eye contact/listening (*child's name*)'
If child does not show eye contact or listening skills at this point, wait until this is observed during another example question before saying this.

Review scale – so this is '**never'** *(point to 1)*, this is '**sometimes'**, *(point to 2)* this is '**lots of the time'** *(point to 3)*, and this is '**all of the time**' *(point to 4)*.

Example 2

Now, if I asked you **'How often do you wear shoes to school**?' would you say '**never'**, '**sometimes'**, '**lots of the time'**, or '**all of the time'**?
*Check child responds to '***all of the time'** *(4).*
If correct, 'That's right, you wear your shoes to school all of the time, which is this circle, otherwise you might step on something and hurt yourself'
If incorrect, 'Are you sure? Every day that you come to school in the morning, you wear your shoes to school, don't you? So you wear your shoes to school '**all of the time'**, which is this one (*point to 4*)

Example 3

And how often do you wear a jumper? '**never'**, '**sometimes'**, '**lots of the time'**, or '**all of the time'**? *Check child chooses a middle response – NOT 'never' or 'all of the time'.*
If correct, go 'yes, that's right, you do wear a jumper (*child's response* – '**sometimes/lots of the time**'), but sometimes you don't, when it's hot outside. You've got the idea of this game!'
If never, go 'You never wear a jumper? But you sometimes wear a jumper in winter, when it's really cold, don't you? So sometimes when it's hot you don't, but sometimes, when it's cold, you do. So you wouldn't wear it '**never'** (*point to 4*), you wear it '**sometimes**' (*point to 2*) or '**lots of the time'** (*point to 3*)
If always, go 'You always wear a jumper? (But you're not wearing a jumper now – **ONLY** if child is not wearing a jumper), or what about when it's really hot and you're at the beach, you don't wear a jumper then do you? So you wouldn't wear it '**always'** (*point to 4*), you wear it '**sometimes**' (*point to 2*) or '**lots of the time'** (*point to 3*), when it's cold outside.

If kids understand, move to proper questions. If not, review scale and examples.

Proper questions

You're doing very well at this activity. Now I have 7 questions for you, so I need you to listen carefully and answer my questions, and then if you're a good helper, then you'll get a sticker. OK? If you want me to explain anything better, just tell me, OK?

I'm going to ask you how you feel when you're doing work in the classroom. Can you think about doing work in the classroom for me? (Wait for a yes, nod, or some affirmative indication) Do you do maths work in the classroom? Do you do writing work in the classroom? What classroom work do you like doing? Is there any work that you don't like? Do you ever sit at your desk and do work?

(this small chat is to orientate the child to thinking about doing work in the classroom, so child's answers will be more likely to relate to this situation, rather than an irrelevant one – e.g. with mum). Acknowledge some of the child's answers, e.g. 'OK',' really', 'that's good', 'yes, drawing is really fun, isn't it?' But ***be brief*** *in doing this)*

I'm also going to ask you about feelings that kids have. These are feelings like happy, sad, worried, bored, and excited. Everyone feels worried about something. What makes you feel worried? (Check child understands concept – answer makes sense e.g. 'when I think mum is going to yell at me'. If child cannot provide an answer, or if answer clearly does not reflect the emotion (e.g. 'When mum gives me nice presents'), then say ' ***(emotion – e.g. worried) is like…(definition)'.*** *Most kids get excited about something. What makes you excited?(Follow same procedure as for worried). Lots of kids feel bored sometimes? When do you feel bored? (Follow same procedure as for worried)*

Now I'm going to ask you how you feel when you're doing work in the classroom.

1. When you're doing work in the classroom, how often do you feel happy? Do you feel happy '**never'** (*point to 1*), '**sometimes'** (*point to 2*), '**lots of the time'** (*point to 3*), or '**all of the time'** (*point to 4*)?

   So you're happy (*child's response*) when you're doing work in the classroom? (*Check for affirmative response. If anything suggests otherwise – child shakes head, looks concerned, hesitates, say* ***'Is that right, or do you want to put it somewhere else?****' Make sure your voice does not convey to the child that the 'correct' thing to do is to change the response*.)

   Why are you happy (*child's response*)? (*If child's answer indicates that he/she is thinking about wrong context, and not when working in the classroom, e.g. 'because my mum is nice and she buys me things', firstly acknowledge child's answer '****OK'****, then re-orientate child '****But how about when you're doing work in the classroom, do you feel happy then?****', and if the child does not automatically respond, then repeat the scale responses*.)

2. When you're doing work in the classroom, how often do you feel mad? Do you feel mad '**never'** (*point to 1*), '**sometimes'** (*point to 2*), '**lots of the time'** (*point to 3*), or '**all of the time'** (*point to 4*)?

So you're mad (*child's response*) when you're doing work in the classroom? (*Check for affirmative response*) Why are you mad (*child's response*)?

3. When you're doing work in the classroom, how often do you feel excited? Do you feel excited '**never'** (*point to 1*), '**sometimes'** (*point to 2*), '**lots of the time'** (*point to 3*), or '**all of the time'** (*point to 4*)?

So you're excited (*child's response*) when you're doing work in the classroom? (*Check for affirmative response*) Why are you excited (*child's response*)?

4. When you're doing work in the classroom, how often do you feel sad? Do you feel sad '**never'** (*point to 1*), '**sometimes'** (*point to 2*), '**lots of the time'** (*point to 3*), or '**all of the time'** (*point to 4*)?

So you're sad (*child's response*) when you're doing work in the classroom? (*Check for affirmative response*) Why are you sad (*child's response*)?

5. When you're doing work in the classroom, how often do you feel bored? Do you feel bored '**never'** (*point to 1*), '**sometimes'** (*point to 2*), '**lots of the time'** (*point to 3*), or '**all of the time'** (*point to 4*)?

So you're bored (*child's response*) when you're doing work in the classroom? (*Check for affirmative response*) Why are you bored (*child's response*)?

6. When you're doing work in the classroom, how often do you feel worried? Do you feel worried '**never'** (*point to 1*), '**sometimes'** (*point to 2*), '**lots of the time'** (*point to 3*), or '**all of the time'** (*point to 4*)?

So you're worried (*child's response*) when you're doing work in the classroom? (*Check for affirmative response*) Why are you worried (*child's response*)?

7. When you're doing work in the classroom, how often is work fun? Is work '**never'** (*point to 1*) fun, '**sometimes'** (*point to 2)* fun, fun '**lots of the time'** (*point to 3*), or fun '**all of the time**' (*point to 4*)?

So work is fun (*child's response*)? (*Check for affirmative response*)

We're all done! Thanks so much for talking to me, you gave me lots of good answers. and I give all of my good helpers a sticker. So here you go!
Now, when you go back to your class, can you send (*next child*) out here for me?

End of Interview

Re-organise materials for next child, and take a moment to write notes, while waiting for next child

General pointers:

- Make sure there is lots of eye contact, and keep your facial expression friendly and interested – engage the child in the interview.
- Read with an even tone – do not place undue emphasis on different response options
- For every question, clarify children's responses – 'so you're always happy when you do work at school?' Ensure children respond affirmatively (e.g. nod, say 'yes')
- When clarifying and asking 'why?', do not convey in voice that answer may be 'wrong'/abnormal; you are purely checking that is what the child meant
- While being acutely aware of the need to get through interviews quickly, and not letting children become excessively distracted from the task at hand, keep the interview at the child's pace – going slowly for a child that understands straight away may frustrate him/her, and going too fast for a child that needs more thinking time may 'lose' the child.
- Allow them to have short periods of distraction – children sometimes do like answering 'why' questions, or will go off on tangents – allow them to momentarily be distracted by this if it seems they want to be, but bring them back shortly. Don't allow every 'why?' to be a distraction, or we will run out of time. The appropriate balance between keeping interviews as quick as possible, and allowing children to be distracted, will ensure children can stay on track and focus without getting too bored and restless.
- Verbally explain scale for every example question, and point to scale points while saying response options. If children are then happy to respond to the proper questions without hearing response options – i.e. they will respond (and in a way that shows they understand the scale) before you have a chance to recap each response option - then let them, but if children hesitate or don't attempt to answer prior to hearing responses, then quickly repeat them after every question – 'Is it never, sometimes, lots of the time, or all of the time?'.
- Listen to kids – acknowledge their conversation, 'why' answers etc., yet keep all conversation not directly relevant to questions at a minimum

Contingencies:

- IF AT ANY POINT, THE CHILD ASKS TO STOP, OR IS CLEARLY DISTRESSED (but not bored or fidgety): Give the opportunity to terminate the interview. 'Do you want to finish now?' If 'yes', 'OK, thank you for helping me, here is a sticker for being so good'
- If child chooses a response between numbers (e.g. the space between circles): Say to the child 'Sometimes we do feel in between, don't we? But if you had to choose one of these (point clearly to each circle, and say response at same time) which one would you pick?' If child still chooses an intermediate response, record this as such (e.g. 2.5 for between 'sometimes' and 'lots of the time' – only ever as a ½, don't need to be more accurate e.g. 1/3)

- If child is clearly being silly with his/her answers (e.g. picks extreme/intuitively opposite answers, then giggles): 'Now is that your real answer, or your silly answer? I need you to be a good helper and give me your real answers, OK? I can only give stickers to good helpers'
- If child is not paying attention/looking elsewhere: Use your hands to get child's attention – tap on table top or wave hands to catch child's attention, then direct hands to either the pictures, or your eyes, and say 'I need you to be a good helper and look at...' or 'can I have your eyes here please?'
- If child is strongly and chronically not paying attention: (1) first tell directly, 'now I need you to sit still and listen carefully for (x) more questions, and then we'll have a break and you'll get a sticker, but you need to be a good helper, OK?'(2) take a short break, perhaps do some exercises, or blow some bubbles. Only break for as long as is necessary. If this doesn't work, FOR A LAST RESORT ONLY, say (3) 'If you like, we can stop for a while, then you can come back later and finish so that you can get your sticker, OK?' ONLY if continuing would result in poor quality info as the child is clearly not listening and/or responding correctly, or if the child really cannot stay doing the task, as is too restless or distressed etc. If this happens and the child does not come back, make sure they still get their stickers at the end of the day.
- If child seems confused: 'Do you understand? Do you want me to explain it again?'
- If child clearly does not understand emotion or asks what it means: Give standard example of emotion – listed below
- If child wants another sticker: 'You can only have that one for now because I have some more questions to ask you first, but if you're a very good helper and answer those questions, then I'll give you another sticker at the end'
- If child consistently gets examples 'wrong': Review scale and description of pictures, review example questions, but answer the first one yourself – E.g. How often do you wear a hat outside at school? 'you'd say always, because every time you go outside at school, your teacher makes you put your hat on, doesn't she? You always have to wear it outside – every time'. Ask child to respond for never, always and a middle response for each question - 'What if you *sometimes* wore a hat outside, but sometimes your teacher let you go outside without a hat?', then 'What if you *never* wore a hat outside, because your teacher didn't care?" –, and de-brief after each response – that's right, if you sometimes go outside without a hat, you'd point there.
- If child elaborates on 'why' questions: Allow the child to be momentarily distracted – moving along before the child is ready to may convey this is a chore, and possibly result in the child becoming bored. It will do the child good to momentarily talk about what he/she wants – but keep it brief, and don't allow the child to 'chat' for every why – listen, acknowledge answers 'really' 'yes, sometimes mums do get angry, don't they?' but don't continue the conversation yourself, and bring the child back to the task at hand as soon as you can. If needs be, be firm and say, 'now we have to do some more questions, OK? We've got (*x)* more of these to go' and say question.
- If child's 'why' answer is the wrong context i.e. does not relate to doing class work e.g. 'because my mum loves me': Say 'OK'. But how about when you're doing work in the classroom, do you feel happy then?' and repeat the scale responses if child does not automatically respond.

- If child wants to change an answer, or looks like he/she wants to change an answer when you repeat answer back: if the child wants, he/she is allowed to change his/her answer. Don't encourage or 'lead' child to change, but if child shakes head, says no, or otherwise indicates with facials/body language that he/she is not happy with the original answer, then offer the opportunity by saying 'Is that right? Do you want to put it somewhere different?' and if you get an indication of 'yes', then repeat the scale along with the item ('This is never sad, this is sometimes sad, this is sad lots of the time, and this is sad all of the time'.) If the child selects a response as you say it, try to finish the whole scale, but if the child is adamant, then just re-iterate 'So you're sad (*child's response*) when you're doing work?' and if the child is happy with this, then record this response only, and not their original response.
- If child can't give you an example of when he/she is bored, worried, excited: That's OK. But if child can't give you an example, ask, 'Do you know what (worried) means?' and give the standard example if child indicates 'no'. If child indicates he/she knows what it means, then continue with interview. If child hesitates and does not indicate 'yes' or 'no', or you are not sure if the child understands, give the definition.

Emotion examples:

Bored: You might feel tired or fed up when what you're doing isn't interesting or fun, and you want to do something else.

Excited: Excited is when you're really interested in something, you're really happy and you like it a lot, so your feelings are all stirred up inside you.

Worried: Worried is a bit like being upset – you might feel sad or nervous or scared, because you keep thinking about problems or bad things that might happen.

The Leuven Involvement Scale for Young Children
(LIS-YC: Laevers, 1997)

NOTE:
This appendix is included on pages 352-359 of the print copy of the thesis held in the University of Adelaide Library.

The following section asks about the study child's skills and current school progress. We are assessing this purely to ensure that other survey questions are working as intended. Please place a clear '**X**' in the box that best describes this child's progress.

	Poor/below year level	Needs improvement	Satisfactory/ at year level	Very good	Excellent/beyond year level
1. Reading	☐	☐	☐	☐	☐
2. Writing	☐	☐	☐	☐	☐
3. Maths	☐	☐	☐	☐	☐

Appendix B14 – School Risk Behaviours (i.e., Disciplinary Action, School Absence/Lateness, Classroom Absence)

This section asks questions about this child's behaviours towards school, and your responses towards the child's classroom behaviour. Using the scale below, please put a clear '**X**' in the box that best describes this child for each item.

Over the past term on average, how often has this child…	**Never**	**Rarely**	**Sometimes**	**Frequently**	**Very frequently**
1. Received in-class action (e.g. reminders or warnings, re-directing to tasks, in-class 'time out')	☐	☐	☐	☐	☐
2. Received out-of-class action (e.g. removal to 'buddy class', chat to principal, 'time out')	☐	☐	☐	☐	☐
3. Received out-of-school action (e.g. take home agreement, modified attendance)	☐	☐	☐	☐	☐
4. Been absent from class (e.g. returned late from recess/lunch, left class with little/no reason, took toilet breaks that were excessive in number/duration)	☐	☐	☐	☐	☐
5. Been absent (*explained*) from school	☐	☐	☐	☐	☐
6. Been absent (*unexplained*) from school	☐	☐	☐	☐	☐
7. Been late (*unexplained*) to school	☐	☐	☐	☐	☐

Wave 1 Parent Survey

1. What is the gender of the child in this study?

   Male ☐ Female ☐

2. What is the age of the child in this study? (e.g. 0 | 4 years 1 | 0 months)

   ☐| years, ☐| months.

3. Is your child of Aboriginal or Torres Strait Islander origin?

   No ☐
   Yes, Aboriginal ☐
   Yes, Torres Strait Islander ☐

4. Which of the following best describes your relationship to the child in this study?

   Natural (biological or adoptive) mother ☐
   Natural (biological or adoptive) father ☐
   Stepmother ☐
   Stepfather ☐
   Other ☐

   If OTHER please specify: ☐

Wave 1 Teacher Survey

1. How long has the study child been attending your preschool? Please write the number of months to the nearest month (e.g. 0 | 6 months).

   ☐| months

2. What is the age of the child in this study? (e.g. 0 4 years 1 0 months).

   ☐☐ years, ☐☐ months.

3. What is the gender of the child in this study?

   Male ☐ Female ☐

Wave 2 Parent Survey

1. Which school/preschool is your child currently attending?

   ☐

2. Including this School Term, how many School Terms has your child been at Primary School?

   ☐ Terms

3. Does your child have a 'school card' (a card that reduces the cost of school fees)?

   No ☐

   Yes ☐

4. Which of the following best describes your relationship to the child in this study?

   Natural (biological or adoptive) mother ☐

   Natural (biological or adoptive) father ☐

   Stepmother ☐

   Stepfather ☐

   Other ☐

   If OTHER please specify: ☐

Wave 2 Teacher Survey

1. Which school/preschool is the study child currently attending?

2. Including this School Term, how many Terms has the study child been attending this school/preschool?

☐ Terms

3. What is the age of the child in this study? (e.g. 0 5 years 1 0 months).

☐☐ years, ☐☐ months.

4. What is the Date of Birth of the child in this study? (e.g. 0 5 (Day) 1 0 (Month) 0 1 (Year))

☐☐ Day ☐☐ Month ☐☐ Year

Wave 3 Teacher Survey

1. Which year level is the study child currently in?

Reception ☐ Year 1 ☐

2. What is the age of the child in this study? (e.g. 0 6 years 1 0 months).

☐☐ years, ☐☐ months.

APPENDIX C

PARTICIPANT CORRESPONDENCE†

† All paper-based correspondence is displayed here in a smaller font size than when it was administered to parents and teachers, to enable it to fit within thesis page margins

Healthy Minds/Healthy Futures: Child Resilience Study

Guidelines for Participating Preschool Sites and Teachers

The present project aims to identify characteristics of resilient children, and factors which help children cope with the adverse effects of facing difficult life situations. The project involves 3 assessments of children: one when the child is in preschool, one in Reception, and one in Year 1. Participation in each assessment requires the completion of two questionnaires on each child – one completed by the parent who is the primary caregiver, and one completed by a teacher. This information will help parents, teachers, and health professionals to foster more effectively mental health resilience in children facing adversity. In doing so, we hope to give children the best possible start to life.

