Comparing early parental warmth and effective management as predictors of child conduct and emotional problems

Thesis submitted for the degree of Doctor of Philosophy in Social Intervention

Social Sciences Division at the University of Oxford

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Trinity Term 2016



Abstract

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Introduction: Identifying aspects of parenting that are protective for child emotional and behavioural outcomes is important for informing parenting intervention. Attachment theory and social learning theory represent two major theories that propose different mechanisms for how parenting influences child functioning. The aim of this study was to compare dimensions of early positive parenting associated with these two theoretical frameworks as predictors of child conduct and emotional problems.

Method: Data were from a US based longitudinal study (the Early Steps study, Dishion et al., 2008) following a sample of 731 toddlers from age 2 to 7.5, from low income families and at high risk of early onset of child problem behaviours. Associations between observed parenting (age 2-3 and age 5) and parent reported child externalising and internalising behaviour (age 3, 4, 5 and 7.5) were examined in structural equation models.

Results: Parenting related to attachment theory ('warmth') had little short-term association with child outcomes, but over time this parenting dimension increasingly predicted lower levels of child problems. Parenting associated with social learning theory ('effective management') was related to lower child conduct and emotional problems short-term, but in the long-term it had no predictive effect on child functioning.

Discussion: Differences between parenting dimensions in terms of their respective short-term and long-term effects might be explained by the underlying mechanisms linking parenting and child outcomes. Attachment theory emphasises internal and emotional processes, and these may be slow building but more enduring. Social learning theory proposes that behaviours are driven largely by external motivations and inspirations, and these might be relatively instantaneous but short-lived.

Conclusion: Results of this study indicate that early childhood parenting associated with attachment theory is an important protective factor for children's longitudinal outcomes. For enhancing longer term, more enduring outcomes, it is likely that parent intervention and prevention programmes in early childhood should emphasise programme components drawing on attachment theory. However, it would be necessary to test this before making any firm recommendations.

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"All of us, from cradle to grave, are happiest when life is organized as a series of excursions, long or short, from the secure base provided by our attachment figure(s)"

- John Bowlby, 1988

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Abbreviations

ADHD	Attention deficit/hyperactivity disorder
CBCL	Child behaviour check list
CD	Conduct disorder
CFA	Confirmatory factor analysis
CFI	Comparative fit index
COIMP	Coder Impressions Inventory
DSM	Diagnostic and Statistical Manual of Mental Disorders
EFA	Exploratory factor analysis
FCU	Family Check-Up
FIML	Full information maximum likelihood
HOME	Home Observation for Measurement of the Environment
ICD	International Classification of Diseases
LGCM	Latent growth curve modelling
LMS	Latent moderated structural equation method
MAR	Missing at random
MCAR	Missing completely at random
MLR	Robust maximum likelihood
MMD	Major depressive disorder
MNAR	Missing not at random
MVA	Missing variable analysis
OCD	Obsessive compulsive disorder
ODD	Oppositional defiant disorder
RACS	Relationship Affect Coding System
RCT	Randomised controlled trial
rGE	Gene-environment correlation
RMSEA	Root mean square of approximation
SEM	Structural equation modelling
SRMR	Standardized root mean square residual
SSP	Strange Situation Procedure
TLI	Tucker-Lewis index
WLSMV	Weighted least square with mean and variance adjustment
WRMR	Weighted root mean square residual

INTRODUCTION

Child conduct and emotional problems have been found to be widespread, with a prevalence of around 6% for conduct disorders and 4% for emotional disorders (Green et al., 2005). Moreover, these problems impact on everyday aspects of children's lives such as education, social skills and peer relationships (Dodge, 1983; Maguin & Loeber, 1996; McGee et al., 1988; Rapport et al., 2001; Reijntjes et al., 2010), and they are predictive of later and more severe adult outcomes (Geller et al., 2001; Fergusson et al, 2005; Simonoff et al., 2004; Woodward & Fergusson, 2001). Although a range of risk factors have been demonstrated to be associated with these child outcomes, including genetic factors and gene environment interactions, parenting has been found to be significant for child functioning (Moffit, 2005) McLeod et al., 2007a, 2007b; Rothbaum & Weisz, 1994). It is therefore sensible that parenting remains a main focus in prevention and intervention that address child conduct and emotional problems. Research that informs which aspects of parenting practice are influential for enhancing child outcomes is highly relevant.

Two major theories in relation to parenting practice and child development are attachment theory and social learning theory. These theoretical approaches offer different models for explaining how parenting practices affect children's development. Attachment theory highlights the internal processes and emotional aspects of the parent-child relationship which shape the child's internal working models and guide behaviours (Bowlby, 1969; Ainsworth et al., 1978). Social learning theory takes a behaviourist approach by emphasising the external controls and motivations through which child behaviour is learnt and reinforced within everyday repeated parent-child interactions (Gardner, 1987; Patterson, 1982). Therefore, the processes and mechanisms linking parenting practices to child behavioural outcomes constitute a significant point of contention between these two

theoretical frameworks. This is to the extent that many social learning concepts related to child conduct problems can be explained entirely from an attachment perspective, and vice versa, social learning can account for the formation of attachment. The disagreement between the two perspectives is essentially a question of whether parental behaviours set in motion social learning processes or whether they activate the attachment system. In practice the key difference between the two perspectives is whether parents are responsive to *child needs* by providing warm and affectionate care as highlighted in attachment theory; or whether parents are responsive to *child behaviours* by rewarding and encouraging good behaviours and setting limits and sanctions on undesirable child conduct, as suggested in social learning theory. These theories also differ in terms of their relevance for different developmental stages; with attachment theory having a strong focus on infancy and social learning theory becoming more relevant from toddlerhood and onwards (Erikson, 1950). In reality these dimensions of parenting may often accompany each other, as suggested by O'Connnor (2002), who points out that parents who are responsive to child needs by being warm and affectionate also tend to be responsive to child behaviour by using effective management strategies. As proposed in some models of child development, both parenting dimensions may be influential and they may interact in predicting child outcomes (Baumrind, 1966; Greenberg et al., 1993; Shaw & Bell, 1993; Richters & Waters, 1991).

Currently very little research has compared and contrasted these two theoretical aspects of parenting in terms of their association with child functioning; with the evidence being especially limited with regards to children's long-term outcomes. Neither has there been much explicit exploration of whether these parenting dimensions are jointly associated with child functioning. The main aims of this study are: 1) to examine and compare parenting associated with attachment theory and with social learning theory as predictors of child conduct and emotional problems; 2) to study these two theoretical parenting

dimensions as complementary factors that interact in predicting child outcomes, and 3) to investigate the extent to which early parenting during the toddler years has enduring effects on child outcomes, over and above later parenting at early school age.

This doctoral study expands upon the small number of existing empirical studies that have factored out parenting from attachment theory and social learning theory and examined their association with child functioning. Furthermore, it addresses several of the limitations of previous examinations and therefore provides a more robust investigation. This study examines the two dimensions of parenting in the same analytical steps and thereby directly compares the unique contribution of each aspect of parenting to child outcomes. By also testing interactions between parenting constructs it adds a novel insight into how attachment and social learning aspects may be interconnected in influencing child functioning. The examination of bidirectional effects in this study contributes further to this emerging body of research on reciprocal parent-child effects. Methodologically this study has a number of strength and advances. It uses a longitudinal design with regular follow-ups of a large sample of children, all recruited at age 2, and their parents. This allows examination of early parenting as a predictor of child outcomes at different points in developmental time, and as a predictor of the development of child problems over time. The use of structural equation modelling, including latent growth curve modelling and autoregressive cross-lagged modelling, provides advanced analyses of longitudinal data. In this study, parenting is observed and not reported by parents themselves, and therefore the measures of parenting used are potentially more reliable and independent. Observed parenting also means that there is no method overlap with measures of child outcomes, which are parent reported, and therefore methods bias in results is reduced. Other strengths of this study that minimise bias and provide a more independent estimate of parent effects are the inclusion of a number of

relevant covariates, including child's previous behaviour problems, parent depression, and a number of demographic and socio-economic factors.