The following information includes some guidelines that will help the project run as smoothly as possible. We have also provided a 'Procedural Checklist' for you to use as you proceed through the project during Term 3. We have enclosed a hard copy of this procedural checklist as well as an electronic copy as a Word.doc file on floppy disk (PC format) for you so that you can copy and paste the names and birth-dates of your enrolled children from your existing 'child checklist' into this procedural checklist. (We can email this checklist to people who have Apple Mac computers.)

A notice informing parents/guardians about the study, suitable for a preschool newsletter, has been provided. If you have not already done so, please include this in your next preschool newsletter.

We have put together a set of information pamphlets that need to be given to parents of all children attending sessional preschool at your site. These pamphlets include a "Letter of Introduction", "Study Information Sheet", "Helpful Organisations List", and "Consent Forms for parents/guardians". Please distribute these pamphlets during weeks 1 and 2 of Term 3 (24th July to 4th August).

Parents/guardians are asked to return a signed purple consent form giving consent to their child being involved in Healthy Minds/Healthy Futures (the pamphlets also include a white copy of the consent form that parents should keep for their own records). Alternatively, parents can personally tell you or return a form informing you that they do not want their child to take part in the study. If a parent decides that they do not want to participate in the study, it is very helpful to us if you can find out the reason why they do not want to be involved. This information helps us to identify in what ways the final sample of participants are not representative of the whole available population of preschool children in the SSV district.

It is important that you let us know how many children are enrolled in sessional preschool at your site in Term 3. This information allows us to determine our response rates (the percentage of children eligible for the study that participated), and gives us an indicator of how representative our sample is of the whole available population of the preschool children in the district. It is possible that not all children enrolled at your preschool will end up being eligible for the study. Children not attending sessional preschool will be excluded from the study (e.g., occasional care, pre-entry). Other children may end up being deemed ineligible for the study because of very poor attendance, or because the parents never actually received the information pamphlets about the study. Please record this information of the procedural checklist where appropriate.

Once written consent is obtained from parents, teachers provide parents/caregivers with a copy of the yellow parent/care-giver questionnaire which we have provided in an envelope labelled 'Confidential' and 'Do Not Bend'. Some preschools last year found that setting up a table near the door so that they could hand-out and collect consent forms and surveys helped them to catch parents as they come and go.

If parents request help to complete the survey (e.g., would prefer to do it as a telephone or face-to-face interview), contact us and we will arrange this.

Parents are asked to return the completed questionnaire in the sealed envelope to a teacher. If the envelope isn't sealed, seal it in front of them so that they can be assured of their confidentiality. Teachers

should place them in a box stored safely in an office. Consecutively write a number (1,2,3,etc) on the envelope of each survey as you put them in the box (this helps keep track of them and helps make sure none go missing). The Procedural Checklist including the children's names should be located near the box for teachers to tick-off who has returned their survey and to record the 'date of return' next to each child's name. This checklist will help teachers know which parents are yet to return their questionnaires, and thus who to remind. On this list, also tick off and date when teacher questionnaires are completed.

As a token of our appreciation, children whose parents return a completed survey will be entered into a raffle draw to win one of four $50 'Toys-R-Us' gift vouchers.

The yellow "Thankyou/Reminder Notes" should be sent home to parents/caregivers who have not returned consent forms or questionnaires by Week 4 of the term (14th-18th August). Where needed, these reminder notes can be distributed again in Week 6 (28th Aug-1st Sept) and in Week 8 (11th-15th Sept). These thankyou/reminder notices are designed to be suitable to give to all parents, except those who have directly indicated that they refuse to participate in the study.

Study information pamphlets and the questionnaire may be placed in the children's preschool bags for those parents/guardians whose children catch buses. Questionnaires may also be returned in the same manner. Don't worry too much if the surveys get a bit bent – the main thing is that they don't get folded in half (as this stops them from being able to feed through our data scanner).

Teachers may begin to complete the green teacher questionnaires only AFTER parents have signed and returned a consent form indicating that they are willing for their child to be involved in the study. You will have until the beginning of Term 4 to complete the questionnaires for each child, but we recommend getting started as early as you can. For new children who enrolled in preschool at the beginning of Term 3, you will need to wait until Week 5 of Term 3 (21st August) before completing surveys on these children, in order to allow you some time to get to know them.

If a parent signs the consent form indicating she/he is willing to participate in the study, but does not end up returning a completed parent questionnaire, teachers can still complete the teacher questionnaire on that child.

It is advised that preschools with more than one teacher divide the children between teachers according to which teacher "knows each child best". Equally dividing the children between teachers will ease the load. Directors, Teachers, and ECW's are all appropriate people to complete the teacher questionnaire. However, because of their job description, ECW's can volunteer to complete surveys, but cannot be required to do so by their Director.

It is estimated that the questionnaire will take teachers approximately 10 minutes to complete for each child. The first few surveys you complete may take approximately 10-15 minutes, but as you become more familiar with the questions and have set a benchmark for where you expect children to fit, the time per questionnaire will lessen to as little as 5-10 minutes. Previous experience tells us that doing a batch of questionnaires in each sitting speeds up the process (because it is easier to 'get on a roll').

At the end of Term 3, box up all of the completed parent and teacher questionnaires, along with the signed consent forms and your preschool's "procedural checklist", and send them through internal courier to Dr Lauren Miller-Lewis, Post-Doctoral Research Fellow, at DECS Southern Sea and Vines District Office, 5th Floor Noarlunga House, Noarlunga Centre, 5168. Mark the front of the box/package with "Healthy Minds/Healthy Futures" and "Do Not Bend", and put a return address on the back. Lauren will then take the completed surveys to the Research and Evaluation Unit (CYWHS) for data scanning and data analyses.Your preschool has generously supported the Healthy Minds/Healthy Futures project in previous years. This year, we are fortunate enough to be able to financially contribute to the time teachers devote to this project. Our project budget enables us to pay preschools $6.00 for every teacher-reported survey that is completed in Term 3 of 2006. Once we know how many of your enrolled children you have parental consent to complete teacher surveys on, Lauren will contact you to arrange for the appropriate reimbursement to be paid to your preschool. (Please note that teacher-reported surveys can only be completed for children whose parents have returned a signed consent form indicating that they are willing for their child to be involved in Healthy Minds/Healthy Futures). The decision on what

preschool sites use this money for will be left up to the discretion of the preschool site director (e.g., for teacher relief time, overtime, etc). We hope that the provision of this repayment for time will compensate for the burden placed on preschool staff as a result of being involved in this project. Furthermore, the learning involved with completing the questionnaires can be counted towards teachers and directors 37.5 hours of professional development, but directors need to decide how much of it is learning (i.e. was it the first 10 questionnaires before it became more routine?).

For further information or clarification, please feel free to contact your research support person, Project Manager/Research Fellow Dr Lauren Miller-Lewis (at CYWHS 08-81616910; or DECS SSV district office 08-82073637), or SSV Early Years Learning Band Coordinator Jillian Jordan (08-82073770).

Thank-you very much for your help with and support of this important research.

Healthy Minds Healthy Futures: Child Resilience Study

Helping children develop 'resilience' (the ability to bounce back after tough times) is important for their success in later life. (***insert Preschool name here***) is taking part in an important study examining the resilience and wellbeing of young children in South Australia. The study is being conducted by the Women's and Children's Hospital in conjunction with the Department of Education and Children's Services and will provide new information about promoting resilience and wellbeing in young children. This information will be used to provide more effective programs to help foster the development of resilience in young children.

All parents with a child enrolled at (***insert Preschool name here***) will be asked to complete a questionnaire describing their children's mental health and wellbeing, behaviour, relationships, and life experiences. Teachers will also be asked to provide information about children's behaviour at kindergarten.

All information will be treated as completely confidential and we would be very grateful if you would agree to take part in the study, commencing at the beginning of Term 3 2006. However, if you do not wish to be contacted about the study would you please let (***insert name of Preschool director here***) know.

Government of South Australia
Children, Youth and Women's Health Service

Women's & Children's Hospital

Government of South Australia
Department of Education and Children's Services

Healthy Minds/Healthy Futures:

Child Resilience Study

Dear Parent/Guardian

Helping young children develop 'resilience' (the ability to bounce back after tough times) is important for their wellbeing and success in life. Staff at the Women's and Children's Hospital, in collaboration with staff from the Department of Education and Children's Services, are conducting a new study which will provide important information about promoting resilience and wellbeing in young children. This information will enable us to provide more effective programs to help foster the development of resilience in young children.

We are asking parents of children attending preschools in your district who are aged approximately 4 years to take part in this study. If you agree to take part, we will ask you to complete a questionnaire describing your child's mental health, behaviour, relationships, and life experiences. We will also ask you to complete this questionnaire when your child is approximately 5 years old and again at 6 years old. This will enable us to follow the development of participating children. The questionnaire takes about 30 minutes to complete. In order that the results are truly representative of all young children in preschool, it is important that as many families as possible take part in the study. *Regardless* of whether your child is experiencing any difficulties, we would be grateful if you would participate, so that we can get an accurate picture of all young children.

If you are willing to take part in the study please sign and return your purple consent form to your child's preschool teacher. Your child's teachers will then give you a questionnaire to complete. Once you have completed the questionnaire, we ask you to place it into the enclosed envelope, seal it, and return it to the box provided at your child's preschool. We will also seek your permission to allow your child's teacher to complete a brief questionnaire describing children's behaviour.

Please be assured that the information you provide will be treated in the strictest confidence. If you do not wish to take part in the study, please let your child's preschool teacher know.

An information sheet is included which provides some more details about the study. If you have any further questions please feel free to contact Professor Michael Sawyer or Dr Lauren Miller-Lewis at the Women's and Children's Hospital (8161-7207).

Thank you for helping us to learn better ways of increasing resilience in children.

Yours sincerely

Professor Michael Sawyer
Director
Research & Evaluation Unit
Women's and Children's Hospital

Dr Lauren Miller-Lewis
Project Manager & Post-doctoral Research Fellow
Research & Evaluation Unit
Women's and Children's Hospital

Government of South Australia
Children, Youth and Women's Health Service

Women's & Children's Hospital

Government of South Australia
Department of Education and Children's Services

Healthy Minds/Healthy Futures:

Child Resilience Study

STUDY INFORMATION SHEET FOR PARENTS/GUARDIANS

Helping young children develop 'resilience' (the ability to bounce back and cope after difficult life circumstances and tough times) is important for their wellbeing and later success in life. Staff at the Women's and Children's Hospital and the Department of Education and Children's Services (DECS) are conducting a new study which will provide important information about how we can influence and promote resilience and wellbeing in young children. It is very important that we learn more about these issues in the hope that we can create better ways of helping young children develop resilience and strong mental health.

The parent/guardian who is the primary caregiver and the teachers of every child aged approximately 4 years who are attending preschool in the Southern Sea and Vines District of DECS are being asked to take part in this study. If you agree to take part, we will ask you to complete a questionnaire which includes questions about the study child's mental health, emotions, behaviour, and self-esteem, their life experiences, and their relationships with their parents, teachers, and peers. There are also questions asking about family-school connectedness and the wellbeing and life experiences of parents. We will also ask you to complete this questionnaire when your child is approximately 5 years old and again at 6 years old. This will enable us to follow the development of participating children. Each questionnaire takes about 30 minutes to complete. Once you have completed the first questionnaire, place it in the envelope provided, seal it, and return it to the box provided at your preschool. If you would like further clarification or assistance with completing the questionnaire, please don't hesitate to contact Dr Lauren Miller-Lewis on 8161-7207. We will also seek parental permission to allow teachers to complete a brief questionnaire describing children's behaviour. There is no direct payment to teachers or parents for being involved in this study.

We would like to stress that any information you provide in the study will be treated in the strictest confidence. Information you provide will be assigned a code instead of your name in order to prevent your data from being identified. The information gained from the study may be published, but results will be written about the whole group of participants, not about individuals – you and child will not be identified in any way. Your information will remain completely confidential except in the case of a legal requirement to pass on personal information to authorised third parties. This requirement is standard and applies to information collected both in research and non-research situations. Such breaches of confidentiality are rare; however we have an obligation to inform you of this possibility. Participating in this study is completely voluntary and participants may withdraw at any stage. If you do not wish to take part in the study, you are under no obligation to do so.

If there is any further information which you would like about the study, please contact Professor Michael Sawyer or Dr Lauren Miller-Lewis at the Women's and Children's Hospital (8161-7207).

This study has been approved by the Department of Education and Children's Services (DECS), and by the Research Ethics Committee at the Women's and Children's Hospital. If you have any questions or concerns, please feel free to contact Ms Brenda Penny, Research Secretariat on 8161-6521.

THANK YOU FOR HELPING US TO LEARN BETTER WAYS OF PROMOTING RESILIENCE IN YOUNG CHILDREN.

Healthy Minds/Healthy Futures:

Child Resilience Study

CONSENT FORM

PLEASE SIGN AND RETURN TO YOUR CHILD'S TEACHER

1. The nature and purpose of the research project has been described to me on the attached Information Sheet. I understand it, and agree to my child, myself, and my child's teacher taking part.
2. I understand that I or my child may not *directly* benefit by taking part in this study.
3. I acknowledge that the possible risks/inconveniences have been described to me as outlined in the Information Sheet (i.e, the time required to complete the questionnaire).
4. I understand that while information gained in the study may be published, I and my child will not be identified and my information will be confidential. The privacy and confidentiality of any information I provide will be safeguarded as explained in the Information Sheet.
5. I understand that I can withdraw from the study at any stage and that this will not affect any aspects of my child's relationship with the Women's and Children's Hospital or with the Department of Education and Children's Services.
6. I understand that there will be no direct payment to me or my child for taking part in this study.
7. I have had the opportunity to discuss taking part in this research project with a family member or friend.
8. I am aware that I should retain a copy of the Consent Form (attached), when completed, and the Information Sheet.

Parent's Name: _____ Parent's Signature: _____

Relationship to Child: _____ Dated: _____

Full name of Child: _____

Postal Address (for future correspondence about surveys and study results):

_____

_____

Phone Number:_____

e-mail address:_____

So that we can keep in contact with you if you move house while the study is being conducted, please provide (a) your mobile number, or (b) the name and phone number of a family member/friend who you don't live with but who will know your future whereabouts:_____

_____

_____

THIS INFORMATION WILL BE KEPT COMPLETELY CONFIDENTIAL

Healthy Minds/Healthy Futures:

Child Resilience Study

If you would prefer that your child did not take part in the Healthy Minds/Healthy Futures Child Resilience Study, please indicate this on this sheet of paper and return it to your child's preschool teacher.

I (parent's name)_____ DO NOT want

my child (child's name)_____ to participate

in the Healthy Minds/Healthy Futures Child Resilience Study.

Parent's Signature: _____ Dated: _____

Helpful Organisations

This is a guide to some resources that might help you deal with concerns about child behaviour, health, and emotional well-being, or questions about parenting you may have. These South Australian organisations have internet websites that will also provide you with access to further related websites. Phone numbers for the organisation have also been provided.

If you do not have internet access at home, free access is available from your local lending library.

Parenting SA **(http://www.parenting.sa.gov.au/)**
Head Office Phone: (08) 8303 1660
24-hour Parenting Help Line: 1300 364 100 providing telephone information, counselling and support.

Parenting SA provides parenting resources and support aimed at "helping parents be their best".

Website Features

- *Parenting SA Parenting Groups Directory:* A helpful took which helps you search for groups that can help with parenting problems.
- *Parent Easy Guides:* practical easy to follow tips on a comprehensive range of parenting issues and childhood behaviour issues eg single parenting, child safety, bedwetting, self-esteem, etc. In addition, there is also a range of Aboriginal Parent Easy Guides.
- *Links:* From here a range of links with other helpful organisations is available.

Child and Youth Health **(http://www.cyh.sa.gov.au/)**
Head Office Phone: (08) 8303 1500 (See the Telstra White Pages for Regional Offices)
24-hour Parenting Help Line: 1300 364 100 providing telephone information, counselling and support.

The Parenting and Child Health Pages provides the latest information and news on parenting and child health for parents/caregivers and professionals.

Website Features

- *Health Topics:* provides detailed information on hundreds of child issues including growth, development, emotions and behaviour.
- *Question of the week:* A parent's question of the week is answered and you can look at the answers to previous questions of the week.
- *What's New:* details recent research and developments in child research.
- *Tip of the week:* short tips about parenting and child health and behaviour.
- *Search for a health centre near you:* provides you with details of approximately 150 centres around SA.
- *Links:* from here a range of links with other helpful organisations is available.

If you have concerns specifically about your child's mental health, we recommend that you see your **Family Doctor**. He/she will be able to organise a referral to a local psychiatrist, psychologist, or mental health worker.

Alternatively, you could directly contact the **Southern Child and Adolescent Mental Health Services** (Southern CAMHS) to arrange an appointment: Noarlunga: 83261234; Seaford: 83261234; Mount Barker: 83913922; Victor Harbor: 85520600; Kangaroo Island: 85532037.

It is also important to discuss your concerns with your child's **Preschool Teacher** – this will help your child's teacher to respond sensitively and appropriately to your child's needs.

CG ID | | | | | **C ID** | | | | | **PS ID** | | | | |

Parent / Primary Care-Giver Questionnaire

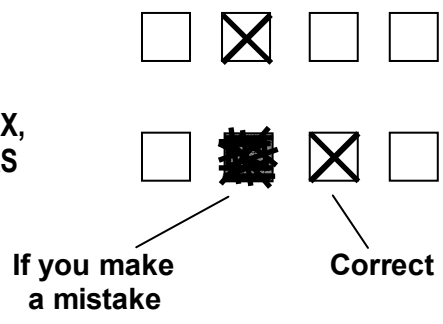
- INSTRUCTIONS -

- The questions in this booklet refer to the child in the study (i.e., the preschool child for whom you brought home this survey from preschool).
- This booklet consists of four sections asking about (a) your child's behaviour and wellbeing; (b) your relationship with your child and how you manage your child's behaviour; (c) your relationship with your child's preschool; and (d) a final section asking for some information about your child's family background, life experiences, and your own personal wellbeing.
- There are NO right or wrong answers. We are interested in your views and opinions. We would like you to answer all the questions as accurately and as honestly as you can.
- Please be assured that your responses to the questions in this booklet will be kept completely confidential.
- The pages in this booklet are double sided. Please make sure you answer the questions on both sides of the page.
- Please give one answer for each question, unless stated otherwise.
- If you find certain questions too intrusive, please leave those items blank and continue with the rest of survey.
- If you find there is no answer exactly fitting your situation, please answer with the response that fits best, and, if you like, place a comment in the margin.
- If your would prefer to complete this survey as a confidential telephone interview or a face-to-face interview, please let your child's preschool teacher know, or directly contact Dr Lauren Miller-Lewis at the Women's and Children's Hospital on (08) 8161 7207.

To answer the questions in this booklet, we ask that you carefully follow the instructions outlined below:

USING BLACK OR BLUE PEN, PLACE A CLEAR 'X' INSIDE THE BOX.

IF YOU MAKE A MISTAKE, FILL IN THE ENTIRE BOX, AND PLACE A CLEAR 'X' IN THE CORRECT BOX AS SHOWN IN THE EXAMPLE TO THE RIGHT.



T ID **C ID** **PS ID**

Teacher Questionnaire

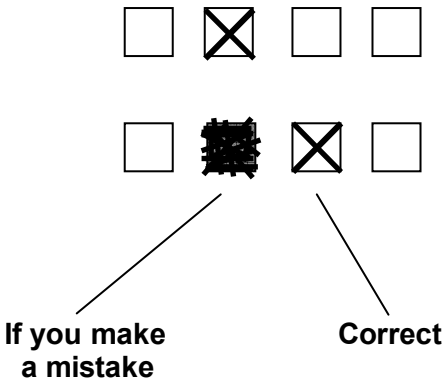
- INSTRUCTIONS -

- This booklet contains questions we would like you to answer about the 'study child' (i.e., the preschool child participating in this study that you are completing this survey booklet about).
- This booklet consists of three sections asking about (a) the study child's behaviour and wellbeing; (b) your relationship with the study child; and (c) a final section asking for some background information on you and the study child.
- There are NO right or wrong answers. We are interested in your views and opinions. We would like you to answer all the questions as accurately and as honestly as you can.
- Please be assured that your responses to the questions in this booklet will be kept completely confidential.
- The pages in this booklet are doubled sided. Please make sure you answer the questions on both sides of the page.
- Please give one answer for each question.
- If you find certain questions too intrusive, please leave those items blank and continue with the rest of the survey.
- If you find there is no answer exactly fitting your situation, please answer with the response that fits best, and, if you like, place a comment in the margin.

To answer the questions in this booklet, we ask that you carefully follow the instructions outlined below:

USING BLACK OR BLUE PEN, PLACE A CLEAR 'X' INSIDE THE BOX.

IF YOU MAKE A MISTAKE, FILL IN THE ENTIRE BOX, AND PLACE A CLEAR 'X' IN THE CORRECT BOX AS SHOWN IN THE EXAMPLE TO THE RIGHT.



Government of South Australia
Children, Youth and Women's Health Service

Women's & Children's Hospital

Government of South Australia
Department of Education and Children's Services

Healthy Minds/Healthy Futures:

Child Resilience Study

Dear Parent/Guardian,

Recently you were asked if you would take part in the "Healthy Minds/Healthy Futures" Child Resilience Study being conducted by staff at the Women's and Children's Hospital and the Department of Education and Children's Services.

- If you have completed and returned your questionnaire please accept our sincere thanks. Your time and participation is greatly appreciated. As a token of our appreciation, your child has been entered into a raffle draw to win one of four $50 'Toys-R-Us' vouchers.
- If you have provided your consent but not returned completed questionnaires, we would be most grateful if you would complete and return the questionnaire (in the envelope provided) to your child's preschool as soon as possible.
- If you have not received the questionnaire, or you have misplaced it, please ask your child's teacher for another one.
- If you have not returned the consent form, there is still enough time to complete the consent forms and questionnaires.
- If you do not want to participate in the study please indicate this on the consent form and return it to your child's teacher.

Thank-you very much for your interest, participation, time, and support in helping us promote resilience in young children. We couldn't do it without your help.

If there is any further information which you would like about the study, please contact Dr Lauren Miller-Lewis or Professor Michael Sawyer at the Women's and Children's Hospital (08-8161 7207).

Healthy Minds/Healthy Futures:

Child Resilience Study

Newsletter

VOL 1: FEBRUARY 2007

Welcome to the first annual newsletter for the Healthy Minds/Healthy Futures Child Resilience Study. Firstly, we want to thank you and your family for participating in the study last year, when your child was in preschool. The insight into childhood that you have provided so far has been immense, and is invaluable to us. We could not do this research without you and your continued support!

As you know, this study aims to gather important information about promoting resilience and wellbeing in young children. The surveys that parents and teachers completed for us in mid-2006 about the children in the study have provided us with very important information about young children's wellbeing, relationships, and life experiences. We are currently analysing the pattern of findings in this information.

Some Facts about the Children and Families Participating in the First Stage of the Study

- In 2006, 700 families of children who were attending preschool/kindergarten participated. They were from 27 different preschools located in the Southern Sea and Vines District of DECS, a district ranging from metropolitan areas such as Noarlunga, to rural areas like Goolwa, and even Kangaroo Island.
- Most of the children (80%) were aged 4 years when surveyed.
- In most cases, the child's mother completed the survey.
- Almost 1 in 5 of the children were living with a single parent.
- Most of the children (86%) had at least one brother or sister.
- Half of the mothers in the study were working as well as caring for their children.
- Over half (55%) of the families had experienced at least one difficult event in their lives during the previous 12 months. For example, 21 per cent had experienced the death of a friend or extended family member, and for 13 per cent of families, a serious illness or injury was experienced by a close family member.

Government of South Australia

Children, Youth and Women's Health Service

Women's & Children's Hospital

This study is being conducted by the Women's and Children's Hospital, the Department of Education and Children's Services (DECS), and the University of Adelaide, and is funded by the National Health and Medical Research Council, the Australian Rotary Health Research Fund, and the Channel 7 Children's Research Foundation.

You can contact the research team at:

Research & Evaluation Unit
Women's & Children's Hospital
72 King William Rd
North Adelaide
5006

Ph. (08) 8161 7207

Fax. (08) 8161 6906

What Happens Next? Stage Two of the Study

We will be contacting participating families again in July 2007. We will place a short notice in all Southern Sea and Vines District Preschool and School Newsletters to remind families that the second stage of the study is about to start.

In 2006 you collected your survey from your child's preschool teacher and returned it to the preschool. This year, at the start of Term 3 (last week of July 2007), all families who agreed to complete parent surveys on their child will be posted a questionnaire directly to their home. We will provide you with a pre-paid reply envelope for you to return your completed survey straight to us at the Women's and Children's Hospital. The 2007 parent survey will again take about 30 minutes to complete. It will ask the primary caregiver for your child to answer questions about your child's self-esteem, emotions, behaviour, and mental health, their life experiences, and their relationships with their parents, teachers, and peers. The questions are similar to those you answered in 2006. This allows us to learn how children have changed, grown, and developed over the past year. We are really looking forward to hearing how everything is going for you and your child.

In the same way as we did in 2006, we will also ask your child's teacher during Term 3 of 2007 to complete a brief survey describing your child's behaviour at preschool/school. We will organise this with your child's preschool/school (so you don't need to do anything for this part). As parents, you would be well aware that children can behave differently in different settings (e.g., home and school), and that children's behaviour can change over time. This is why it is important for us to seek your child's teacher's views on your child's behaviour at preschool and school – this way we can get a more complete picture of your child.

Your Privacy – What Happens to the Information?

Your privacy is of the upmost importance to us. The Research and Evaluation Unit at the Women's and Children's Hospital follows strict procedures to ensure your privacy is protected. All information you provide will remain entirely confidential – no names, addresses, or other identifiable information will be released. The information you provide will never be used in any way that could identify you, your child, or your family. Only the combined results from everyone in the project will be discussed and published.

The Final Stage of the study will take place in 2008, when the study children will be in Reception or Year 1 at school. At this time, parents and teachers will be asked to complete a final survey.

We sincerely hope you will continue to support this important study by taking part in the second and third stages of the study. Tracking the growth and development of children over time provides us with a more detailed picture of them, which allows us to answer more complex questions about children's development of resilience and wellbeing. In order that the results will truly represent all families, it is important that as many families as possible take part in the study, regardless of whether or not you are worried about your child's wellbeing.

Caring for 4 to 6 year-old Children: Some Tips on Helping Your Child with the Transition from Preschool to Primary School

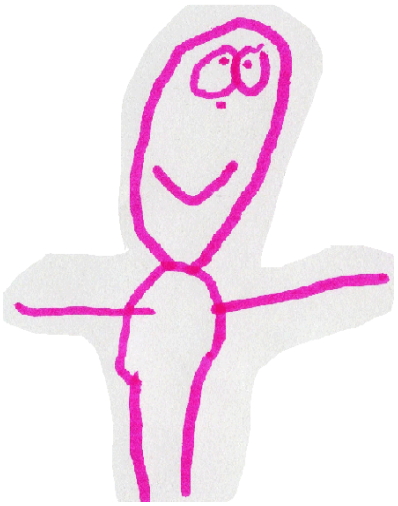
Starting school is a huge step for children and it takes time to get used to. School may be a strange and scary place for beginners. There are new rules and many new things that children are expected to do. Starting school can be stressful. Some children initially don't like to go. If this happens, listen to your child, but try not to let him/her see that you are worried. Let your child know that you believe that he/she can manage to go to school and that you will help. Ask your child what they think will help (e.g., who should drop him/her off at school, where they want to say goodbye). Having some control over what happens can help children cope with fears. Talk to your child's teacher if things don't improve.

Preparing for School:

It will help if you prepare your child as much as possible and show that you have confidence that he/she will manage the new challenges. Help your child to become familiar with school by visiting before, driving past often, and talking about what will happen. Some schools allow families to walk through the buildings and play on the equipment after school-hours when other children are not around. Make sure your child knows where the toilets are and where you will pick them up. Explain the school bell and what it means. Read your child a story about a child who just started school.

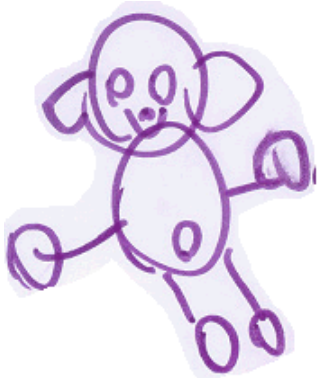
Children's Books About Starting School:

- "Into the Great Forest: A Story for Children Away from Parents for the First Time" by Irene Wineman Marcus & Paul Marcus.
- "Ramona the Pest" by Beverly Cleary.
- "The Kissing Hand" by Audrey Penn.
- "Look, There's a Hippopotamus in the Playground Eating Cake" by Hazel Edwards & Deborah Niland.



Once at School:

Do everything possible to pick your child up from school on time. Make sure your child has the opportunity to tell you all about their day. Children are often hungry after school, so a healthy snack is important. Be flexible in the early days of school. Children may be tired or grumpy until they settle-in. Don't expect too much. Children learn at different rates. You can help best by encouraging and taking an interest. Children do best at school when their parents and teachers support each other. Let your child's teacher know if anything is happening at home that might upset your child at school. Tell your child's teacher when you are pleased with what is happening at school and when you are concerned.



Information Source:

Parenting SA Parent Easy Guide 48 - www.parenting.sa.gov.au & Child and Youth Health, Starting School - www.cyh.com . These websites are a fantastic source of practical and easy to follow tips and information on a huge range of parenting issues and child health and behaviour topics. Check them out to see the full range of topics they cover.

STOP PRESS!

NEW MEDICARE REBATE – MORE AFFORDABLE MENTAL HEALTH SERVICES

If you have concerns about the mental health and wellbeing of your child or any other member of your family, we recommend that you see your family doctor/GP. If necessary, he/she will be able to organise a referral to a local psychiatrist, clinical psychologist, or other mental health worker. Recent changes to Medicare mean that services provided by clinical psychologists and mental health workers are now eligible for Medicare rebates in the same way as other specialist services. As a result, access to mental health assistance is more affordable than it has been in the past.

If You Are Moving… Please Remember to Keep in Touch!

You are unique and irreplaceable! One of our biggest challenges is keeping in touch with families who move. Please help us keep in contact with you throughout 2007 and 2008 by updating your address and contact details if you move house or change phone numbers during this time. You can do this in a number of ways:

- Phone us at the Research and Evaluation Unit on (08) 81617207.
- Email our research assistant Amelia on amelia.searle@adelaide.edu.au
- Complete the 'change-of-address' slip enclosed with this newsletter and send it to us in the pre-paid envelope provided.

THANK YOU!

Providing Feedback to Us

We have received some really positive feedback from parents who are involved in the study. Some examples include:

"I found this survey to be an interesting undertaking. It certainly makes you deeply think about your child, yourself and the way you both interact and react to each other & outside influences. I enjoyed doing it and think it has been very valuable. Thanks."

"Thank you for this survey. Putting answers down has pointed out some issues I didn't know were there. What a fantastic idea!! Thanks."

"Glad to contribute. I believe this is a very necessary and worthwhile project."

Many of the teachers also commented that completing the survey provided them with a valuable opportunity to sit and reflect on the child's progress.
If you have any feedback about being in the study that you would like to pass on, please contact us at the Research and Evaluation Unit on (08) 81617207. We'd love to hear from you.

Healthy Minds/Healthy Futures:

Child Resilience Study

CHANGE OF ADDRESS DETAILS

If your contact details have changed, please complete this slip and send it to us in the reply-paid envelope provided. Alternatively you can phone us at the Research and Evaluation Unit on (08) 81617207, or email our research assistant Amelia on amelia.searle@adelaide.edu.au.

Parent's Name: _____

Full Name of Participating Child: _____

New Postal Address:

_____

_____ Postcode_____

Ph (Home): _____Ph (Mobile): _____

e-mail address: _____

Thank you for continuing to be part of this important study.

Dr Lauren Miller-Lewis
DECS Southern Sea and Vines District Office
5th Floor, Noarlunga House
NOARLUNGA CENTRE SA 5168
R2/7

Healthy Minds/Healthy Futures:

Predicting and Promoting Mental Health Resilience in Early Childhood.

10th November, 2006.
«PrincipalDirector» - Principal
«Site_Name»
«Address»
«SUBURB» SA «Postcode»

Dear «PrincipalDirector»

RE: "Healthy Minds/Healthy Futures": Mental Health Research Project.

Background information about this project:
We are writing to provide you with information about the mental health and wellbeing research being conducted with students in the Southern Sea and Vines District. The research is being undertaken as part of a research partnership established in 2004 between DECS Southern Sea and Vines District and the Research and Evaluation Unit at the Women's and Children's Hospital. The Chief Executive of DECS has strongly endorsed both the project and the research partnership.
This partnership consists of two research projects:
A project dedicated to early childhood/early years
A project dedicated to the middle school years
Both of these projects have been established under the banner of CHESS (Child Health and Education Support Services), and have clear links to the DECS Learner Wellbeing Framework, which aims to improve learner wellbeing because wellbeing is 'integral rather than incidental to learning'. These projects are also included within the Wellbeing component of the "Southern Sea and Vines District Imperatives for 2006 District Office Support".

As a DECS Southern Sea and Vines site with junior primary enrolments, we would like to provide you with some further information on the early childhood/early years project.

Getting started – 2004:
In 2004 an Early Years Project Design Team was established, including past and present Early and Primary Years Learning Band Coordinators Megan Tassell & Jillian Jordan, the Early Childhood Initiatives Coordinator Jenny Boag, as well as committed District Preschool Directors, teachers, psychologists, special educators, and researchers from the Women's and Children's Hospital. This team have been working collaboratively for the last 2 ½ years to design the early years mental health project.

Project Aims:

The aim of this project is to gain new knowledge about factors that help children develop resilience, i.e. the capability to cope with the adverse effects of difficult life situations. Information obtained from the research will be used to help parents, teachers, and health professionals more effectively foster mental health resilience in children facing difficult life circumstances. Our long-term goal is to construct an evidence-based intervention program to foster the development of resilience in the early years.

Phase 1: Pre-school Surveys

During 2005, we conducted an initial survey examining the mental health and wellbeing of preschool children. Almost 600 families of children attending preschools across the Southern Sea and Vines District of DECS participated in this study (attached is a detailed summary of the results of the survey in 2005).

In December 2005 we were successful in gaining 4 years of funding from the National Health and Medical Research Council (NHMRC) in order to continue the valuable work we began in 2005. The NHMRC have funded us to conduct a long-term study on resilience following young children from preschool into junior primary school, with surveys completed on each child during Preschool (2006), Reception (2007), and Year 1 (2008). In Term 3 of 2006, all of the 27 Preschools/CPCs in the Southern Sea and Vines District participated in the project by enrolling families into the project, distributing and collecting parent-report surveys, and completing a teacher-reported survey on each participating child. With the first assessment completed, we are now in the process of collating the results and preparing to track the participating children as they move from preschool into primary school.