It is interesting from a purely theoretical point of view to establish whether parental practices based on attachment theory or those related to social learning principles best predict child functioning. Although, from the perspective of prevention and intervention, it is of even greater importance to identify the practices and mechanisms which most effectively, and with long-terms effects, affect child behavioural and emotional functioning. Especially in high risk populations that are more vulnerable to child adjustment problems and who are more likely to be consumers of parenting interventions. Such insight could help inform the development of more effective interventions, with effects that are durable and that impact on long-term child functioning. It is hoped that this doctoral thesis will contribute to the advancement of such knowledge in the field of parenting prevention and intervention.

0.1. Overview of thesis

Chapter one provides an outline of child conduct and emotional problems including epidemiological aspects such as prevalence, comorbidity, prognosis and risk factors. Drawing on empirical evidence it is demonstrated that parenting is an important factor in predicting these childhood problems.

Chapter two presents the main features of attachment theory and social learning theory, including the kinds of parenting practices associated with these respective theories. It is suggested that there is some degree of convergence as well as points of divergence between these frameworks, and that they can be seen as competing theories that offer rivalling mechanisms as to how parenting impacts on children. It is demonstrated how social learning can be interpreted from an attachment perspective, and vice versa, how attachment can be explained within a social learning framework. There will also be an outline of developmental theories that suggest ways that attachment and social learning may

complement each other and interact in influencing child functioning. A summary of findings from the very few existing studies that have compared social learning and attachment parenting and in terms of their relationship to child functioning is provided. Lastly the research aims and questions of the current study are presented.

Chapter three describes the methodology of the study, including research design, sample, assessment procedures, measures, handling missing data, and strategies for data analysis. Ethical considerations are also outlined.

Chapter four reports results of preliminary analysis, including descriptive statistics of sample demographics and other characteristics. Results of exploratory and confirmatory factor analysis are presented. Unconditional growth curve models and longitudinal autoregressive measurement models are tested in terms of their suitability for further analyses that address the main research questions of the thesis. The appropriateness of using the whole study sample is also tested, and bivariate correlations between study variables are described.

Chapter five presents results of examinations of the main research questions of this study and is structured in two parts. Part one reports results for research questions one to four, which focus on parenting related to attachment theory and to social learning theory when children are of toddler age (2-3 years). Part two reports results in relation to research questions five to seven, which examine enduring effects of parenting at toddler age (age 2-3) over and above later parenting at early school age (age 5). Additional analyses that examine bidirectional effects are also presented.

Chapter six discusses the empirical findings of this study in light of the background literature and previous research, and in terms of implications for parenting intervention. Strengths and limitations of the study are highlighted, and recommendations for further research to advance the field are proposed.

CHAPTER 1: Child conduct and emotional problems

This thesis focuses on children's conduct and emotional problems and it is therefore useful to briefly outline how these are defined, the prevalence of these problems, and some of the aetiological factors thought to contribute to the development of these problems.

1.1. Child conduct problems

Conduct problems refer to children's outward negative, antisocial and aggressive behaviours. A wide range of different terms and definitions exist depending on field and perspective (Hinshaw & Lee, 2003). From a legal and criminological perspective children's antisocial behaviours are referred to as 'delinquency'. In the field of psychology, terms such as 'externalising', 'acting out', 'disruptive' and 'under-controlled' are used to describe these child behaviours, and these are generally considered as being on a continuum rather than categorical. In psychiatry on the other hand, clinical levels of child behavioural problems are categorised according to very specific criteria such as those specified in the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) (American Psychiatric Association, 2013). The DSM-5 identifies two childhood specific disruptive behaviour disorders; 'oppositional defiant disorder' (ODD) and 'conduct disorder' (CD). ODD refers to developmentally inappropriate levels of irritable, argumentative, and defiant behaviours, and diagnosis requires 4 out of 8 symptoms that must be present for at least 6 months. ODD is seen in younger children and has an average age of onset of 6 years. CD is a more severe variant of childhood disruptive behaviour disorder and tends to involve slightly older children, with an average age of onset of 9 years. CD is characterised by behaviour that violates the rights of others or major age-appropriate societal norms. A diagnosis of CD requires 3 out of 15 more serious behavioural symptoms of aggression, vandalism, deceitfulness/theft, or serious

violation of rules, that have been present in the last 12 months with at least one symptom being present in the last 6 months (American Psychiatric Association, 2013; Hinshaw & Lee, 2003; Lahey & Loeber, 1997). In previous versions of the DSM, 'attention deficit/hyperactivity disorder' (ADHD) was grouped with conduct disorders, but is banded with neurodevelopmental disorders in the current DSM. ADHD refers to developmentally inappropriate levels of inattention, hyperactivity, and impulsivity, and children must present at least 6 symptoms from either or both of the attention and hyperactivity/impulsivity criteria. Most children with CD will have met ODD criteria at an earlier developmental stage, and these disorders have very similar aetiology with risk factors being largely external or environmental (Boden et al., 2010). This is in contrast to ADHD which often overlaps with conduct disorders, but etiological factors involved in the development of ADHD are more strongly heritable (Taylor & Sonuga-Barke, 2008), although ADHD and disruptive behaviour disorders also share many risks factors (Hinshaw & Lee, 2003). Risk factors will be further outlined later in this chapter.

1.2. Child emotional problems

Emotional problems are commonly described as internalising behaviours as they are directed inwardly at the self, opposed to externalising behaviours which are outwardly directed as described above. Emotional problems include anxious, fearful, depressive, withdrawn, and over-controlled behaviours. Emotional or internalising problems therefore refer to a wide range of symptoms, and amalgamate what from a clinical perspective would be defined as separate disorders. Clinically defined emotional disorders are grouped into the two main categories 'anxiety disorders' and 'depressive disorders', and each of these have further subcategories.

Anxiety disorders in the DSM-5 are: 'generalized anxiety', 'specific phobia', 'social anxiety', 'separation anxiety', 'panic disorder', 'agoraphobia', and 'selective mutism' (American Psychiatric Association, 2013). In previous versions of the DSM, 'obsessive compulsive disorder' (OCD) and 'posttraumatic stress disorder' (PTSD) were classified under anxiety disorders but these now have their own respective categories. A defining feature of anxiety is dysregulation of the anxiety response system that is manifested by intense fear reaction (Weems & Silverman, 2013). Weems distinguishes between primary and secondary features of anxiety (Weems, 2008). Primary features can be present in all anxiety disorders and refer to general ways that anxiety is manifested, such as behaviourally (e.g. avoidance), cognitively (e.g. concentration difficulties), physiologically (e.g. heart rate), or interpersonally (e.g. problems making friends). Secondary defining features are particular to each anxiety disorder and specify the direction of the excessive worry or fear; e.g. in 'separation anxiety disorder' the child is concerned about the separation from its parents. In the latest DSM-5 there are no anxiety disorders that are unique to childhood, unlike in previous versions where 'separation anxiety disorder', 'avoidant disorder of childhood and adolescence' and 'overanxious disorder' were considered exclusive to childhood (American Psychiatric Association, 2013).

Depressive disorders on the DSM-5 are characterised by persistent depressed or irritable mood, or loss of interest or pleasure in daily activities, and addition a number of other symptoms must also be present (change in weight, sleep problems, retardation, fatigue, feeling of worthlessness/guilt, reduced concentration/decisiveness, suicidal thought). Classification of depressive disorders is on a continuum, depending on the number of symptoms and their duration. 'Major depressive disorder' (MDD) requires at least five symptoms to be present for more than two weeks; whilst 'minor depressive disorder' involves between two and three symptoms. 'Persistent depressive disorder' signifies a

chronic form of depression of three or more symptoms lasting for at least a year. 'Disruptive mood dysregulation disorder' (DMDD), also labelled 'childhood bipolar', is distinctive to childhood and adolescence, and is characterised by persistent irritable or angry mood with frequent episodes of extreme temper outbursts, with symptoms being observable for 12 months or more (American Psychiatric Association, 2013; Brent & Weersing, 2008; Klein et al., 2013). For clinical diagnosis of a depressive disorder, it is required that symptoms impair child functioning such as social relationships, education, or other important area of life. In terms of age specific manifestations, symptoms of MDD have been shown to be quite similar at school-age, in adolescence, and in adulthood (Weiss & Garber, 2003), and this is also reflected in DSM-5 criteria, which differentiate very little between child and adult disorders (American Psychiatric Association, 2013). As for preschool age depression, there is a scarcity of research, and it was previously thought that very young children are unable to experience depression (Cowan, 1978; Harter, 1986), or that they would express depression only indirectly through somatic complaints or aggression, referred to as 'masked depression' (Lesse, 1983). However, more recent empirical research has indicated that very young children tend to express depression directly rather than indirectly (Luby et al., 2003). Although, for preschool MDD it has been recommended that the duration criteria should be shortened as modifying these criteria has been demonstrated to be highly predictive of later school-age MDD (Luby et al., 2009a). Research has also indicated that although depression impacts child functioning, depressed preschoolers are not yet cognitively impaired and therefore the detection of early childhood depression is important from the perspective of early intervention and prevention (Luby et al., 2009b).