Phase 2: Tracking the Pre-school children into Reception classes in schools

At this point, we are writing to you to seek your support for the project in 2007 when we conduct the second assessment of the participating children when they are in Reception. Whilst this will not be occurring until Term 3 of 2007, we wanted to give you substantial forewarning of our intentions so that you can take the project into account when you conduct your site planning for 2007. Enclosed is a flow chart displaying the 2007 project timeline for schools.

What the 2007 assessment involves for Reception teachers is:

(a) helping us to identify which children in their Reception class are enrolled in the project
(b) handing out information to families of Reception children, and
(c) completing a 10-minute teacher survey on each child in their class that is enrolled in the project.

In return we are able to provide each school with $6 for every teacher survey that is completed by their junior primary teachers, as well as a school profile report that describes the mental health and wellbeing of the children at their site in comparison to all children in the whole district. This confidential report will be useful for annual reporting and future site planning.

In addition, each school is invited to use their participation in the mental health project to help them to meet their 2007 requirements for the DECS Learner Wellbeing Framework, for which all education sites across SA are required to include an inquiry into a relevant aspect of learner wellbeing in their 2007 site learning plans. We encourage you to use the information we have provided about the project to include in your site learning plans for 2007.

Your school's participation in this project is *vital* to the overall success of the project and will contribute valuable knowledge about the mental health, wellbeing, and resilience of young children. Gaining this knowledge is imperative to our ability to develop evidence-based intervention programs aimed at fostering resilience in early childhood. The provision of such intervention programs is vitally important for helping children to establish a strong foundation that will carry them forward into healthy and successful futures.

On behalf of the project team and district office team, we would like to take this opportunity to thank you in anticipation of your support and cooperation with this important project.

If you have any questions regarding the Healthy Minds Healthy Futures project, please feel free to contact Dr Lauren Miller-Lewis (Ph: 8161 6910 or 8207 3736, E: lauren.millerlewis@adelaide.edu.au).

Yours Sincerely

Dr Lauren Miller-Lewis.
Post-Doctoral Research Fellow
& Project Manager.

Mr Mike Hudson.
District Director.

Government of South Australia
Department of Education and Children's Services

Healthy Minds/Healthy Futures:
Promoting Resilience in Early Childhood.

FACT SHEET FOR PRIMARY SCHOOLS

For a more detailed explanation of this important initiative, refer to the letter attached

WHAT IS THIS PROJECT ABOUT? WHY IS IT IMPORTANT?

- Resilience – the ability to bounce back and cope after tough times in life – is essential for children's wellbeing, learning, and success in life.
- This nationally-funded project will provide new knowledge about factors that help children develop resilience. This knowledge is imperative for developing programs aimed at fostering resilience in early childhood. Providing these programs is vitally important for helping children to establish a strong foundation that will carry them forward into healthy and successful futures.

WHY DO WE NEED YOUR SCHOOL'S INVOLVEMENT?

- The participation of all SSV primary schools is vital to the overall success of this project. SSV District Director Mike Hudson fully supports and encourages your involvement in this project.
- In 2006, all 27 preschool/CPC sites in the SSV district enrolled families into the project and completed surveys on the participating children. We are now tracking these children as they move from Preschool into Reception and Year 1 in order to examine the growth and development of resilience.
- The families participating in the project have already agreed to their child's teachers completing a short survey about their child while in Preschool, Reception, and Year 1.

WHAT HELP DO WE NEED FROM YOUR SCHOOL?

- We are asking **Principals** to support the involvement of their Junior Primary staff in the project.
- **Junior Primary Teachers** will be asked to:
  - Help to identify which Reception children in their class are enrolled in the project.
  - Distribute handouts to Reception children's families.
  - Complete a 10-minute teacher survey on each child in their class who is already enrolled in the project ($6 reimbursement per survey).

WHAT WILL MY SCHOOL GET OUT OF IT?

- A $6 payment for every teacher survey that is completed.
- A confidential school profile report describing the wellbeing of your students.
- An invitation to incorporate this project into your "Learner Wellbeing Inquiry" for 2007 (an inquiry into learner wellbeing in 2007 is a requirement of the DECS Learner Wellbeing Framework).
- Our long-term goal is to introduce to SSV sites an early-years program designed to foster the development of resilience in children.

WHEN WILL THIS HAPPEN?

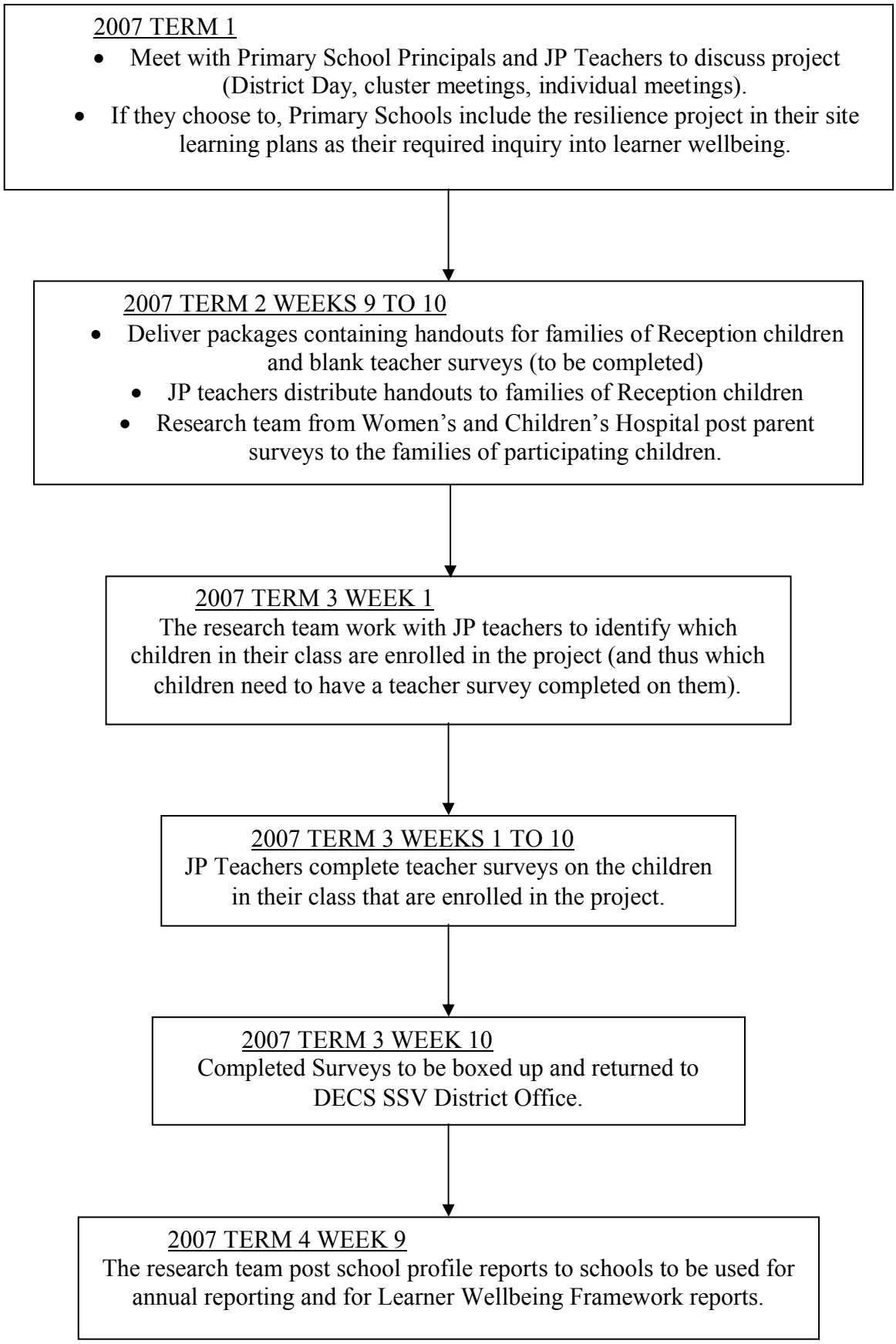
- We will post a survey to parents of participating children at the end of **Term 2, 2007**.
- Reception teachers will be asked to complete the teacher surveys during **Term 3, 2007**.
- We encourage you to record these dates on your Annual Planners.

WHO CAN WE CONTACT FOR MORE INFORMATION?

- Dr Lauren Miller-Lewis and the project team at the Women's & Children's Hospital (ph. 81617207)
- SSV District Early Childhood Initiatives Coordinator & District Curriculum Advisor
- Your local Preschool/CPC

We thank you in anticipation of your support of this important project - Lauren and Mike.

HEALTHY MINDS/HEALTHY FUTURES PROJECT: 2007 TIMELINE FOR PRIMARY SCHOOLS



Research and Evaluation Unit
Women's and Children's Hospital,
72 King William Rd
North Adelaide, SA, 5006
Ph: 81617207

Government of South Australia
Children, Youth and Women's Health Service

Women's & Children's Hospital

30th April, 2007.

«Principal Title» «Principal first name» «Principal Surname» - Principal
«School Name»
«Address»
«SUBURB» SA «Postcode»

Dear «Principal Title» «Principal Surname»

RE: "Healthy Minds/Healthy Futures" Mental Health Resilience Project being conducted on the Fleurieu Peninsula, SA.

Helping young children become more resilient is important for their wellbeing and success in life. Staff at the Women's and Children's Hospital, in collaboration with staff from the Department of Education and Children's Services, are conducting a three-year longitudinal study which will provide important information about resilience and wellbeing in young children. This information will enable us to provide more effective programs to help foster the development of resilience in young children.

The study is being funded by the National Health and Medical Research Council (NHMRC), the Australian Rotary Health Research Fund, and the Channel 7 Children's Research Foundation. In the study, we are following a cohort of young children from preschool into junior primary school, with surveys being completed on each child during Preschool (2006), Reception (2007), and Year 1 (2008).

In Term 3 of 2006, all of the 27 DECS Preschools in the Southern Sea and Vines District of DECS (broadly the Fleurieu Peninsula) participated in the first stage of the project by enrolling families, distributing and collecting parent-report surveys, and completing a teacher-reported survey on each participating child. The second stage of this project involves following these children as they transition from Preschool into Reception at Primary School. During Term 3 of 2007, each participating child's parent and teacher will be asked to complete a brief survey. Our current projections indicate that in Term 3 of 2007, approximately 135 of the 700 participating children will have commenced attending Reception classes at one of the Private (Catholic/Independent) Schools on the Fleurieu Peninsula.

We have been advised that your school is one of the Private Schools in the area which may have a number of the children participating in the study enrolled in your Reception class. We are hoping you will support us to allow these children to continue to participate in the project in Term 3 of 2007. Specifically, we are asking Principals to support the involvement of their Junior Primary staff in the project.

In Term 3 of 2007, Junior Primary Teachers will be asked to:
(a) help us to confirm which participating children are attending your school

(b) distribute a notice to families of these children (see attached), and
(c) complete a 10-minute teacher survey (see attached) on each child in their class who is enrolled in the project. Parents have already given permission for teachers to complete these surveys on their children.

All participating schools will be sent a final report that describes the findings and conclusions of the study. As a token of our appreciation, we are also able to provide your school with a $6 reimbursement for every teacher survey that is completed by your junior primary teachers.

This research project has been approved by the Research Ethics Committee at the Women's and Children's Hospital. If you have any questions or concerns, please feel free to contact Ms Brenda Penny, Research Secretariat on 8161-6521. This research has also been approved by the relevant research approvals committee of the SA Department of Education and Children's Services (DECS) and Catholic Education SA. Please be assured that the information provided will be treated in the strictest confidence, and will not be released to anyone else without the permission of the child's parents.

Your school's participation in this project is very important for the overall success of the project and will contribute valuable knowledge about the mental health, wellbeing, and resilience of young children. Gaining this knowledge is imperative to our ability to develop evidence-based intervention programs aimed at fostering resilience in early childhood. The provision of such intervention programs is vitally important for helping children to establish a strong foundation that will carry them forward into healthy and successful futures.

We will telephone you in the next few days to tell you more about the study, answer questions you may have, and to ask if you are willing for your school to become involved in the project.

If you have any questions regarding the Healthy Minds Healthy Futures project, please feel free to contact us directly at the Women's and Children's Hospital (Professor Michael Sawyer, Dr Lauren Miller-Lewis, or our Research Assistant Amelia Searle: Ph: 8161 7207).

On behalf of the project team, we would like to take this opportunity to thank you in anticipation of your support and cooperation with this important project.

Yours Sincerely

Professor Michael Sawyer.
Head, Research & Evaluation Unit

Dr Lauren Miller-Lewis
Research Fellow, Research & Evaluation Unit

Research and Evaluation Unit
Women's and Children's Hospital,
72 King William Rd
North Adelaide. SA. 5006

Government of South Australia
Children, Youth and Women's Health Service

Women's & Children's Hospital

Healthy Minds/Healthy Futures: Promoting Mental Health Resilience in Early Childhood

27th June, 2007.

«PROJECT_LIASION_PERSON_FIRST_NAME»
«PROJECT_LIASION_PERSON_SURNAME» - NOMINATED PROJECT LIAISON PERSON
«SITE_NAME»
«ADDRESS»
«SUBURB» SA «POSTCODE»

Dear Liaison Persons and Reception Teachers,

RE: Term 3 2007 Stage 2 Follow-Up Assessment for the "Healthy Minds/Healthy Futures" Mental Health Resilience Project.

Please find enclosed all of the materials you will require for your school to take part in the Stage 2 follow-up up surveys of Reception children for the Healthy Minds/Healthy Futures project in Term 3 2007. We have included a detailed set of procedural guidelines which we hope will assist with the process.

Also enclosed is a list of names of participating children whom we believe will be attending your school in Term 3 2007. It is these children for whom we would like teacher surveys completed. We would be most grateful if you could cross-reference this list with class lists, and let us know if there are any unfamiliar names.

If you have any questions about the Term 3 2007 follow-up assessment, or about the Healthy Minds/Healthy Futures project in general, please feel free to contact us directly at the Women's and Children's Hospital (Research Assistant Amelia Searle or Professor Michael Sawyer: Ph: 81617207, Email: amelia.searle@adelaide.edu.au). If you require any more copies of the surveys or any other materials, please contact Amelia and she will send out more to you.

On behalf of the project team, we would like to thank you for your support and cooperation with this important project.

Yours Sincerely

Professor Michael Sawyer
Head
Research & Evaluation Unit

Dr Lauren Miller-Lewis
Post-Doctoral Research Fellow
Research & Evaluation Unit

Healthy Minds/Healthy Futures:
Child Resilience Study.

Stage 2 Follow-Up Assessment: Term 3 2007.

Procedural Guidelines for Participating Schools and Teachers

This study aims to identify characteristics of resilient children, and factors which help children cope with the adverse effects of facing difficult life situations. The project involves three assessments of children: one when the child was in Preschool (2006), one in Reception (2007), and one in Year 1 (2008). Participation in each assessment requires the completion of two questionnaires on each child – one by the parent who is the primary caregiver, and one by the teacher who best knows the child. This information will help parents, teachers, and health professionals to more effectively foster mental health resilience in children facing adversity. In doing so, we hope to give children the best possible start to life.

The following information includes some guidelines that will help the project run as smoothly as possible.

A short notice informing parents/guardians about Stage 2 of the study, suitable for your general school newsletter, has been provided to your school. If your school has not already done so, please include this in your next school newsletter if possible.
We have put together a somewhat more detailed notice/handout designed specifically for families with children attending Reception classes. We would be grateful if you would distribute this notice (provided to you printed on purple paper) to the families of all Reception children on the first day of Term 3 (Monday 23rd July 2007). This notice is designed to let families of participating children know that Stage 2 of the study is about to commence, and that the second parent-survey will be arriving in their mail in the next few days. Please note that this notice has been written in a way that makes it suitable to distribute to all families in each Reception class, not just those who are enrolled in the study. On the back of this notice, we have included a list of "Helpful Organisations", that may be of use to these families.
We have enclosed a list of the names of participating children whom we believe will be attending Reception classes at your school in Term 3, 2007. These are the children for whom we would like Reception teachers to complete a teacher-reported survey. Because of potential last-minute changes in school enrollments or because of families moving, this list may not be 100% accurate. We would be most grateful if nominated Project Liaison Persons and Reception teachers could cross-reference this list with their class roll lists, and let us know if there are any unfamiliar names. We would also appreciate it if Reception teachers could please fax us your Reception class roll list of names for Term 3 2007 (as soon as they have been finalised), so that we can cross-reference your enrolled students with our list of participating children and ensure we haven't missed anyone. The Fax number for the Research and Evaluation Unit at the Women's and Children's Hospital is Fax: 81616906. To help protect the privacy of the children in your class, we suggest that before faxing this list to us, for each child's surname, cross out all but the first initial of the child's surname. If we determine that

any of the children in your class who were not on the original list we gave you are actually enrolled in the study, we will contact you to ask that a teacher survey be completed on that child.
We have enclosed a number of blank green-covered teacher questionnaires. We would greatly appreciate it if you could complete a survey for each of the children in your Reception class who have been identified as enrolled in the Healthy Minds/Healthy Futures study. You will have until the end of Term 3 to complete the questionnaires for each child, but we recommend getting started as early as you can. For new children who have started in Reception at your school at the beginning of Term 3, you will need to wait until Week 5 of Term 3 (20th August) before completing surveys on these children, in order to allow you some time to get to know them.
The teacher-reported survey will take teachers approximately 10 minutes to complete for each participating child. The first few surveys you complete may take approximately 10-15 minutes, but as you become more familiar with the questions and have set a benchmark for where you expect children to fit, the time per questionnaire will lessen to as little as 5-10 minutes. Previous experience of other teachers tells us that doing a batch of questionnaires in each sitting speeds up the process (because it is easier to 'get on a roll').
At the end of Term 3, please box up all of the completed teacher questionnaires, and send them through internal courier to:

Amelia Searle
DECS Southern Sea and Vines District Office
5th Floor Noarlunga House,
Noarlunga Centre, SA, 5168.

Mark the front of the box/package with "Healthy Minds/Healthy Futures" and "Do Not Bend", and put a return address on the back. Amelia will then take the completed surveys to the Research and Evaluation Unit at the Women's and Children's Hospital for data scanning and data analyses. Because this project is nationally funded, we are fortunate enough to be able to financially contribute to the time teachers devote to this project. Our project budget enables us to pay schools $6.00 for every teacher-reported survey that is completed in Term 3 of 2007. Once we have received your school's completed teacher surveys, we will arrange for the appropriate reimbursement to be paid to your school. The decision about how school sites use this money will be left up to the discretion of the school principal (e.g., for teacher relief time, overtime, purchasing resources for the Reception class, an excursion, etc). We hope that the provision of this repayment for time will help compensate for the burden placed on school staff as a result of being involved in this project. Please also note that the learning involved with completing the teacher questionnaires can be counted towards teachers 37.5 yearly hours of professional development, but teachers need to decide how much of it is learning (i.e. was it the first 10 questionnaires before it became more routine?).

For further information or clarification, please feel free to contact Research Assistant Amelia Searle (at the Women's and Children's Hospital on 08-81617207), or either Jenny Boag (Early Childhood Initiatives Coordinator) or Jillian Jordan (Improvement Coordinator) at DECS Southern Sea and Vines District Office (08-82073770).

Thank-you very much for your help with this important research. We couldn't do it without your support!

Government of South Australia
Department of Education and Children's Services

Government of South Australia
Children, Youth and Women's Health Service

Women's & Children's Hospital

Healthy Minds/Healthy Futures:
Child Resilience Study.

STAGE 2 OF THE STUDY ABOUT TO START

During Term 3 of 2006, the Women's and Children's Hospital and the Department of Education and Children's Services (DECS) commenced an important study examining resilience and wellbeing in young children. A total of 700 children attending Preschools in the Southern Sea and Vines District of (DECS) participated in the first stage of the study.

We wish to inform families who participated in Stage 1 of the study in 2006 that Stage 2 of the study is about to start. Participating families may recall that this is a three-year study involving the completion of three surveys one year apart: one at approximately age 4, age 5, and at age 6. On Wednesday July 23rd 2007, parents of participating children will have the second survey posted to their homes, and will be asked to return the completed survey to the Women's and Children's Hospital in the reply-paid envelope provided. The 2007 parent survey will again take about 30 minutes to complete, and will ask parents to answer questions about their child's self-esteem, emotions, behaviour, and mental health, their life experiences, and their relationships with their parents, teachers, and peers. As in 2006, teachers will again be asked to complete a short survey about the participating children.

We would be very grateful if participating families would continue to participate in the study, because your continued involvement helps us to gather important information about resilience in young children. Keeping as many children as possible involved in the study means that our results will truly represent the growth and development of resilience in young children. It is very important that we learn more about these issues in the hope that we can create better ways of helping young children develop resilience. Thank you for your time and consideration.

HAVE YOU MOVED IN THE LAST 12 MONTHS?

One of our biggest challenges is keeping in touch with participating families who move. If you have moved in the last 12 months and not yet provided us with your new contact details, please phone us at the Women's and Children's Hospital on 81617207 or Email our research assistant Amelia on amelia.searle@adelaide.edu.au . We will then be able to send the second survey to your new address.

THANK YOU!

If you have any questions about the Healthy Minds/Healthy Futures Child Resilience Study, please contact Research Assistant Amelia Searle on Ph: 81617207, Email: amelia.searle@adelaide.edu.au .

SUGGESTED NOTICE FOR SCHOOL NEWSLETTER

Stage 2 of 'Healthy Minds Healthy Futures' Child Resilience Study

During Term 3 of 2006, the Women's and Children's Hospital and the Department of Education and Children's Services (DECS) commenced an important study examining resilience and wellbeing in young children. A total of 700 families of Preschool children in the Southern Sea and Vines District of DECS participated in the first stage of the study.

We wish to inform families who participated in Stage 1 of the study in 2006 that Stage 2 of the study is about to start. At the beginning of Term 3 (July 23rd 2007), parents of participating children will have the second survey posted to their homes, and will be asked to return the completed survey in the reply-paid envelope provided. Once again, teachers will also be asked to provide information about the participating children.

We would be very grateful if participating families would continue to participate in the study.

Research and Evaluation Unit
Women's and Children's Hospital,
72 King William Rd
North Adelaide, SA, 5006
Ph: 81617207

Government of South Australia
Children, Youth and Women's Health Service

Women's & Children's Hospital

Healthy Minds/Healthy Futures:

Child Resilience Study

25th July, 2007.

«Title» «First_Name» «Last_Name»
«Street_Name»
«SUBURB» SA «Postcode»

DEAR «Title» «Last_Name»

In Term 3 of Preschool in 2006, your child «Child's christian name» participated in the Healthy Minds/Healthy Futures Child Resilience Study. This study is providing important information about resilience and well-being in young children in the Southern Districts. This information will enable us to create better ways of helping young children develop resilience, to give them the best possible start in life. In the study we are asking parents to complete a questionnaire about their child in 2006, 2007, and 2008. We are very grateful for your participation in 2006.

We have enclosed your questionnaire for 2007. The questionnaire will again take approximately 30 minutes to complete, and is similar to the one you received in 2006. This will allow us to learn how children have changed over the past year. We would be grateful if you could complete your questionnaire, and return it in the reply-paid envelope provided. It would be helpful if the same person who completed the survey last year could complete the survey again this year, but either parent/caregiver is fine. In order for results to truly represent all young children, it is important that as many families as possible continue to take part in this study, *regardless* of whether your child is experiencing any difficulties. As in 2006, we will again be asking your child's teacher to complete a brief questionnaire describing your child's behaviour at school/preschool. We will organise this directly with your child's teacher (as you have already given us permission to do this, you don't need to do anything for this part). However, if you have changed your mind and prefer that your child's teacher does not complete a survey this year, please let us know.

This study has been approved by the Department of Education and Children's Services (DECS), and by the Research Ethics Committee at the Women's and Children's Hospital. If you have any questions or concerns, please feel free to contact Ms Brenda Penny, Research Secretariat on 8161-6521. Please be assured that any information you provide will be treated in the strictest confidence. Participation is voluntary, and you are free to discontinue your participation at any stage. If for some reason you choose not to respond this time, please let us know by returning a note or the blank survey in the reply-paid envelope. If you have any questions or comments about the study, please feel free to contact our research assistant Amelia Searle or Professor Michael Sawyer at the Women's and Children's Hospital (8161-7207).

Thank you again for helping with this important study - we couldn't do it without your support.
Yours sincerely

Professor Michael Sawyer
Head, Research & Evaluation Unit

Dr Lauren Miller-Lewis
Research Fellow, Research & Evaluation Unit

P.S. *We have enclosed some stickers for your child as a small token of our appreciation of your help. As in 2006, your child will also be entered into a raffle draw to win one of four $50 'Toys-R-Us' vouchers*

Wed 1st August 2007

Last week the second survey for the three-year Healthy Minds/Healthy Futures Child Resilience Study was mailed to you.

If you have already completed and returned this survey to us, please accept our sincere thanks. If not, please do so as soon as possible. It is only through your continued involvement that we can gather important information about resilience in young children. In order for results to truly represent all families, it is important that as many families as possible continue to take part in the study.

If you did not receive the survey, or it got misplaced, please call my research assistant Amelia Searle on 8161 7207 and we will post another one in the mail to you today.

Sincerely,

Professor Michael Sawyer
Women's and Children's Hospital

Research and Evaluation Unit
Women's and Children's Hospital,
72 King William Rd
North Adelaide, SA, 5006
Ph: 81617207

Government of South Australia
Children, Youth and Women's Health Service

Women's & Children's Hospital

Healthy Minds/Healthy Futures:

Child Resilience Study

22nd August, 2007.

«TITLE» «PARENTS_CHRISTIAN_NAME» «PARENTS_SURNAME»
«STREET_NAME»
«SUBURB» SA «Postcode»

DEAR «TITLE» «PARENTS_SURNAME»

Four weeks ago, we sent you a survey that asked about your child «Childs_christian_name»'s resilience, emotions, behaviour, and well-being. As of today, we have not yet received your completed survey.

The responses and comments of families who have already responded show a great deal of variety in children's life experiences, their emotions and behaviour, and how they are coping (both good and bad). This information is vitally important and will help us develop programs to build resilience in young children.

We are writing again because of the importance that your questionnaire has for helping to get accurate results, and for the success of this study. It is only by hearing from nearly everyone enrolled in the study that we can be sure that results will truly represent all young children. *Regardless* of whether your child is experiencing any difficulties, we would be grateful if you would continue to participate.

A few people have written to say that they should not have received the questionnaire as their child has not started school yet, or because they did not return a completed survey in 2006. You can still complete a survey if your child is not yet at school: just answer the questions by referring to preschool instead. If you agreed to take part in 2006 but didn't get around to completing a survey for whatever reason, but would still like to be a part of the study, we would be delighted if you could complete a survey on your child this year.

A comment on our survey procedures. An identification number is written on your survey so that we can check your name off the mailing list when it is returned, and link your responses with any you provided last year. Participants' contact details are stored separately and securely, so individual names cannot be connected with the results. Protecting the confidentiality of your information is very important to us, and to the Women's and Children's Hospital.

In case the survey we sent you has been misplaced, we have enclosed a replacement survey.

We hope that you will fill out and return the survey soon, but if for any reason you prefer not to, please let us know by returning a note or blank survey in the enclosed reply-paid envelope. If you have any questions please feel free to contact Ms. Amelia Searle or Professor Michael Sawyer at the Women's and Children's Hospital (8161-7207).

Yours sincerely

Professor Michael Sawyer
Head, Research & Evaluation Unit

Dr Lauren Miller-Lewis
Research Fellow, Research & Evaluation Unit

Research and Evaluation Unit
Women's and Children's Hospital,
72 King William Rd
North Adelaide, SA, 5006
Ph: 81617207

Government of South Australia
Children, Youth and Women's Health Service

Women's & Children's Hospital

10th August, 2007.

«TEACHER'S NAME»
«SchoolAddress»

DEAR ***«TEACHER'S NAME»***

RE: "Healthy Minds/Healthy Futures" Mental Health Resilience Project being conducted on the Fleurieu Peninsula, SA.

Helping young children become more resilient is important for their wellbeing and success in life. Staff at the Women's and Children's Hospital, in collaboration with staff from the Department of Education and Children's Services, are conducting a three-year study which will provide important information about building resilience in young children. The study commenced in 2006 and is following a cohort of 700 young children from preschool into junior primary school, with surveys completed by parents and teachers on each child during Preschool (2006), Reception (2007), and Year 1 (2008). This information will enable us to provide more effective programs to help foster the development of resilience in young children.

I am writing to seek your help with the reception stage of this study. An important part of the study involves obtaining informaton about children's emotional and behavioural functioning and wellbeing from their classroom teachers. **«CHILD'S_NAME»** is participating in the study and I would be most grateful if you would complete the enclosed questionnaire and return it to me in the reply-paid envelope provided. The questionnaire takes approximately 10 minutes to complete. **«CHILD'S_NAME»** 's parents have signed a consent form giving permission for you to complete the enclosed questionnaire about their child. A copy of this signed consent form is attached.

This study has been approved by the Research Ethics Committee at the Women's and Children's Hospital. If you have any questions or concerns, please feel free to contact Ms Brenda Penny, Research Secretariat on (08) 8161-6521.This research has also been approved by the relevant research approvals committee of the SA Department of Education and Children's Services (DECS) and Catholic Education SA. Please be assured that the information provided will be treated in the strictest confidence, and will not be released to anyone else without the permission of the child's parents.

If you have any questions regarding the Healthy Minds Healthy Futures project, please feel free to contact us directly at the Women's and Children's Hospital (Research Assistant Amelia Searle or Professor Michael Sawyer: Ph: (08) 8161-7207, Email: amelia.searle@adelaide.edu.au).

On behalf of the project team, I would like to take this opportunity to thank you in anticipation of your support and cooperation with this important project.

Yours Sincerely

Professor Michael Sawyer.
Head, Research & Evaluation Unit.

Healthy Minds/Healthy Futures:

Child Resilience Study

Newsletter

NO. 2: FEBRUARY 2008

Welcome to the second Healthy Minds Healthy Futures newsletter. As you know, this study aims to gather important information about resilience and wellbeing in young children. We are really pleased with the level of continued participation from families during 2007, especially as many of you have moved, so thanks for updating your contact details with us. Such high participation means results will be more relevant to your children, and to all young children in the community. Thankyou for your continued support, it is truly priceless, and we could not do this without you.

Many families have faced various changes over the past year, one being that most children have since started their first year of school! It's been great to hear how children have coped with all the changes in their lives. Now that we have 2 years of information on children's growth and development, we can start examining more deeply how we can best foster resilience in young children. We will then share results with you, and ultimately, we will translate findings into a district-wide program that builds strengths in all children.

Some Facts about Children and Families Participating in the Second Stage of the Study

Since the last survey…

- Of the 700 families who took part in 2006, over 96% also took part in 2007!
- Many families had moved; from the next street/suburb, to further suburbs like Salisbury, regional areas like the Barossa, and even to Queensland, New South Wales, the Northern Territory and Tasmania!
- 87% of children were aged 5 years.
- Families welcomed 35 new babies (not counting those 'on the way').
- Over half (54%) of families had experienced at least one difficult life event during the past 12 months. For example, 17% experienced the death of a friend or extended family member.
- 82% of children were living with both natural parents, and 14% were living in a single parent family.
- 60% of mothers were working at least part-time hours.
- Children were at 90 different preschool/school sites, and 1 in 5 were attending private school. 23% of children were in their first school term.

Government of South Australia

Children, Youth and Women's Health Service

Women's & Children's Hospital

This study is being conducted by the Women's and Children's Hospital, the Department of Education and Children's Services (DECS), and the University of Adelaide, and is funded by the National Health and Medical Research Council, the Australian Rotary Health Research Fund, and the Channel 7 Children's Research Foundation.

You can contact the research team at:

Research & Evaluation Unit
Women's & Children's Hospital
72 King William Rd
North Adelaide
5006

Ph. (08) 8161 7207

Fax. (08) 8161 6906

What Happens Next? The Final Stage of the Study

The final stage of the study is almost here! The third and last assessment will occur in Term 3 (July – October) 2008, when children will be in Reception or Year 1 at school. Families of children attending Southern Sea and Vines District Schools will see a reminder notice in their school's newsletter in July, to signal the start of this last survey assessment. The procedure will be exactly the same as last year, so all you need to do is ensure the address details we have for you are current, and watch the mail for your survey in July.

As in 2007, families who agreed to complete parent surveys will be posted a survey to their home address at the start of Term 3, along with a reply-paid envelope to post the completed survey back to us at the Women's and Children's Hospital. The survey questions will be very similar to those in 2006 and 2007, and will again take about 30 minutes to complete. We are asking the same questions to learn how children have changed, grown and developed over these past 3 years. We look forward to hearing what exciting changes the new year has brought you and your family!

Your Privacy – What Happens to the Information?

Your privacy is of the upmost importance to us. The Research and Evaluation Unit at the Women's and Children's Hospital follows strict procedures to ensure your privacy is protected. All information you provide will remain entirely confidential – no names, addresses, or other identifiable information will be released. The information you provide will never be used in any way that could identify you, your child, or your family. Only the combined results from everyone in the project will be discussed and published.

Again, we will also ask your child's teacher to complete a survey in Term 3, describing your child's behaviour at school. We will organise this through the school, so you don't have to do anything for this part. Children often behave differently in different settings (e.g. home and school), which is why teachers' views, along with parents' views, are so important to include in this study.

We really hope that you will continue your participation in this important study by taking part in the final survey assessment. For results to truly represent all families, it is important that as many families as possible take part in the final stage, regardless of whether you have moved from the district, or whether or not you are worried about your child's wellbeing.

Caring for 4 to 6 year-old Children: Why Stories are Important

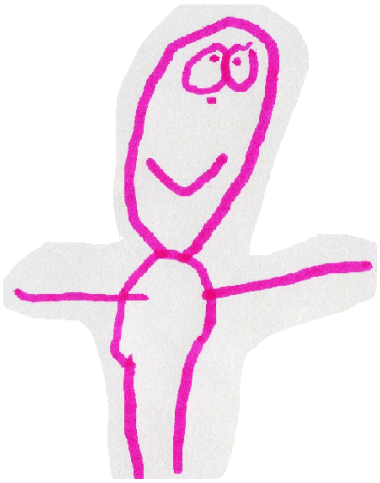
Stories help children to cope with feelings and problems that they experience, and can help them to escape from the stresses and pressures of their world. Story time can be a special time with you that your children will remember all their lives. If it's a happy time, it helps build good relationships between you and your child and helps your child develop a sense of security and good self-esteem. Stories are one of the ways that children learn to enjoy reading. Many people look back with pleasure on their favourite childhood stories. Reading aloud to young children is so important and has an impact on their overall development and future learning. Children who enjoy reading are likely to become confident learners. Also, stories help to develop children's imaginations.