1.3. Prevalence

Children's behavioural and emotional problems are a cause for concern as evidence suggests that these problems are widespread. One of the most comprehensive studies surveying nearly 8000 children and adolescents aged 5 to 16 in Great Britain (Green et al., 2005), reported that 9.6% had a clinically diagnosed mental disorder as defined by the ICD-10 (International Classification of Diseases, version ten). Most common were conduct disorders with a prevalence of 5.8% (ODD 3%, CD 2.8%), this was followed by emotional disorders experienced by 3.7% (anxiety 3.3%, depression 0.9), and 1.5% had hyperkinetic disorder, which is a more severe type of ADHD. In a similar prevalence study of 8-15 year olds in a large US sample (N=3042) (Merikangas et al., 2010), it was found that 13.1% of children and adolescents had a mental disorder. The highest prevalence rate was for ADHD (8.6%), followed by depressive disorders (3.7%), conduct disorders (2.1%), and anxiety disorders (0.7%).

However, reviews and meta-analyses report large variation in prevalence amongst studies, for example Lahey et al. (1999) found that prevalence of ODD ranged from 1% to 20%, with a median of 3%; and CD ranged from 1% to 10%. In a meta-analysis of studies that used structured diagnostic interviews to make formal diagnoses of depression on representative population samples of participants up to age 18, Costello et al. (2006) reported a prevalence of 2.8% for children under 13, and 5.6% for adolescents. A meta-analysis with a similar methodology for anxiety disorders found a prevalence of 12.3% for children aged 6-12, and 11% for adolescents (Pine & Klein, 2008). Variation in prevalence across studies can be down to a number of factors, such as the clinical criteria and assessment used, the number and type of informants, and the time frame (Loeber et al., 2000). One of the most significant factors in prevalence studies is the representativeness of the sample in relation to

the general population of children. Both the UK and US studies referred to above are considered large and representative.

Prevalence studies have demonstrated that child conduct and emotional problems vary according to gender and age of child. When children are very young there is virtually no gender difference in prevalence of conduct problems, but from late preschool age boys become more likely than girls to meet clinical criteria for conduct disorders, and gender differences then weaken again in adolescence when girls tend to increase their antisocial behaviour (Gardner & Shaw, 2008; Green et al., 2005; Hinshaw & Lee, 2003, Lahey et al., 2006). For emotional disorders there is no gender difference in childhood, but when reaching adolescence girls have a higher prevalence of emotional disorders compared to boys (Green et al., 2005; Hyde et al., 2008). An established trend for both conduct and emotional disorders is that these become more prevalent as children enter adolescence (Green et al., 2005; Merikangas et al., 2010).

The current study assesses conduct and emotional problems in a sample of toddlers aged two with follow-ups at age 3, 4, 5 and 7 ½, and thereby covering several child developmental stages: toddler, preschool, and school age. Most large scale prevalence studies on children's conduct and emotional problems include children from school age and onwards, whilst there is less attention to these problems in relation to very young children (Campbell, 1995; Lavigne et al., 1996; Egger & Angold, 2006). A reason for the lack of attention to conduct problems in toddlers and preschool children may be because acting out is common behaviour in very young children. Especially in toddlers (age 1-3), behaviours such as defiance, aggression, tantrums, stubbornness and reactivity are relatively normal, and such behaviours can even be considered a sign of healthy child development as the child starts to develop autonomy from its parent(s) (Campbell, 2006; Erikson, 1950). In normally developing children these behaviours attenuate during the preschool years (Campbell et al.,

1995). Where these problems are persistent beyond the preschool years it is symptomatic of ODD, and if problems become more severe later in childhood it is indicative of CD (Hinshaw & Lee, 2003). As suggested by Gardner & Shaw (2008), the lack of focus on emotional problems in very young children may be for reasons such as the difficulty for young children to communicate their emotions, and because adults may not consider these behaviours as problematic, or adults may not be able to distinguish normal levels of child anxiety and distress from disorderly levels.

Studies that have examined emotional and behavioural problems in toddlers and preschool children have demonstrated that conduct and emotional disorders are highly prevalent in this population of children. Early studies of prevalence of problem behaviours in preschoolers tended to measure these using clinical cut off scores on checklists such as the CBCL. Across these studies, Campbell (1995) reported that 10-15% of preschoolers experience mild to moderate problems. It should be noted that these studies focus predominately on externalising behaviours whilst internalising behaviours are often excluded. Later prevalence studies used DSM criteria measures for the assessment of disorders in toddlers and preschool children and many of these studies have included also emotional disorders. These later studies have shown prevalence rates of 14-28% for any disorder, 9-15% for behavioural disorder; and 10-20% for emotional disorders, which is largely anxiety disorders as the prevalence of depression is very low across studies (0-2%) (Bufferd et al., 2012; Earls, 1982; Egger & Angold, 2006; Keenan et al., 1997; Lavigne et al., 1996; Lavigne et al., 2009). As noted above, it has only recently been acknowledged that preschool children express depressive symptoms (Luby et al., 2003) and a modified criteria of diagnosis is recommended for this age group (Luby et al., 2009a).

1.4. Comorbidity

Although conduct and emotional disorders are quite different in terms of their respective external and internal expression, research has demonstrated that there is a great deal of comorbidity of these child problems. A meta-analysis of studies with community samples found that children and adolescence with ODD/CD were 6.6 times as likely to also meet diagnostic criteria for a depressive disorder, and 3.1 times as likely to experience anxiety, and figures were similar for children with ADHD who were 5.5 time more likely to be depressed and 3.0 times more likely to have an anxiety disorder (Angold et al., 1999). There is evidence to suggest that comorbidity of conduct and emotional problems acts as an amplifier, as demonstrated in a study that found that boys with comorbid ODD and anxiety disorder expressed more severe levels of conduct problems (Wright, 2001). Furthermore, comorbidity has been shown to be especially high in children and adolescents but is less common in adults (Rohde et al., 1991). Research has suggested that conduct problems are predictive of emotional problems as children with conduct problems are at risk from developing emotional problems as they grow older (Boylan et al., 2010; Reef et al., 2010). In terms of explaining this pattern, a recent study found that there are shared genetic factors that predict both early conduct and later emotional problems, but also negative social experiences of conduct disordered children contribute to the development of later emotional problems (Wertz et al., 2015).

1.5. Prognosis

1.5.1. Conduct problems

The toddler and preschool years entail rapid development where child problems may just be temporary disturbances. Externalising problems are especially common during the early

years and then tend to decrease significantly during childhood (Bongers et al., 2003; Miner et al., 2008; Leve et al., 2005; Owens & Shaw, 2003). Nonetheless, there is evidence of continuity between early symptoms and problems later in development (Bufferd et al., 2012; Campbell & Ewing, 1990). In a community sample, children who met the criteria for ODD at age 3 were eight times more likely to also have ODD at age 6 (Bufferd et al., 2012). It has been shown that early symptoms of conduct problems are predictive of problems also at a later age; for example, adolescents with serious conduct problems often present problems at a very young age (Loeber & Dishion, 1983; Moffitt, 1990). In terms of predicting which children who show externalising behaviours in early childhood will go on to develop more serious problems later in development, there is indication that children who are faced with multiple individual, family, and social risks are the most likely to continue experiencing disordered behaviour (Campbell et al., 2000).