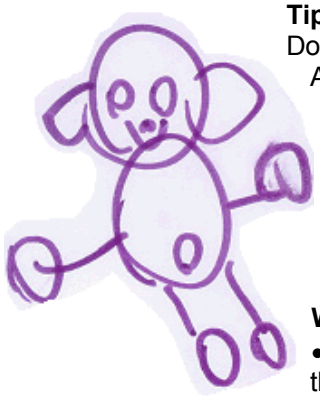
When you read a story that contains feelings, your child is helped to accept his/her feelings and to understand how others feel. He learns that she/he is not alone and that other children may feel the same way. This helps him to know that his/her feelings are okay. You can also learn to understand how your child feels when you see her/him respond to the feelings in the story.

Some Great Children's Books:

- "Where the Wild Things Are" by Maurice Sendak
- "Hop on Pop" & "Fox in Socks" by Dr. Seuss
- "Diary of a Wombat" by Jackie French
- "Mr McGee" & "Cuthbert's Babies" by Pamela Allen
- "Koala Lou" by Mem Fox
- "When I'm Feeling (angry, scared, loved, etc.)" by Trace Maroney

Also, check out the Advertiser Little Big Book Club website: www.thelittlebigbookclub.com.au





Tips for story tellers

Don't make story time a reading lesson – it's a time for sharing, relaxing and fun! Allow your child to choose the books he/she likes to read, but try out a range of books to have a choice to explore. Lists of suitable books for your child's age can often be found at your local council library, and school libraries usually have large book selections. Help children find books about their interests, like cars, dogs, or dinosaurs. Also, beginning book readers need books with simple words for success and enjoyment. Books that are too hard can put them off.

What should you look for?

- Books which vary the important roles – some where the prince saves the princess and some where the princess saves the prince.
- Interesting words/rhymes – children enjoy words and will like stories with some interesting or 'big' words to have fun.
- Stories about your child's hopes and wishes e.g. a book about starting school or having a birthday.
- Stories about things children know about e.g. stories about children of their own age.
- Books that explore the unhappy and angry feelings as well as good feelings e.g. books about moving house should talk about the child being a bit unsure and worried as well as being excited.

What parents can do

- Try to read to your child every day, even for a few minutes
- Visit the local library for storytelling sessions
- Make a life story book for your child to show where he/she has been, what she/he has achieved and important milestones. Have photos of special events, like the first day of school
- When your child reads words on a sign or a food packet let her know you are proud he/she is reading

Information Source:
Parenting SA Parent Easy Guide 57 - www.parenting.sa.gov.au & Child and Youth Health- www.cyh.com. These websites are a fantastic source of practical and easy to follow tips and information on a huge range of parenting issues and child health and behaviour topics. Check them out to see the full range of topics they cover.

If You Are Moving… Please Remember to Keep in Touch!

You are unique and irreplaceable! One of our biggest challenges is keeping in touch with families who move. Please help us keep in contact with you throughout 2008 by updating your address and contact details if you move house or change phone numbers during this time. You can do this in a number of ways:

- Phone us at the Research and Evaluation Unit on (08) 8161 7207.
- Email our research assistant Amelia on amelia.searle@adelaide.edu.au
- Complete the 'change-of-address' slip enclosed with this newsletter and send it to us in the pre-paid envelope provided.

THANK YOU!

Providing Feedback to Us

We continue to receive positive and interesting feedback from many families. Here are some comments we'd like to share with you:

"Our child is loving going to school. She is always keen to get there, and was dressed and ready by 5.30am on the first day back."

"My child was operated on and missed some weeks of school, and though causing a little disruption to our lives, my child was amazingly resilient and brave and looks upon the operation with pride."

"Fortunately, our child is very happy, sociable and likeable. We love her a lot! PS: she has recently discovered the delight of riding a bicycle on 2 wheels."

"Recently my child has started school and has long days as I work full-time, but all considered he is doing very well. I am very proud of his attitude towards everything and he copes in his own special way."

If you have any feedback about being in the study that you would like to pass on, please contact us at the Research & Evaluation Unit on (08) 81617207. We'd love to hear from you.

APPENDIX D

DATA PREPARATION AND PRELIMINARY ANALYSES

D1 Preliminary Analyses Specific to Chapter 5

D1.1 Factor pattern reproduction parameters.

The subjects-to-variables ratio was estimated prior to scale development and questionnaire distribution to ensure a sufficient level of statistical power, allowing a stable solution with reliable factors to emerge, thereby providing a better estimation of the population pattern. As a general rule of thumb, recommended ratios have ranged from as low as 5:1, to as high as 20:1 (Guadagnoli & Velicer, 1988; Velicer & Fava, 1998). For the current 24-item scale, a 20:1 ratio would require 480 participants. A rough scale of absolute sample size adequacy rates 500 as very good, with a minimum of 200 needed (Comrey, 1988; Comrey & Lee, 1992). A sample of approximately 500 children was considered easily attainable; teachers would need to complete surveys on 80% of the initial 2006 sample, which was highly likely given the district-wide commitment of teachers, and that parental consent had already been obtained for the entire longitudinal study. Indeed, the final sample of 547 (with full item-level data) was well above these recommendations.

While an accurate sample factor solution is at least somewhat related to absolute sample size, it is also a function of overdetermined factors and high communalities and loadings (Guadagnoli & Velicer, 1988; Velicer & Fava, 1998). Three or more marker variables (those expected to load strongly on only one factor) per retained common factor are needed for a meaningful and stable factor structure; consequently, starting out with at least five variables representing each hypothesised factor allows for poor performance of some variables (Comrey & Lee, 1992; Velicer & Fava, 1998). The current analysis took an exploratory approach; however, previous factor analytic research has found the three components of engagement (behavioural, emotional and cognitive) form distinct but inter-correlated subcomponents. Items have also been found to load on a unidimensional scale (B. C. Patrick et al., 1993; Wellborn, 1991). With this in mind, 6, 8 and 10 variables were included for cognitive, emotional and behavioural components of engagement, respectively.

D1.2 Missing data.

While teachers completed the engagement questionnaire for 575 reception children, only 547 children had all 24 items in the questionnaire completed. It is the scores of these 547 children that are subject to factor and Rasch analyses. As missing data excluded less than 5% of the sample from these analyses, it was considered to be missing at random. Nonetheless, *t*-tests and chi-square tests for independence were conducted using model and demographic variables to determine if there were systematic differences between those with full data and those without.

There were no significant differences between groups for any of the model variables, including the final engagement scale score (as children were allowed up to 20% of missing data to receive a total score). Additionally, no differences were seen regarding number of terms at school, school type (public/private) or most other demographic variables. However, children without full engagement scale data were more likely to be in a single parent family in preschool (32.1% vs. 15%), χ^2 (1) = 4.64, $p < .05$, and were more likely to be born to an adolescent father (10.7% vs. 1.5%) χ^2 (1) = 7.72, $p < .01$.

D1.3 Distribution assumptions - normality, linearity and outliers.

Histograms of each variable and scatterplots of several combinations of variables were visually inspected to assess univariate and multivariate normality and the presence of outliers. Only one large departure from univariate normality was seen - the item 'appears angry' was quite positively skewed. No (univariate or multivariate) outliers were seen, which was unsurprising given the 5-point Likert response scale effectively restricted such opportunity. There was also no evidence of a curvilinear association between various pairs of variables.

D2 Preliminary Analyses for Multivariate Analyses in Chapters 5 to 9

All main model variables were examined to meet preconditions of multivariate statistical procedures, including ordinary least squares regression, path analyses, MANOVA, cluster analysis and discriminant function analysis.

D2.1 Normality and univariate outliers.

Firstly, the normality of variable distributions was examined using skewness and kurtosis values, normality statistics, and histograms. As it happened, all skewness and kurtosis values (the value divided by its standard error) were significantly higher than zero, and the Kolmogorov-Smirnov statistic was significant for all variables, suggesting the assumption of normality had been violated (see Table D1). However, skewness and kurtosis values, and the Kolmogorov-Smirnov normality value, are often significant among large samples, as values are dependent on sample size. Consequently, more weight was placed on visually inspecting the distribution of scores in histograms, as recommended by Tabachnick and Fidell (2001).

Several variables were also quite skewed on visual inspection, especially the teacher reported variables; teacher-reported student-teacher relationship, and child self-esteem and self-efficacy were all quite positively skewed, and teacher-reported child mental health problems, parent- and teacher-reported school avoidance behaviour, and disciplinary action, unexplained absences/lateness, and absence from the classroom were quite negatively skewed. Parent-reported parent-child relationship and mental health problems were moderately skewed. Parent-reported self-efficacy was only slightly skewed, and parent-reported self-esteem appeared approximately normal. Teacher-reported engagement and school progress looked normal. This does not necessarily reflect problems with the scales, but rather the nature of the underlying constructs. For example, most general community samples of children show positively skewed distributions for self-esteem, self-efficacy, and engagement, and negatively skewed distributions for mental health problems and school risk behaviours such as disciplinary action and absence. As discussed by Tabachnick & Fidell (2001), skewness and kurtosis do not make a substantive difference in analyses with a sample size of at least 200. Consequently, this was unlikely to be a problem with the current sample of 575.

Furthermore, all residual error terms of the independent variables were normally distributed, and showed constant variance across the range of predicted values. This suggested that any departures from normality did not substantively affect analyses.

Table D1
Normality Statistics for Quasi-Interval (Likert-scaled) Variables (n = 575)

Variable	Skewness (SE)	Kurtosis (SE)	Normality K-S†
Preschool			
Parent-child relationship (p)	-0.64 (0.10)	-0.21 (0.20)	.091***
Self-efficacy (p)	-0.46 (0.10)	-0.12 (0.20)	.083***
Self-esteem (p)	-0.60 (0.10)	0.00 (0.20)	.104***
Self-concept (p)	-0.57 (0.10)	0.03 (0.20)	.069***
Total mental health problems (p)	0.67 (0.10)	0.22 (0.20)	.111***
Student-teacher relationship (t)	-1.71 (0.10)	3.33 (0.20)	.187***
Self efficacy (t)	-0.80 (0.10)	0.24 (0.20)	.124***
Self esteem (t)	-0.59 (0.10)	0.03 (0.20)	.072***
Self-concept (t)	-0.73 (0.10)	0.20 (0.20)	.083***
Total mental health problems (t)	1.24 (0.10)	1.23 (0.20)	.146***
Reception			
Cognitive-behavioural engagement[a] (t)	0.36 (0.10)	0.46 (0.20)	.061***
Emotional engagement[b] (t)	0.10 (0.10)	-0.61 (0.20)	.109***
School avoidance[c] (p)	2.10 (0.11)	4.28 (0.22)	.334***
School avoidance (t)	2.78 (0.10)	9.95 (0.20)	.361***
Year 1 (n = 551)			
School progress (t)	-0.12 (0.11)	-0.29 (0.21)	.149***
Disciplinary action (t)	0.83 (0.10)	-0.05 (0.21)	.233***
School absence/lateness (t)	2.39 (0.10)	5.77 (0.21)	.380***
Classroom absence (t)	2.02 (0.10)	3.74 (0.21)	.444***

†Kolmogorov-Smirnov test of normality [a] refers to the 11-item cognitive-behavioural engagement scale developed in chapter 5, and used in the following chapters. [b]refers to the 5-item emotional engagement scale developed in chapter 5. This scale, however, was not used within any other thesis chapter. [c]n = 498
*** $p < .001$

Several outliers were identified through box plots, with values that were larger than three standard deviations above the mean. However, histograms showed that these cases were not 'isolated' from the rest of the sample; sample distributions trailed off gradually, and outliers were not separated from the main distribution. An examination of the 5% trimmed mean showed there would be no substantive difference to the mean score for any variable if the most extreme cases were removed. Consequently, it was decided to retain these cases.

D2.2 Multivariate outliers.

For each of the analyses used in chapters 5-9, dummy regressions were run with all of the model independent variables as predictors, and Child ID as the dummy dependent variable. Between 13 and 27 children out of the sample of 575 (i.e., approximately 2-5%) were identified as multivariate outliers across the different regression models, due to their Mahalanobis distance value being above critical values (the value of which differed depending on the regression *df*). A series of stepwise regressions were then run with the same previous independent variables, and a dummy dependent variable that identified each outlier (in turn) from the rest of the sample. These regressions identified the outliers were different from the rest of the sample for two main reasons: (1) they were the only Aboriginal/Torres Strait Islander children in the sample or (2) they had outlying scores on the most highly skewed variables (i.e., teacher-reported self-concept, mental health problems, and teacher-child relationship quality). Scatterplots of pairs of these teacher-reported variables showed that, whilst these cases received the most extreme pairs of scores in the sample, they weren't terribly bad. For example, several children showed higher self-concept levels than would be predicted based on the quality of their teacher-child relationship, and one child had higher mental health problems than would be predicted based on his self-concept levels. All analyses were re-run without outliers, and no appreciable differences were found in results, in terms of absolute effect sizes or significance levels. Consequently, it was decided that as these outliers had no effect on the results, that they would be retained in all analyses.

D2.3 Transformation.

In an attempt to improve normality of the skewed variables discussed above, transformations were conducted, as recommended by Tabachnick and Fidell (2001). Initially, for the teacher-reported variables, inverse (and reflect and inverse) transformations were conducted for the skewed distributions, given they were extremely skewed. As the skewed parent-reported variables were not terribly extreme, square root (and reflect and square root) transformations were conducted. However, these transformations did not improve distributions. Consequently, all other transformations

offered within SPSS were attempted for these variables, with no success. Often, transformation simply reflected the initial distribution, without making any appreciable difference to warrant keeping the transformed variables. Given this, and that multivariate analyses are reasonably robust to violations of normality with large samples (Tabachnick & Fidell, 2001), variables were kept un-transformed.

D2.4 Multicollinearity.

Firstly, correlations between main model independent variables that were included in the same multivariate analyses (i.e., all preschool model variables and, in some instances, engagement) were examined for possible multicollinearity. A reasonably high correlation was seen between teacher-reported mental health problems and self-concept (r = -.77). However, no multicollinearity was detected within a regression model with teacher-reported self-concept and mental health problems as independent variables - tolerance and variance inflation factor (VIF) values were acceptable (above 0.2 and below 4, respectively). Condition indexes were not above 30, and most importantly, these high correlations did not inflate the standard errors of the regression coefficients. As there were no signs of multicollinearity, and there was no conceptual reason to combine these variables, both metal health problems and self-concept were retained.

D2.5 Linearity and homoscedasticity.

Scatterplots of all variable pairs were examined for linearity and homoscedasticity. All variable combinations showed linear trends. Though the scatter was not perfectly rectangular, the slight heteroscedasticity seen was not considered significant or problematic.

APPENDIX E

ADDITIONAL RESULTS TABLES AND FIGURES

E1 Chapter 5 Additional Results

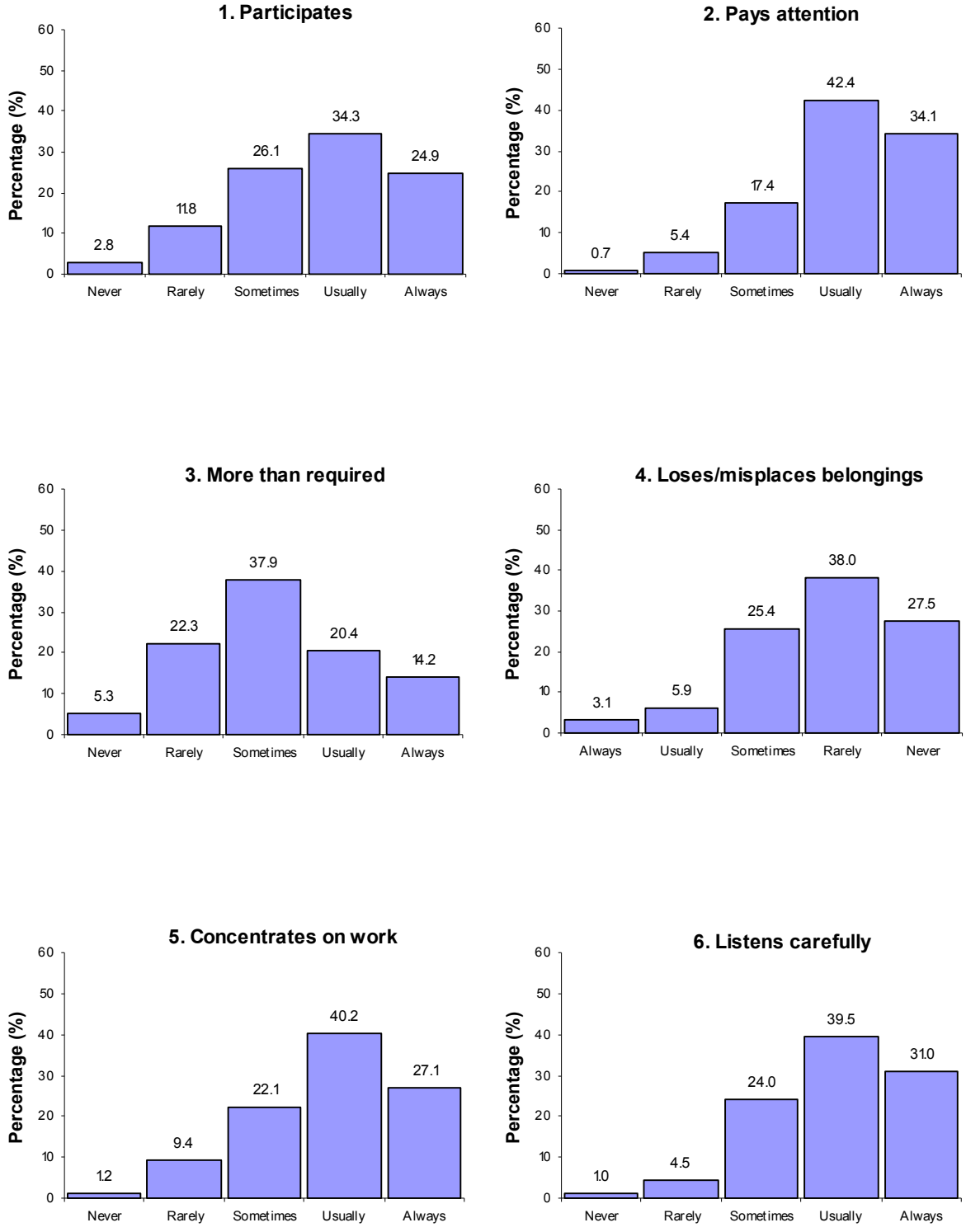


Figure E1. Item response distributions for the 24 items comprising the modified RAPS engagement questionnaire. All X axes are keyed so that responses indicating higher engagement are on the right.

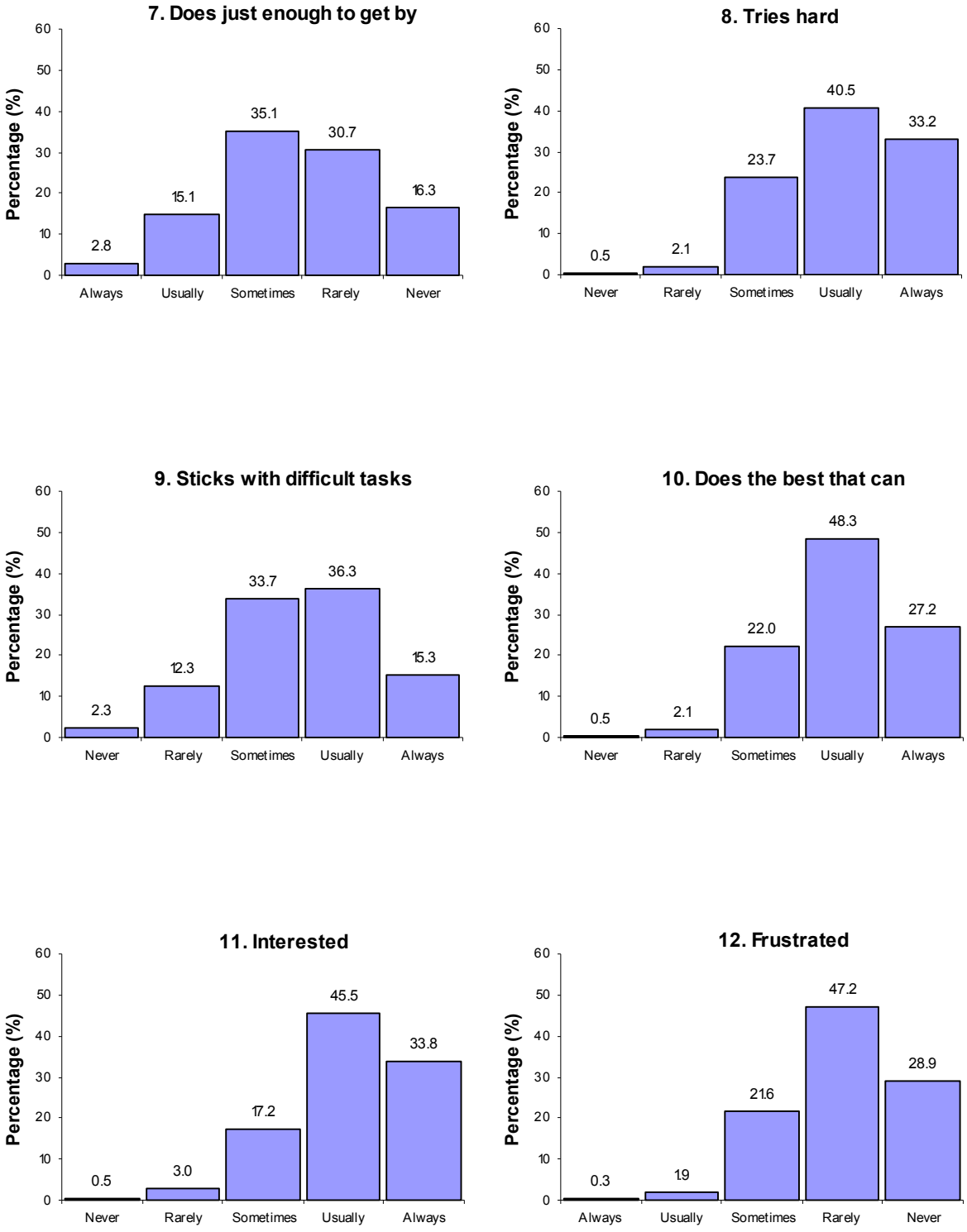


Figure E1 cont. Item response distributions for the 24 items comprising the modified RAPS engagement questionnaire. All X axes are keyed so that responses indicating higher engagement are on the right.

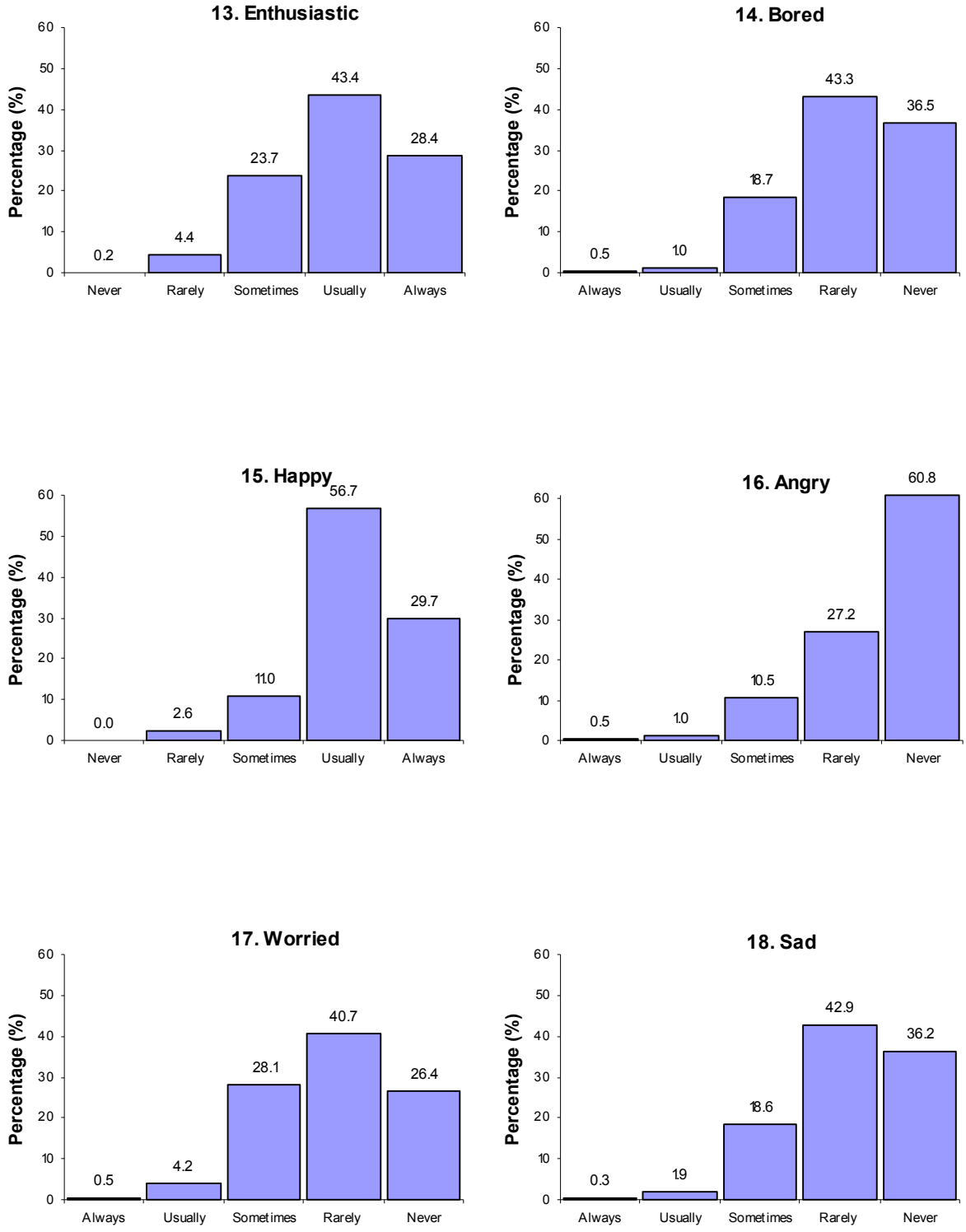
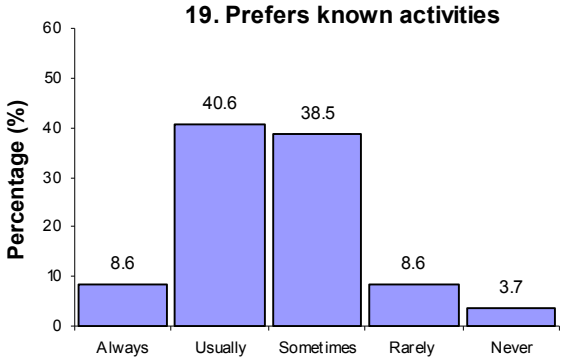
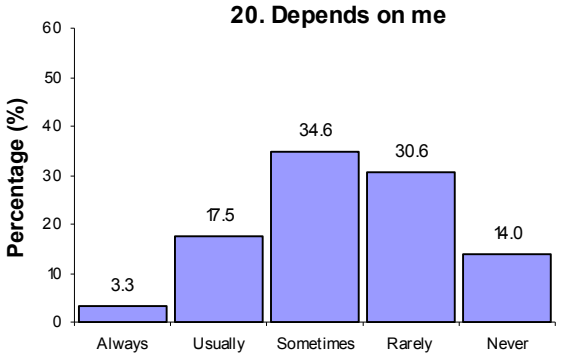
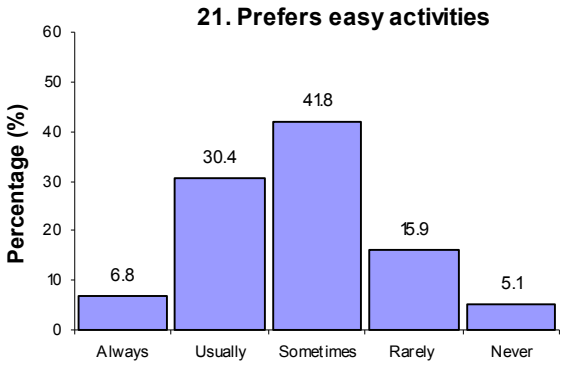
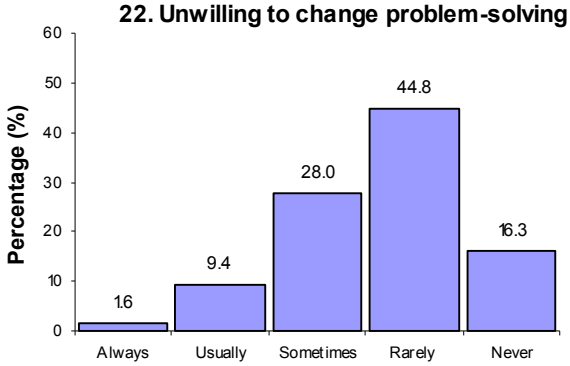


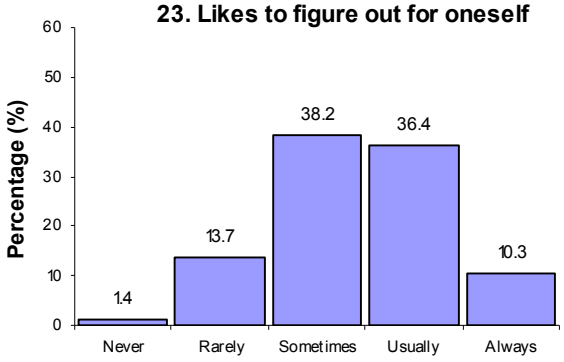
Figure E1 cont. Item response distributions for the 24 items comprising the modified RAPS engagement questionnaire. All X axes are keyed so that responses indicating higher engagement are on the right.











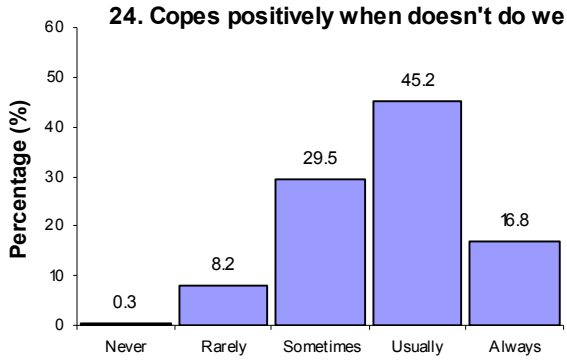


Figure E1 cont. Item response distributions for the 24 items comprising the modified RAPS engagement questionnaire. All X axes are keyed so that responses indicating higher engagement are on the right.

APPENDIX E

Table E1

One-Factor Exploratory Factor Analysis Solution for 17-Item Engagement Questionnaire (n = 547)

Variable	Factor loading	h^2
Sticks with difficult tasks	**.86**	.75
More than required	**.82**	.67
Does the best that can	**.80**	.65
Copes positively when doesn't do well	**.79**	.63
Listens carefully	**.77**	.59
Enthusiastic	**.76**	.57
Likes to figure out for oneself	**.74**	.54
Does just enough to get by	**.72**	.52
Depends on me	**.71**	.51
Prefers easy activities	**.70**	.49
Bored	**.67**	.44
Happy	**.62**	.38
Frustrated	**.62**	.37
Loses/misplaces belongings	**.59**	.35
Angry	**.53**	.28
Sad	**.52**	.27
Worried	**.51**	.26
Percentage variance	51.68	
Eigenvalue	8.79	

Note. Loadings ≥ .40 in bold type. All negatively-worded engagement items were reversed prior to analyses. h^2 = communality coefficient.

Table E2

Rasch Statistics for the 17-Item 1-Factor EFA Solution Engagement Scale (n = 547)

			Response thresholds (logits)				Infit
Item	Location	SE	2	3	4	5	MS
17-item 1-factor EFA solution engagement scale							
3. More than required	1.13	0.22	-1.69	0.28	2.24	3.68	0.88
4. Loses belongings	0.16	0.23	-1.78	-0.94	0.65	2.69	**1.37**
6. Listens carefully	-0.32	0.30	-2.66	-1.47	0.38	2.46	0.84
7. Does just enough to get by	0.66	0.23	-2.19	-0.32	1.58	3.56	1.10
9. Sticks with difficult tasks	0.56	0.24	-2.31	-0.56	1.35	3.74	**0.65**
10. Does the best that can	-0.58	0.38	-3.00	-2.10	0.03	2.77	0.73
12. Frustrated	-0.74	0.41	-3.34	-2.28	0.01	2.66	1.05
13. Enthusiastic	-0.82	0.46	-4.41	-1.81	0.29	2.67	0.82
14. Bored	-0.79	0.40	-2.81	-2.31	-0.21	2.16	1.00
15. Happy	-0.08	0.26	-	-2.13	-0.74	2.64	1.00
16. Angry	-1.23	0.41	-2.80	-2.21	-0.75	0.86	1.17
17. Worried	-0.41	0.34	-3.25	-1.73	0.57	2.77	**1.37**
18. Sad	-0.89	0.41	-3.34	-2.24	-0.16	2.17	**1.30**
20. Depends on me	0.83	0.24	-2.09	-0.12	1.69	3.83	1.05
21. Prefers easy activities	2.00	0.23	-1.50	0.78	3.18	5.51	1.06
23. Likes to figure out for oneself	0.65	0.28	-2.84	-0.58	1.60	4.40	0.93
24. Copes positively	-0.20	0.38	-4.00	-1.21	0.80	3.61	0.77

Note. MS = mean square; SE = standard error. All negatively-worded engagement items were reversed prior to analyses. Misfitting items in bold type.