Children's experiences of conduct problems are not only distressing to children in their own right, but there is significant overlap between these child problems and other important aspects of children's development. Childhood externalising problems have been shown to be associated with reduced child functioning in terms of cognitive and educational outcomes, and social skill and peer relationships (Dodge, 1983; Maguin & Loeber, 1996; McGee et al., 1988). Moreover, these child problems do not just have concurrent impact on children's lives, but they are predictive also of later problems, such as adult mental health disorders, alcohol and drug abuse, unemployment, criminality, domestic violence, and child-abuse (Champion et al., 1995; Farrington, 1991; Fergusson et al., 2005; Rutter, 1996; Offord & Bennett, 1994; Simonoff et al., 2004).

1.5.2. Emotional problems

As noted above, internalising problems in very young children are relatively understudied. In comparison to studies on conduct problems, there has been a lack of longitudinal studies investigating continuity and prognosis of emotional problems with onset in very early childhood (Gardner & Shaw, 2008). Existing studies have tended to find that internalising problems increase gradually from early childhood and onwards (Fanti & Henrick; 2010; Gilliom & Shaw, 2004; Leve et al, 2005), and from early adolescence girls especially increase in levels of internalising symptoms (Bongers, et al., 2003; Leve et al., 2005).

Studies have indicated continuity of these early childhood problems. One prospective study of a sample of children aged 3 to 6 showed that children with major depressive disorder MDD at baseline were 11 times more likely to be depressed at 2 years follow-up (Luby et al., 2009a). A more recent study found that children who met criteria for an anxiety disorder at age 3 were four times more likely to also have this diagnosis at age 6 (Bufferd et al., 2012). Internalising problems have been shown to be associated with other aspects of children's lives such as learning problems and peer problems (Rapport et al., 2001; Reijntjes et al., 2010). Long-term outcomes of childhood internalising have also been reported, although these studies are scarce in comparison to externalising problems. Geller et al. (2001) found childhood depression predictive of a higher likelihood of adult major depressive disorder, bipolar disorder, substance use disorder, and suicidality. Anxiety disorder in childhood has been shown to predict anxiety later in adolescent (Bittner et al., 2007), and anxiety in adolescence has been shown to predict adult anxiety disorder; major depression; dependence on nicotine, alcohol, and drug; suicidal behaviour; and educational underachievement (Woodward & Fergusson, 2001).

1.6. Risk factors

Risk factors across the child's developmental ecology associated with conduct and emotional problems are: 1) family risks (parenting, parent mental health, family disruption, SES, education), 2) social risks (neighbourhood deprivation, peer influences) and 3) individual risks (child innate characteristics/genetics/temper, gender). These will be outlined in the following.

1.6.1. Parenting

In terms of environmental factors influencing child conduct and emotional problems, family environment and parenting have been highlighted as being especially influential. A large body of research has been dedicated to studying the link between parenting practices and these child problems. The kinds of parenting variables examined in studies have been informed by established theory, namely attachment theory (Bowlby, 1969, 1988; Ainsworth et al., 1978), social learning theory (Patterson, 1982), and theories that combine both of these (Baumrind, 1966; Maccoby & Martin, 1983). These theoretical frameworks will be presented in detail in Chapter 2 of this thesis.

1.6.1.1. Meta-analyses of associations between parenting and child conduct and emotional problems

Meta-analyses of studies that have examined the association between parenting practices and child conduct and emotional problems are useful in providing summaries of results across this body of research. The meta-analysis by Rothbaum & Weisz (1994) included studies that examined the association between parental caregiving and child externalising behaviour. The overall effect size across 47 included studies was r=.24. Specific parenting practices

associated with lower child externalising were: approval (r=.11), guidance (r=.23), motivational strategies (r=.22), synchrony (r=.25), and restrictiveness (r=.06, ns), whereas parental coercion was associated with higher levels of child externalising problems (r=.21). In the meta-analysis by Hoeve et al. (2009) on the relationship between parenting and offspring delinquency, effect sizes ranged between r=.12 and r=.23 in a total of 161 studies. Aspects of parenting linked with less delinquency were: support (r= .19), behavioural control (r= .19), authoritative control (r= .12), and general control (r= .21), whilst higher levels of delinquency were related to psychological control (r= .23) and authoritarian control (r= .12). In term of emotional problems, childhood anxiety was examined in a meta-analysis of 47 studies (McLeod et al., 2007a) and this found an overall effect of association with parenting of r=.21. Specific parenting aspects associated with lower child anxiety were: warmth (r=.06) and autonomy granting (r=.42), and parenting related to higher child anxiety were: withdrawal (r=.22), aversiveness (r=.23), and over-involvement (r=.23). A similar meta-analysis that summarised studies of associations between parenting and child depression found an overall effect of r=.28 across 45 studies (McLeod et al., 2007b). Parental warmth was associated with lower child depression (r=.28), whereas higher child depression was associated with parental withdrawal (r=.20), aversiveness (r=.33), and over-involvement (r=.24). It is important to point out that the large majority of studies in these meta-analyses examined concurrent associations between parenting and child outcomes, whilst only few studies looked at these relationships longitudinally with assessment of parenting preceding assessment of child outcomes.

1.6.1.2. Enduring effects vs revisionist perspective

A relevant issue in relation to parenting and its association with child conduct and emotional problems is the question of how important children's experiences of parenting are in the

long-term. Some child developmentalists have proposed that early experiences are less important because they are overshadowed by later experiences that are more causal in term of impacting child adjustment and functioning (Bruer, 1999; Clarke & Clarke, 1981, 2000; Harris, 1998; Lewis, 1997). Others have suggested that early childhood is a critical period, where children are especially sensitive to experiences, such as parenting, with long lasting effects on children's outcomes (Fraley & Roberts, 2005; Sroufe, 1979; Sroufe et al., 1990). These two respective approaches have been referred to as the *revisionist* perspective and the *enduring effects* perspective (Fraley et al., 2013). A special case of enduring effects is the notion of 'sleeper effects', which is a term coined by Kagan & Moss (1962) and defined as 'stronger correlation between variables measured early and late in development than between similar variables measured contemporaneously or more contiguously in time' (p.278). In relation to parenting, a sleeper effect would mean that effects of early parental behaviours grow stronger over time. A number of studies have shown support for enduring effects of parenting (Haltigan et al, 2013; Fraley et al., 2013; Raby et al., 2015; Vandell et al., 2010). The study by Haltigan et al. (2013) found predictive effects of observed maternal sensitivity at the first 3 years of life on adolescent psychopathology at age 15, measured as the total score on the CBCL (externalising and internalising problems combined), and this effect held whilst controlling for parental sensitivity at later time points including at age 15.

1.6.1.3. Shared parental risk factors for child conduct and emotional problems

The high degree of comorbidity of conduct and emotional problems, seen especially in childhood (Angold et al., 1999), may be explained in part by shared environmental factors such as parenting (Bubier et al., 2009; Hudson & Rapee, 2005). A systematic review by McKee et al. (2008) examined whether some parenting behaviours had association specifically with child externalising or whether associations were similar with internalising

problems. It was found that lower levels of parental warmth, higher levels of parent hostility, and lower levels of parent behavioural control were related to higher levels of both externalising and internalising symptoms in children, and there was no evidence of associations with parenting being different for these two types of child problems. Evidence of shared environmental risks for child conduct and emotional problems is further demonstrated in randomised controlled trials of parenting interventions designed for targeting child disruptive behaviours, which have demonstrated to also reduce child internalising problems (Sanders et al., 2012; Shaw et al., 2009; Webster-Stratton & Herman, 2008). Although intervention effects for internalising tend to be slightly smaller in these studies, and more generally the evidence for internalising outcomes is limited as few behavioural trials report these child problems (Furlong et al., 2012). However, the link between conduct and emotional problems has been found in a parenting intervention trial that showed that change in externalising behaviour was mediated more by change in internalising behaviour than by parenting practices (DeGarmo et al., 2004). Research has also indicated that similar aspects of parenting are associated with both conduct and emotional problems. Depressed children have parents who are less warm and communicative, and more critical, intrusive, and abusive (Hipwell et al., 2008; McLeod et al., 2007; Widom et al., 2007). These are largely the same parenting practices that are associated with conduct problems (Farrington, 2005; Loeber & Stouthamer-Loeber, 1986; Patterson, 1982; Patterson et al., 1992).

1.6.1.4. Reciprocal effects

Although child developmental models highlight the role of parenting in influencing child functioning, it is acknowledged that early human development may be a transactional process where children exert influence on their parents, including parenting practices which

in turn affect child functioning (Bell, 1968; Belsky, 1984; Sameroff, 1975). These processes are also referred to as transactional, reciprocal or bidirectional effects. This transactional approach very much underpins Patterson's (1982) coercion theory, outlined in the following chapter, which is concerned with the development of children's externalising behaviours.

Empirical studies that have investigated reciprocal effects have tended to draw on the coercion model by studying mainly reciprocal effects between parenting and conduct problems or externalising behaviours. Burke et al. (2008) examined reciprocal relationships between parenting (supervision, communication, involvement, timid discipline) and child behaviours (ODD, CD, and ADHD) in a sample of clinic referred disruptive disordered boys aged 7 to 12 followed through to age 17. It was found that only timid discipline predicted child conduct problems, but conduct problems predicted timid discipline, poorer communication, decreased involvement and poorer supervision. This study therefore suggests more child than parenting effects. The study by Pardini et al. (2008) examined bidirectional effects between parenting (poor parent-child communication, physical punishment, low positive reinforcement, timid parenting, and low parental involvement) and child conduct problems (CBCL ODD and CD) in an accelerated design with a large sample of boys assessed from age 6 to 16, and found good evidence of bidirectional effects across this developmental period with equally strong parenting as child effects. Also the genetically informed study by Larsson et al. (2008) that followed a large sample of pairs of twins (boys and girls) from the age of 4 to 7, reported effects from parental negativity to child externalising that were comparable to effects from child behaviour to parenting. Other studies have found little evidence of parenting or child effects over and above the stability of parenting and child variables. For example Shaffer et al. (2013), who examined bidirectional relationships between parenting (negative parenting, inconsistent discipline, poor parental monitoring, and corporal punishment) and child behaviour (ODD and CD), in a treatment

intervention with a small sample (N=139) of mostly boys, aged 6 to 11. Other studies have reported parent only effects, such as Lansford et al., (2011) who examined parent physical discipline and child externalising in a sample of low income boys followed from age 10-15. However, reported in the same paper were analyses of the same parenting and child variables using a community sample of boys and girls followed from age 6 to 9, and these results showed both parenting and child effects.

There are also studies that have shown only child effects. In a sample of high risk boys followed from 4th to 8th grade, Fite et al. (2006) found that parenting behaviours (positive parenting, involvement, monitoring, and inconsistent discipline) did not predict child externalising problems, but these child problems predicted parental monitoring and inconsistent discipline. Similarly, in the study by Verhoeven et al., (2010) with a sample of toddler boys followed from age 17 to 35 months, only child externalising predicted parenting practices (support, lack of structure, psychological control, and physical punishment). However, it is worth noting that both of these studies tested concurrent and not longitudinal reciprocal effects, whereas all other studies outlined above examined longitudinal bidirectional relationships. This suggests that - 'in the moment'- children may influence their parents more than the other way around. There are also longitudinal studies suggesting that parent-child effects happen concurrently rather than over time. For example Yates et al. (2010) investigated bidirectionality in a sample of children assessed at age 24, 42 and 72 months. They found no longitudinal effects of parenting quality (support and assistance) on child externalising, once parenting contextual strains (stressful life events, relationship tension, and quality of social support) was controlled for, and there was only borderline evidence of child effects on parenting quality, however, concurrently the associations between parenting and child behaviour were large and substantial.

Overall, in relation to research on reciprocal effects between child externalising and parenting, there seems to be a great deal of inconsistency with regards to whether the influence is greatest from parent to child, or from child to parent, or if there are effects in either directions over and above the continuity in parenting behaviours and child behaviours. It is noteworthy that these studies vary hugely in term of their samples (gender, age, risk status), how parenting and child behaviours are measured, whether parenting behaviours are positive or negative, and whether concurrent or longitudinal reciprocal relationships are studied, and length of time between measurement. It seems that the field would benefit from a systematic review and meta-analysis of reciprocal effects, with sensitivity analyses that examine some of these potential moderating factors.

Although the idea of parent-child reciprocity has mainly been applied to children's conduct problems, some have used the framework to conceptualise also the development and maintenance of child emotional problems (Biglan et al., 1990; Coyne, 1976). However, empirically the evidence is somewhat scarce as little research in this area has been carried out, although a few relevant studies have been completed. In a longitudinal study with a community sample of girls with 6 waves of annual data from child age 7 to 12, Hipwell et al. (2008) found moderate predictive effects of warm and harsh parenting on conduct and depressive symptoms, but effects of child symptoms on these parenting behaviours, although significant, were small in magnitude. Serbin et al. (2015) reported a similar pattern in a small sample of low-income boys and girls (N=138) assessed at age 7.5, 10.5 and 13.5, which found more and larger effects between positive parenting (support and structure) and child internalising problems, than between child internalising and parenting, although this study demonstrated no relationship in either direction between physical punishment and child internalising. The study by Barbot et al. (2014) examined bidirectionality between child internalising and parenting (stress, control, involvement, and rejection) in a sample of high

risk mothers in a two wave study over 5 years with children aged 8-12 at baseline. It was found that parental rejection predicted child internalising over time, whilst child internalising was predictive of parental stress. Therefore, in terms of bidirectionality of child internalising problems and parenting, research indicates that child internalising symptoms are predictive of aspects of parenting, although the effects of parenting on child problems are larger in magnitude. However, it is important to highlight that the literature in the field is somewhat scarce and more studies that examine reciprocal effects of child internalising problems are needed. In the current study, bidirectional relationships with parenting are examined for both child externalising and internalising problems.

1.6.1.5. Other social influences mediated by parenting

A range of socioeconomic and demographic indicators, and parent mental health factors, have been shown to be associated with children's conduct and emotional problems. These include parent education and employment, household income, family type, overcrowding, neighbourhood, and ethnicity (Bradley & Corwyn; 2002; Brooks-Gunn & Duncan, 1997; McLoyd, 1998); and parent mental health (Goodman et al., 2011). A large study on the prevalence of child mental health disorders in Great Britain showed that many factors predicted children's conduct and emotional disorders (Green et al., 2005). Social factors that predicted child conduct disorders were: single parent family, family unemployment, low parental educational qualifications, low household income, and neighbourhood disadvantage. For child emotional disorders predictive factors were: low parental education, family unemployment, and single parent family.

It has been shown that many of these social and family factors are mediated through family environment and parenting (Bornstein et al., 2012; Bradley et al., 2001; Evans, 2004; McLoyd, 1998). For example, Sampson and Laub (1994) found that household crowding,

family disruption, and economic deprivation had no direct effect on child delinquency, but was mediated through parenting practices (erratic parenting, supervision, parental rejection, insecure attachment). Larzelere and Patterson (1990) showed that family socioeconomic status had no direct relation to child delinquency when parent management skills were controlled for. The study by Dodge et al. (1994) found that part of the effect of family SES on child conduct problems was mediated by children's in-home socialisation experiences. Parenting has also been found to mediate effects of family deprivation on child emotional problems. For example, McLeod & Shanahan (1993) found that the effect of poverty on both externalising and internalising problems was mediated by harsh and unresponsive parenting.