E2 Chapter 7 Additional Results

Table E3
Path Analysis (parent model) for the Predictors of Reception Engagement (n = 568)

Predictor	R^2 change	*F* change	*df*
Equation 1: DV = Engagement			
Step 1	.084	12.98***	4, 563
Step 2	.050	10.91***	3, 560
Equation 2: DV = Mental health problems			
Step 1	.021	2.96	4, 563
Step 2	.425	215.21***	2, 561
Equation 3: DV = Self-concept			
Step 1	.015	2.10	4, 563
Step 2	.247	187.78***	1, 562

Note. DV = dependent variable. Step 1 for all equations includes the four covariates (terms at school, gender, Aboriginal/Torres Strait Islander origin, and public/private school attendance). Step 2 for all equations includes all model variables that are theoretically prior to the dependent variable.
*** $p < .001$

Table E4
Path Analysis (teacher model) for the Predictors of Reception Engagement (n = 571)

Predictor	R^2 change	*F* change	*df*
Equation 1: DV = Engagement			
Step 1	.080	12.32***	4, 566
Step 2	.085	19.11***	3, 563
Equation 2: DV = Mental health problems			
Step 1	.064	9.64***	4, 566
Step 2	.588	475.98***	2, 564
Equation 3: DV = Self-concept			
Step 1	.064	9.74***	4, 566
Step 2	.353	342.47***	1, 565

Note. DV = dependent variable. Step 1 for all equations includes the four covariates (terms at school, gender, Aboriginal/Torres Strait Islander origin, and public/private school attendance). Step 2 for all equations includes all model variables that are theoretically prior to the dependent variable.
*** $p < .001$

Table E5
Path Analysis (parent model) for the Predictors of Year 1 Disciplinary Action (n = 544)

Predictor	R^2 change	*F* change	*df*
Equation 1: DV = Disciplinary action			
Step 1	.129	19.87***	4, 539
Step 2	.085	14.55***	4, 535
Equation 1: DV = Engagement			
Step 1	.084	12.30***	4, 539
Step 2	.046	9.36***	3, 536
Equation 2: DV = Mental health problems			
Step 1	.017	2.33	4, 539
Step 2	.442	219.78***	2, 537
Equation 3: DV = Self-concept			
Step 1	.016	2.21	4, 539
Step 2	.267	200.08***	1, 538

Note. DV = dependent variable. Step 1 for all equations includes the four covariates (terms at school, gender, Aboriginal/Torres Strait Islander origin, and public/private school attendance). Step 2 for all equations includes all model variables that are theoretically prior to the dependent variable.
*** $p < .001$

Table E6
Path Analysis (teacher model) for the Predictors of Year 1 Disciplinary Action (n = 546)

Predictor	R^2 change	*F* change	*df*
Equation 1: DV = Disciplinary action			
Step 1	.128	19.93***	4, 541
Step 2	.115	20.45***	4, 537
Equation 2: DV = Engagement			
Step 1	.080	11.72***	4, 541
Step 2	.086	18.43***	3, 538
Equation 3: DV = Mental health problems			
Step 1	.059	8.43***	4, 541
Step 2	.586	445.33***	2, 539
Equation 4: DV = Self-concept			
Step 1	.062	8.90***	4, 541
Step 2	.363	341.09***	1, 540

Note. DV = dependent variable. Step 1 for all equations includes the four covariates (terms at school, gender, Aboriginal/Torres Strait Islander origin, and public/private school attendance). Step 2 for all equations includes all model variables that are theoretically prior to the dependent variable.
*** $p < .001$

E3 Chapter 8 Additional Results

Table E7
The Association between Each Individual Risk Variable and Classroom Engagement (n = 526)

Risk variable	*r*
Low maternal educational qualifications	-.20***
Living in single parent households	-.12**
Receipt of a means-tested pension/benefit	-.12**
Paternal employment status	-.10*
Low paternal educational qualifications	-.09*
Stressful life events within the family	-.07
Being born to an adolescent father	-.07
Parental psychological distress	-.05
Maternal employment status	-.04
Being born to an adolescent mother	-.02

Note. Risk variables are scored so that higher values indicate greater risk. *r* = Pearson's correlation coefficient.
*$p < .05$. **$p < .01$. ***$p < .001$.

Table E8
Path Analyses for the Predictors of levels of Educational Resilience

Predictor	R^2 change	*F* change	*df*
Parent-reported variables (*n* = 523)			
Equation 1: DV = Resilience			
Step 1	.098	18.85***	3, 520
Step 2	.038	7.67***	3, 517
Equation 2: DV = Mental health problems			
Step 1	.018	3.13*	3, 520
Step 2	.421	194.21***	2, 518
Equation 3: DV = Self-concept			
Step 1	.006	1.03	3, 520
Step 2	.243	167.63***	1, 519
Teacher-reported variables (*n* = 525)			
Equation 1: DV = Resilience			
Step 1	.094	18.06***	3, 521
Step 2	.072	14.92***	3, 518
Equation 2: DV = Mental health problems			
Step 1	.064	11.91***	3, 521
Step 2	.590	442.11***	2, 519
Equation 3: DV = Self-concept			
Step 1	.068	12.59***	3, 521
Step 2	.358	323.79***	1, 520

Note. DV = dependent variable. Step 1 for all equations includes the three covariates (terms at school, gender, and public/private school attendance). Step 2 for all equations includes all model variables that are theoretically prior to the dependent variable.
*p < .05. ***p < .001.

Table E9
Predictors of Educational Resilience Status using Logistic Regression

Predictor	*B* (β)	S.E.	Wald	Exp(*B*)	95% C.I. Lower	95% C.I. Upper
Parent reported model (*n* = 264)						
Step 1	Block χ^2 (*df* = 3)= 49.34			Nagelkerke R^2 = .23		
Covariates[a]						
Step 2	Block χ^2 (*df* =3)= 21.56			Nagelkerke R^2 = .31		
Covariates[a]						
Parent-child relationship	-0.13	0.16	0.65	0.88	0.64	1.21
Self-concept	0.17	0.19	0.83	1.18	0.82	1.70
Mental health problems	-0.62	0.19	10.29***	0.54	0.37	0.79
Teacher reported model (*n* = 263)						
Step 1	Block χ^2 (*df* = 3)= 48.41			Nagelkerke R^2 = .22		
Covariates[a]						
Step 2	Block χ^2 (*df* = 3)= 29.69			Nagelkerke R^2 = .34		
Covariates[a]						
Teacher-child relationship	0.16	0.22	0.53	1.17	0.76	1.80
Self-concept	-0.11	0.26	0.19	0.89	0.54	1.48
Mental health problems	-0.89	0.28	10.16***	0.41	0.24	0.71

[a]Covariates were adjusted for, but their unique effects are not displayed.
**p < .01. ***p < .001.

Table E10

Path Analyses Predicting Mental Health Problems and Self-concept for Resilient and Vulnerable children

Predictors	R^2 change	*F* change	*df*
Parent model (*n* = 264)			
Equation 2: DV = Mental health problems			
Step 1	.028	2.47	3, 260
Step 2	.369	78.81***	2, 258
Equation 3: DV = Self-concept			
Step 1	.009	0.76	3, 260
Step 2	.174	55.05***	1, 259
Teacher model (*n* = 263)			
Equation 2: DV = Mental health problems			
Step 1	.113	10.95***	3, 259
Step 2	.555	214.59***	2, 257
Equation 3: DV = Self-concept			
Step 1	.103	9.96***	3, 259
Step 2	.364	176.68***	1, 258

Note. DV = dependent variable. Step 1 for all equations includes the three covariates (terms at school, gender, and public/private school attendance). Step 2 for all equations includes all model variables that are theoretically prior to the dependent variable.
***$p < .001$.

Table E11

Path Analyses (teacher model) Predicting level of Educational Resilience for Low- and High-Risk Groups

Predictors	R^2 change	*F* change	*df*
Low-risk children (*n* = 175)			
Equation 1: DV = Resilience			
Step 1	.155	10.48***	3, 171
Step 2	.031	2.17	3, 168
Equation 2: DV = Mental health problems			
Step 1	.043	2.57	3, 171
Step 2	.532	105.62***	2, 169
Equation 3: DV = Self-concept			
Step 1	.073	4.47**	3, 171
Step 2	.253	63.37***	1, 170
High-risk children (*n* = 179)			
Equation 1: DV = Resilience			
Step 1	.084	5.37***	3, 175
Step 2	.084	5.77***	3, 172
Equation 2: DV = Mental health problems			
Step 1	.129	8.62***	3, 175
Step 2	.559	154.53***	2, 173
Equation 3: DV = Self-concept			
Step 1	.096	6.22***	3, 175
Step 2	.336	103.10***	1, 174

Note. DV = dependent variable. Step 1 for all equations includes the three covariates (terms at school, gender, and public/private school attendance). Step 2 for all equations includes all model variables that are theoretically prior to the dependent variable.
**$p < .01$. ***$p < .001$.

Table E12

Path Analyses (parent model) Predicting level of Educational Resilience for Low- and High-Risk Groups

Predictors	R^2 change	*F* change	*df*
Low-risk children (*n* = 175)			
Equation 1: DV = Resilience			
Step 1	.168	11.47***	3, 171
Step 2	.010	0.68	3, 168
Equation 2: DV = Mental health problems			
Step 1	.031	1.83	3, 171
Step 2	.443	71.18***	2, 169
Equation 3: DV = Self-concept			
Step 1	.033	1.97	3, 171
Step 2	.191	41.95***	1, 170
High-risk children (*n* = 178)			
Equation 1: DV = Resilience			
Step 1	.085	5.39***	3, 174
Step 2	.131	9.52***	3, 171
Equation 2: DV = Mental health problems			
Step 1	.013	0.74	3, 174
Step 2	.459	74.41***	2, 172
Equation 3: DV = Self-concept			
Step 1	.003	0.19	3, 174
Step 2	.246	56.65***	1, 173

Note. DV = dependent variable. Step 1 for all equations includes the three covariates (terms at school, gender, and public/private school attendance). Step 2 for all equations includes all model variables that are theoretically prior to the dependent variable.
***$p < .001$.

Table E13

Path Analyses (teacher model) Predicting level of Educational Resilience for Low- and High-Parent-Child Relationship Quality Groups

Predictors	R^2 change	*F* change	*df*
High parent-child relationship quality (i.e., low risk) (*n* = 168)			
Equation 1: DV = Resilience			
Step 1	.166	10.84***	3, 164
Step 2	.045	3.08*	3, 161
Equation 2: DV = Mental health problems			
Step 1	.043	2.43	3, 164
Step 2	.612	143.76***	2, 162
Equation 3: DV = Self-concept			
Step 1	.081	4.80**	3, 164
Step 2	.310	82.95***	1, 163
Low parent-child relationship quality (i.e., high risk) (*n* = 164)			
Equation 1: DV = Resilience			
Step 1	.126	7.70***	3, 160
Step 2	.203	15.80***	3, 157
Equation 2: DV = Mental health problems			
Step 1	.088	5.12**	3, 160
Step 2	.577	136.01***	2, 158
Equation 3: DV = Self-concept			
Step 1	.120	7.29***	3, 160
Step 2	.294	79.69***	1, 159

Note. DV = dependent variable. Step 1 for all equations includes the three covariates (terms at school, gender, and public/private school attendance). Step 2 for all equations includes all model variables that are theoretically prior to the dependent variable.
*$p < .05$. **$p < .01$. ***$p < .001$.

E4 Chapter 9 Additional Results

Table E14
Functions at Group Centroids within Discriminant Function Analysis (n = 278)

	Function	
Adaptation group	1	2
Resilient (*n* = 60)	-.29	.41
Vulnerable (*n* = 80)	.53	-.09
Competent (*n* = 83)	-.43	-.27
Under-achieving (*n* = 55)	.19	.10

Note. Function centroid values are the unstandardised canonical discriminant functions evaluated at group means.

Table E15
Logistic Regression for Predictors of Resilient Group Status among High-Risk Children (n = 140)

					95% C.I.	
Predictors	B (β)	S.E.	Wald	Exp(B)	Lower	Upper
Parent reported model						
Step 1	Block χ^2 (*df* = 3) = 9.68			Nagelkerke R^2 change =.09		
Covariates[a]						
Step 2	Block χ^2 (*df* = 3) = 21.62			Nagelkerke R^2 change = .18		
Covariates[a]						
PCR	-.28	.23	1.43	.76	.48	1.20
Self-concept	.81	.28	8.67**	2.25	1.31	3.86
MH	-.34	.28	1.51	.71	.42	1.22
Teacher reported model						
Step 1	Block χ^2 (*df* = 3) = 9.68			Nagelkerke R^2 change = .09		
Covariates[a]						
Step 2	Block χ^2 (*df* = 3) = 15.37			Nagelkerke R^2 change = .13		
Covariates[a]						
TCR	-.04	.27	.02	.96	.56	1.65
Self-concept	-.22	.30	.56	.80	.45	1.43
MH	-1.01	.36	8.01**	.37	.18	.73

Note. PCR = parent-child relationship; MH= mental health problems; TCR = teacher-child relationship.
[a]Covariates were adjusted for, but their unique effects are not displayed.
**$p < .01$.

Table E16

Continuous Regression for Predictors of Self-Concept and Mental Health Problems among High-Risk Children (n = 140)

Predictors	R^2 change	*F* change	*df*
Parent model			
Equation 2: DV = Mental health problems			
Step 1	.04	1.63	3, 136
Step 2	.46	61.00***	2, 134
Equation 3: DV = Self-concept			
Step 1	.02	1.01	3, 136
Step 2	.19	32.71***	1, 135
Teacher model			
Equation 2: DV = Mental health problems			
Step 1	.12	6.36***	3, 136
Step 2	.53	102.36***	2, 134
Equation 3: DV = Self-concept			
Step 1	.11	5.45**	3, 136
Step 2	.27	58.01***	1, 135

Note. DV = dependent variable. Step 1 for all equations includes the three covariates (terms at school, gender, and school type (public/private).
**$p < .01$. ***$p < .001$.

APPENDIX F

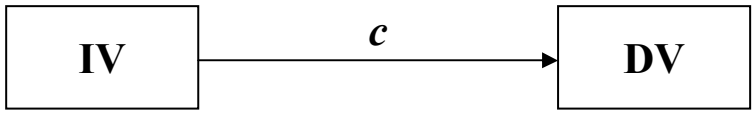
OVERVIEW OF THE APPROACH USED TO TEST FOR MEDIATION

F1 The Causal Steps Approach

The basic causal chain involved in mediation (Baron & Kenny, 1986) is shown in Figure F1. According to Baron and Kenny (1986), and as updated by Kenny, Kashy and Bolger (1998), there are four steps (involving three regression equations) in establishing mediation. First, the independent variable (IV) must significantly predict the dependent variable (DV) (path *c*), shown by using the IV as the predictor and the DV as the criterion in a regression equation. This step effectively establishes that there is an effect to be mediated. Second, the independent variable must significantly predict the mediator variable (MV) (path *a*), established by treating the MV as the criterion and the IV as the predictor in a regression equation. Third, the MV must significantly and uniquely predict the DV (path *b*), by using the DV as the criterion, and both the MV and the IV as predictors in a regression equation. The IV must be included to demonstrate that the MV and DV are not related simply due to both being caused by the IV. Fourth, after controlling for the MV, the association between the IV and DV must be significantly reduced (path *c*′). The effects in both steps 3 and 4 are estimated in the same regression equation. If all four steps are met, and path *c*′ is non-significant, then full mediation is said to occur. In this way, the IV only has an indirect effect on the DV, through its effect on the MV. However, if all four steps are met, but path *c*′ remains significant, then partial mediation is said to have occurred. In this way, the IV has both a direct effect on the DV, and an indirect on the DV, via the MV.

However, the causal steps approach (Baron & Kenny, 1986) has been criticised for several reasons. First, some researchers feel it is not necessary to establish Step 1 - that is, that there is an overall effect to be mediated (Collins, Graham, & Flaherty, 1998; MacKinnon, Krull, & Lockwood, 2000; MacKinnon, Lockwood, Hoffman, West, & Sheets, 2002; Shrout & Bolger, 2002). This is because adhering to Step 1 means that distal mediation effects and suppression effects (otherwise known as inconsistent mediational models) cannot be detected. Consequently, keeping Step 1 may result in making a type II error for the whole mediation system (Shrout & Bolger, 2002). Second, the causal steps approach establishes the conditions necessary for mediation, but does not provide a

A



B

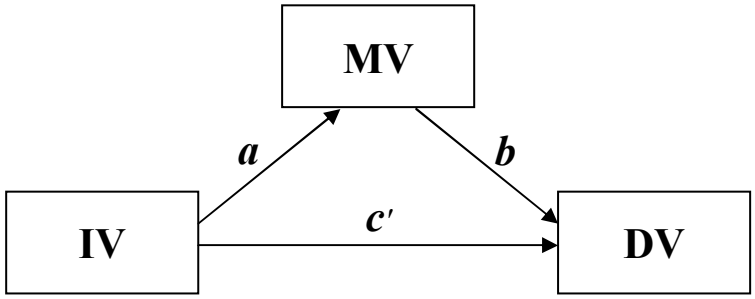


Figure F1. Panel A illustrates the total effect (path *c*) of an independent variable (IV) on a dependent variable (DV). Panel B illustrates a mediated process, whereby the IV affects the DV indirectly (path *ab*), through the mediating variable (MV). When mediation occurs, *c′* (the direct path) is smaller than *c* (the total path). Adapted from Preacher and Hayes (2004) and Shrout and Bolger (2002).

statistical test of the mediated effect. Finally, due to the use of three separate regressions, this approach has lower power. This especially applies to the third and fourth steps, as two IVs are entered into the equation. To address these limitations, two approaches were taken within this thesis that differed slightly from the causal steps approach.

First, although Step 1 will be tested for all mediational chains, it will not be considered a necessary criterion, and will be evaluated on a case-by-case basis. As an example, when the process to be mediated is temporally distal (i.e., measurement of the IV and DV is separated by a one-year period), a statistically significant link between the IV and DV need not be established to proceed with further tests of mediation.

Second, the strength and significance of the indirect effect will also be estimated directly using a single test, derived by Sobel (Sobel, 1982). The Sobel test has more power

than the causal steps approach, and so is less likely to result in a Type II error (MacKinnon et al., 2002; Preacher & Hayes, 2004). As the exact amount of the indirect effect is defined as the reduction of the effect of the IV on the DV after the MV is controlled (or *c* - *c'*), then within ordinary least squares regression, this difference in coefficients is exactly the same as the product of path *a* (IV → MV) and path *b* (MV → DV). Consequently, the significance of the indirect effect (path *ab*) can be computed from the product of these path coefficients using the Sobel test statistic, which tests whether this indirect path is significantly different from zero. The Aroian version (Aroian, 1944) of the Sobel test is recommended, converging closely with the Sobel test statistic in large samples (Baron & Kenny, 1986; MacKinnon et al., 2002; MacKinnon, Warsi, & Dwyer, 1995). Both the Sobel and Aroian statistics were computed for all three-variable chains, but scores converged closely, with no difference in significance test results. Consequently, only the Aroian version is reported in this thesis.

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