The association between parental mental health and child outcomes also seems to work partly though parenting. Research indicates that anxious, depressed, and antisocial parents have compromised parenting practices, as they are more harsh, critical, and inconsistent, and less positive towards their children, promote less autonomy, and provide a less cohesive and expressive family environment (Harold et al., 2011; Hirshfeld et al., 1997; Lovejoy et al., 2000; Thornberry et al., 2003; Turner et al., 2003; Whaley et al., 1999). Furthermore, socio-economic status has been demonstrated to affect child behavioural and emotional problems through a double mediation pathway via parental mental health, which in turn impacts parenting practices (Dodge et al., 1994; Linver et al., 2002; Rijlaarsdam et al., 2013). However, as demonstrated in a recent review (Shaw & Shelleby, 2014), there is evidence that parental mental distress, especially caregiver depression, has a direct effect on the development of young children's behavioural problems that is not mediated by parenting practices.

It is not just family risks that have been found to be mediated by parenting, but also factors from other risk domains have been reported to influence children indirectly through caregiving practices. For example, neighbourhood risks may be mediated through parenting

as research has shown that parents living in disadvantaged neighbourhoods use harsher disciplinary techniques and are less warm towards their children (Earls et al., 1994); Klebanov et al., 1994). The mediating role of family and parenting variables was demonstrated in an early study by Rutter and colleagues (1975) that found that children's elevated levels of conduct disorder in inner London, compared to a matched group on the Isle of Wight, were explained by family factors. Although direct neighbourhood effects on young children's emotional and behavioural outcomes have been reported in studies whilst controlling for family level factors (see review by Leventhal & Brooks-Gunn, 2000), these control variables tend to be largely structural, e.g. income, education, ethnicity, family structure, family size, maternal age. Therefore, parenting practices per se are not controlled for, and it is conceivable that parenting mediates effects of neighbourhood as well as effects of family structural characteristics (Conger et al., 1994; Dodge et al., 1994). Especially for young children, who have limited direct contact with the neighbourhood, it is thought that neighbourhood effects are most strongly mediated by parenting characteristics and behaviours, whereas for older children and adolescents, neighbourhood characteristics may exert influence through other mechanisms, such as availability of institutional resources (e.g. schools), and norms and collective efficacy (e.g. peer association) (Leventhal & Brooks-Gunn, 2000). One study that included an observed measure of parenting found that neighbourhood disadvantage had an indirect effect on adolescent boys' conduct problems via deviant peer association but also via quality of parenting (monitoring, warmth, communication, hostility, inductive reasoning, and harsh discipline) (Simons et al., 1996). This study is therefore indicative that parenting factors may mediate neighbourhood effects on the functioning of not just younger children but also older children. Much of the research on neighbourhood effects originates in the field of criminology and focuses on conduct problems and delinquency, whereas fewer studies have examined parenting as a mediator of

neighbourhood effects on emotional problems. However, one example is the study by Deng et al. (2006), which found that effects of neighbourhood deprivation on child internalising behaviour were mediated by family processes involving family cohesion and parent-child conflict.

1.6.2. Genetic risks

It is important to acknowledge that there are large and significant heritable influences on child behavioural and emotional outcomes. Parents with depressive, anxious or antisocial symptoms are more likely to have children with conduct or emotional problems (Goodman & Tully, 2008; Van Goozen et al., 2007; Harold et al., 2011), and this intergenerational transmission may be largely genetically influenced (Jaffee & Prince, 2007; Ferguson, 2010; Rowe & Rodgers, 1997). Behavioural geneticists have argued that the association between parenting behaviours and child outcomes is not a causal relationship but one underpinned by genetics through gene-environment correlation (rGE) (Scarr & McCartney, 1983; Plomin et al., 1977). This correlation arises because genetics influence the rearing environment of children, either passively or evocatively (Jaffee & Price, 2007). Passive rGE suggests that the association between parent and child traits and characteristics is genetically confounded, meaning that the parental genes that influence parent characteristics and caregiving practices are passed on to the child and also influence child characteristics and behaviours. In essence, passive rGE proposes that the relationship between parenting and child functioning is not causal. Evocative rGE proposes that genetically influenced child characteristics impact how parents interact and respond to their children. So for example, a child who innately has a more difficult temperament is more likely to be responded to with harsh and coercive parenting, and with less warmth. Evocative rGE essentially suggests that parenting is influenced by the child's genetically influenced behaviour rather than the other way around.

1.6.3. Nature and nurture

Although it is important to acknowledge a significant contribution from genetics when accounting for children's behavioural functioning, it is still important to consider the contribution of environmental factors. This conundrum of nature versus nurture has been tested empirically in studies using designs that enable a partitioning of genetic and environmental influences, involving research designs with children of twins (COT), adoption, and in vitro fertilisation (IVF) (D'Onofrio et al., 2003; Leve et al. 2007; Thapar et al., 2007). As summarised in reviews and meta-analyses, this body of genetically informative research has consistently demonstrated that the development of conduct and emotional problems is not a question of nature *versus* nurture but a case of nature *and* nurture (Burt, 2009; Ferguson, 2010; Natsuaki et al., 2014; Rhee & Waldman, 2002). In Moffitt's (2005) review of studies that controlled for both passive and evocative gene-environment interactions, it was demonstrated that aspects of parenting remained significant risk factors for child antisocial behaviour.

In terms of the size of heritable influences, a consistent finding across genetically informed studies that have examined a range of human behaviours, is that heritability is smallest in childhood and then increases through adolescence and into adulthood (Bergen et al., 2007; Franic et al., 2010; Lau & Eley, 2008). Bergen et al. (2007) have summarised the literature in a meta-analysis of studies examining the heritability of various behavioural measures, including externalising and internalising, across childhood into adulthood. This showed that heritability in middle childhood accounted for around 30% of externalising behaviour, 20% of depression, and 10% anxiety. In young adulthood heritability had increased to around 40% for externalising, 40% for depression, and 70% for anxiety. Therefore, although heritability plays an important role in explaining child conduct and

emotional problems, childhood is the period when heritability is lowest and environmental aspects such as parenting remain an important factor.

In addition, there is mounting evidence originating from the field of behavioural genetics that children are affected differently by similar rearing experiences because of their genetics, referred to as gene-environment interactions (G x E) (Plomin et al., 1977; Rutter, 2006). This kind of genetically informed research has demonstrated that children's outcomes are influenced by interactions between their innate dispositions and the family environment in which they grow and develop. The genes that have been focused on in these studies are those related to serotonin transportation, dopamine reception, and monoamine oxidase A (MAOA), and individuals are genotyped according to whether they have a high or low risk versions of these genes (Pluess & Belsky, 2010). There is evidence of gene-environment interactions both in relation to child externalising behaviour (Caspi et al., 2002; Moffitt, 2005) and child internalising behaviour (Caspi et al., 2003; Cutuli et al., 2013; Kaufman et al., 2006; Nugent et al., 2011). Furthermore, as proposed by Belsky in his differential-susceptibility thesis (1997, 2005), children who are more genetically vulnerable to adverse environments are likely to also benefit more from optimal rearing conditions. This has been supported empirically in studies in relation to both conduct and emotional problems (Bakermans-Kranenburg & Van Ijzendoorn, 2011; Kim-Cohen et al., 2006; Pluess & Belsky, 2010; Van Ijzendoorn et al., 2012). In a meta-analysis by Van Ijzendoorn et al. (2012) of studies on the serotonin transporter genotype 5HTTLPR, similar gene-environment interactions were found for positive and negative environmental influences in terms of size of effect on child developmental problems, these included conduct and emotional problems but also other outcomes such as alcohol use and adolescent risky behaviours. As highlighted by Pluess & Belsky (2010), the existence of gene-environment interactions may underestimate the effect accounted for by the shared environment in genetically informed

studies, and thereby underestimating the effect of environmental influences on child functioning for children who are especially sensitive to their environment.

1.6.4. Prevention and intervention

Dealing with the many undesirable adult outcomes that are predicted by childhood conduct and emotional problems is of significant cost to society especially in terms of health services, social services, policing, criminal justice, and prison services. Therefore, there is a strong rationale for addressing child conduct and emotional problems not just in terms of the benefits to individual lives, but also in terms of the gains to wider society from a cost saving perspective (Scott et al., 2001, McDaid & Park, 2011). Another good reason to take child problems seriously and prevent these from carrying on into individuals' adult lives, is that those who experience continued mental health problems, and related problems such as substance abuse, criminality, and social marginalisation, tend to have compromised parenting practices as outlined previously. Investing in early prevention and intervention may therefore reduce the intergenerational transmission of conduct and emotional problems and thereby benefit future generations.

In terms of prevention and intervention, the identification of factors that protect children from experiencing these problems is important. As noted above, environmental influences have been shown to be especially strong in early childhood and the influence of parenting is a key risk/protective factor, with genetic factors exerting less influence in childhood but increasing with age. Furthermore, parenting is undoubtedly a more malleable factor, as we know far less about which genes influence antisocial behaviour, and in any case it is highly likely to be many genes of small effect, meaning that interventions targeting genetic factors will be much harder to design and implement.

The last two decades have witnessed an upsurge in prevention and intervention programmes designed to address child problems through parenting (for an overview see Scott, 2008). Parenting programmes have been widely researched and there is a growing evidence base for the effectiveness of these programmes, especially for child conduct problems, both in universal and in high risk populations. The existing level of evidence includes systematic reviews of randomised controlled trials (Dretzke et al., 2009; Furlong et al., 2012) as well as reviews of systematic reviews (Stewart-Brown & Schrader-McMillan, 2011). In addition to testing the main effects of interventions on parenting and child outcomes, there has in recent years been an increased focus on examining mediators of effects, and this has contributed to our understanding of how effects are achieved or what makes programmes 'work'. Mediation analyses have demonstrated that intervention induced reductions in child problems are mediated by reductions in critical, harsh and ineffective parenting (Beauchaine et al., 2005) and by enhanced positive parenting such as effective discipline, monitoring, positive behaviour support, and parent-child relationship (Dishion et al., 2008; Forgatch & DeGarmo, 1999; Eddy & Chamberlain, 2000; Gardner et al., 2006; Gardner et al., 2007; Gardner et al., 2010; Huey et al., 2000; Tein et al., 2004; Zhou et al., 2008). These positive and protective aspects of parenting identified as mediators of change in child functioning represent dimensions of parenting associated with both social learning and attachment theory. The focus of this doctoral thesis is on parenting practices related to these two theoretical traditions in terms of their association with child conduct and emotional problems. The following chapter will outline attachment and social learning theories of parenting, and discuss their similarities and differences, and how they may be interconnected in influencing child outcomes.

CHAPTER 2: Attachment and social learning theories of parenting

Attachment theory and social learning theory offer two very different frameworks for explaining children's behaviour and functioning. However, as Richters and Waters (1991) remind us, attachment theory and social learning theory have a shared ancestry as both originate in Freudian psychodynamic theory, which features aspects of both attachment and imitation. The emergence of these theories occurred as part of a rising disillusion with the psychoanalytic approach, which faced difficulties of empirically operationalizing many of its main concepts that were conceptualised at a subconscious and highly abstract level. This gave rise to attachment theory and social learning theory, both of which offered psychological processes that were easier to measure and test empirically. These new theoretical offshoots came to represent two dominant but distinctly different conceptual frameworks for understanding human development.

Attachment theory and social learning theory differ in terms of their relevance for the stages of a child's psychosocial development proposed in the Erikson model (Erikson, 1950). Attachment theory is strongly associated with the first stage of development (infancy until around the age of 2 to 3), which focuses on the basic needs of the infant and parents responding to these in a sensitive manner. Despite this early years focus, attachment theory highlights its applicability beyond infancy and the continuing need for a 'secure base' provided by parents. Social learning theory becomes relevant during Erikson's second stage of development from age 2 to 5. At this stage the child's focus is on exploring the world and it becomes more self-determined, wilful and autonomous, which is responded to by parents increasing their efforts to manage child behaviours by setting clear limits, reinforcement and modelling. Social learning theorists also emphasise these aspects of parenting in later stages

of child development. Around child age 2 to 3, attachment and social learning theory therefore overlap in terms of their relevance for child development within the Erikson model of child developmental stages.

The following sections outline key features of attachment theory and social learning theory in terms of how parenting is thought to contribute to the development of child behavioural problems. This is followed by a discussion of how these theoretical perspectives converge and diverge, and how one perspective can account for the other and vice versa. Theoretical work is outlined that suggests how processes of attachment and social learning can be viewed as complementary and working together in influencing the development of children's problem behaviours. Examples of some of the few empirical studies that have compared parenting constructs from these two traditions are also outlined. It is proposed that there is a need for further empirical work that examines attachment based parenting and parenting belonging to the social learning tradition in terms of their respective roles in child development and behavioural functioning.

2.1. Attachment theory

Attachment theory originates with John Bowlby (1958, 1960a, 1960b, 1969) who formulated the basic principles of this theory. Bowlby drew significantly on psychoanalytic theory, although he also adopted the perspective of object relations theory by proposing that humans develop in relation to their external social environment, rather than being shaped by their internal libidal and aggressive drives as proposed in classical Freudian psychoanalytic theory (Bretherton, 1992; Holmes, 2002). Bowlby in particular emphasised the importance of the family environment, especially the bond the between mother and infant, and viewed the first three years of a human's life as especially sensitive in terms of the development of attachment (Bowlby, 1958). He proposed that there are four phases of attachment during this

period: 1) pre-attachment, 2) attachment in the making, 3) clear-cut attachment, and 4) goal-corrected partnership. These phases will be detailed further in the following along with other central aspects of attachment theory.

2.1.1. A child's drive for attachment

Bowlby drew heavily on ethology – the scientific study of animal behaviour – in explaining the child's need for forming a bond with its caregiver. He suggested that the infant has an instinct or drive to form a tie with the mother as this will ensure its protection and survival. In the first phase of attachment 'pre-attachment', from birth to around 6-8 weeks, the infant will instinctually engage in attachment behaviours or 'instinctual responses', which Bowlby termed behaviours such as crying, sucking, clinging, following, and smiling (Bowlby, 1958). The proposed function of these behaviours is to attract attention and stimulate a response from a caregiver. Bowlby suggested that the drive for maternal attachment is not just based on meeting physiological needs, such as food and warmth, but it also stems from a need for psychological attachment. Whilst some of the attachment behaviours (e.g. crying and sucking) are strategies for instantaneous satisfaction of physical needs that are essential for survival, others such as smiling can be seen as an infant's attempt to bond with the mother psychologically. This latter strategy will ensure that the mother is psychologically and emotionally invested on a long-term basis in meeting the child's needs for food, comfort and protection. Therefore, the instinct for bonding makes evolutionary sense. Moreover, Bowlby maintained that the child's psychological connection with the mother is not a secondary drive, i.e. learnt behaviour as classical Freudian theory and behaviourists would argue, but instead he suggested that attachment is a primary drive on par with other instinctual behaviours that function to satisfy immediate physical needs. Bowlby pointed out that the infant at first is indiscriminate as to whom it directs its instinctual responses. In the second

phase of attachment 'attachment in making' (6-8 weeks to 6-8 months), the infant develops a sense that the caregiver will respond when signalled. At this stage the infant will come to recognise and respond more positively to the primary caregiver, although he will not protest when separated from the parent and fully fledged attachment has not yet taken root.

The notion that the child's need for emotional security and comfort is beyond the provision of physical needs is supported by the experimental work of Harlow (1958) on infant rhesus monkeys. Infants reared in a nursery setting, where they were maternally deprived but otherwise cared for physically, displayed behavioural maladjustment, compared to monkeys reared with their mothers. In further experiments on rhesus infants with wire and cloth surrogate mothers, Harlow demonstrated that infants tended to prefer to cling to the cloth surrogate despite receiving food from the surrogate.

2.1.2. Separation anxiety, grief and anger

Only later, in the third phase of attachment 'clear cut attachment' (6-8 months up to 2 years), the child will come to clearly favour the parent, referred to as 'monotrophy' (Bowlby, 1958, p.370). The parent becomes the main attachment figure and maintenance of proximity to the attachment figure is a primary goal of the infant, whereas strangers tend to be viewed as a threat. It is at this stage that the child will experience separation anxiety, and will grieve and mourn the loss of the mother. Bowlby proposed that, because of this instinctual need for attachment, when infants' attachment behaviours are not responded to or satisfied by the attachment figure, this triggers anxiety and distress (Bowlby, 1960a). Separation anxiety, as Bowlby described it, is experienced in a situation of threat of maternal separation, for example when the mother is out of sight. Attachment theory proposes that separation anxiety is experienced by all children; however the degree of anxiety depends upon the strength of the parent-child bond. Bowlby discriminated dichotomously between *secure* and *anxious*

children. He proposed that children who have achieved a strong mutual psychological tie with their parent show less anxiety because they feel certain that their caregiver will return. On the other hand, anxious children with weak parental bonds will feel uncertain of their parent returning and will therefore be highly anxious. Bowlby noted that anxious children display their separation anxiety in two different ways; whilst some are *adherent* to displaying amplified attachment behaviours mixed with anger towards the mother, others are *avoidant* and show very little reaction. Ainsworth later elaborated on this categorisation in her development of the attachment classification system which is outlined further below.

For Bowlby, the importance of attachment is also demonstrated by children grieving and mourning in relation to long-term separation from or permanent loss of their attachment figure (1960b). Drawing on observational studies, Bowlby articulated that "persistent longing of the young child for his lost love object is often suffused with intense generalized hostility" (1960b, p. 23). This describes how first grief tends to prevails, but later this is substituted by aggression and hostility towards the lost attachment figure and others, and also towards the child self. Bowlby therefore emphasised the loss of an attachment figure as an important risk factor for a child developing destructive and antisocial behaviours. The development of unemotional traits he attributed to maternal loss as the child will have learnt that forming a close emotional bond can lead to anguish if severed, and the child will therefore be reluctant to develop new attachment relationships. Bowlby originally emphasised the child's literal loss or separation from the attachment figure, however he also acknowledged the application of these principles in relation to inadequate caregiving practices by a present attachment figure. Later, the work of Michael Rutter has been especially influential in developing this aspect of attachment theory. Rutter's research has demonstrated that the loss of a parent through bereavement has less behavioural and

emotional consequence for children than the absence of attachment security with a present caregiver who engages in dysfunctional caregiving practices (Rutter, 1972, 1979).

2.1.3. Attachment patterns and parental antecedents

In her well-known Baltimore study, Mary Ainsworth contributed significantly to attachment theory by further developing the attachment classification scheme that types children as (A) *insecure-avoidant, (B) secure,* or *(C) insecure-ambivalent* (Ainsworth et al., 1978). Later, Main and Solomon (1990) added *(D) insecure-disorganised* attachment to this classification scheme. These types of attachment styles are identified in the *Strange Situation Procedure* (SSP), which assesses the child's response to separation and reunion from the caregiver in an unfamiliar and potentially threatening environment. This procedure was designed to directly test some of the central tenets of attachment theory such as 'monotrophy', 'separation anxiety' and 'maternal loss', which peak in the third phase of attachment development (Bowlby, 1969).

In Ainsworth's study, mother and infant dyads were observed intensively during the first 3 months of life, and child attachment was assessed at the age of 1 year. It demonstrated that the behavioural strategy or 'attachment style' employed by children during the SSP was related to the type of caregiving received from the mother in early infancy (Ainsworth et al., 1978). Children classified as *securely attached* had been subject to consistent, sensitive and affectionate care, and they had therefore come to view their mothers as dependable and responsive in a time of need. These children showed protest when the mother left, but they were relatively confident when she was out of sight and could be comforted by the stranger, although they clearly preferred the mother. When reunited with their mother, secure children sought proximity and comfort and greeted the mother with positive affect. These children were calmer and generally displayed less visible and frequent attachment behaviours towards

the mother as they had established a secure bond with her. Secure children also appeared relatively independent and explored their environment more.

Children with insecure attachment styles on the other hand behaved quite differently in the separation/reunion procedure and this corresponded with their suboptimal care experiences. *Insecure-ambivalent* children tended to have mothers who were inconsistent, unavailable and unreliable in their response, and who at times neglected their child and were inclined to be reactive rather than proactive in interaction with their child. Insecure-ambivalent children had therefore come to learn that their mother would not always be available when needed. These children tended to show great distress and anxiety at separation, and they were not be easily comforted by the stranger. In reunion with their mother they displayed ambivalence by seeking proximity and comfort from her, whilst simultaneously showing anger and hostility towards their mother for having been abandoned. Ambivalent children were observed to engage less in independent exploration as they were preoccupied with maintaining their mother's attention, which they manifested in behaviours such as following or clinging.

Children of the *insecure-avoidant* type generally had mothers who consistently showed very little responsiveness to their child, and who rejected or dismissed the child when seeking comfort. These children had come to learn that their mother was not willing to provide comfort and security, but on the contrary she would often be a source of rejection and disapproval. Avoidant children showed very little visible reaction to their mother leaving, although they sometimes went looking for her during the SSP, and in their behaviour they discriminated less between the stranger and their mother. When the mother returned, these children tended to not approach her for comfort but they showed indifference and avoidance. Avoidant children had essentially given up on establishing a secure attachment with their mother. To protect themselves from rejection they instead avoided her,

although they noted her presence in case she was needed for physical protection, but these children did not expect or actively seek a psychological bond with their mother.

Children who Main and Solomon (1990) classified as *insecure-disorganised* had characteristically been subjected to frightening or aggressive behaviours by their caregiver, such as severe neglect or abuse. This includes extremely harsh and negative parenting, and intrusive and controlling parenting. Disorganised children may also have experienced their caregiver expressing emotions of fear and anxiety, and because children draw on their caregivers' emotional signals to guide their own perceptions, these children come to feel unsafe and anxious. These children have learnt that their parent offers them no protection but instead is a potentially a source of harm. In the SSP procedure disorganised children act incoherently, for example by engaging in unusual behaviours such as rocking or freezing, or by showing fear or confusion in the presence of the parent. These children face the dilemma that the parent is needed for protection but is simultaneously feared. They are traumatised and overwhelmed by their experiences and lack a rational or organised strategy for responding to their attachment figure. The disorganised category has however been criticised as being a category for placing children who are difficult to classify as either secure, avoidant or ambivalent, resulting in this category including a broad range of children (Svanberg, 2009). For example, children who show avoidant attachment behaviour in the first separation episode may show ambivalent behaviours in the second. In Ainsworth's seminal study she had noted that it was difficult to fit all children into the established A, B or C categories (Ainsworth et al., 1978), and although she approved of the new 'disorganised' category introduced by Main and Solomon (1990) she recommended it being left open to subcategories (Ainsworth, 1990). Alternative systems for classifying patterns of behaviours during the SSP procedure have also been developed (Crittenden et al., 2007). In addition, there are attachment measures that use a scale rather than categories, such as the Security

Scale (Kerns et al., 2000), and given that most human behaviour fall on a continuum rather than into discrete categories, scales may be more appropriate for examining how attachment relates to aspects of child functioning.

A further aspect of parenting that has been investigated in relation to child attachment patterns is parents' own childhood experiences and representations of attachment (Main & Goldwyn, 1984). The Adult Attachment Interview (AAI, George et al., 1984) was developed for the assessment of attachment representation by asking individuals about their childhood experience of their relationship with their parent(s), and how these early experiences have influenced their lives. The AAI classifies adults into four categories - autonomous, dismissing, preoccupied, and unresolved - which correspond to the attachment patterns for children - secure, avoidant, ambivalent, and disorganised (Main & Goldwyn, 1984; Main & Hesse, 1990). Studies examining the association between parents' attachment representations and their children's attachment styles have shown evidence of an intergenerational transmission of attachment. A meta-analysis of 18 studies showed an overall association of r=.47 between adult autonomy and security of their offspring (Van Ijzendoorn, 1995). This synthesis also showed that parent attachment representations correlate with parental sensitivity (r=.34), which is indicative that attachment parenting may be a partial mediator of the relationship between adult representations and child security.

2.1.4. Attachment beyond infancy

As noted above, the assessment of attachment in Ainsworth's study was timed at age 1, which is during Bowlby's third phase of attachment development when children's attachment anxieties peak (1969). After this phase, attachment enters what he proposes to be the fourth and final stage of the development of attachment, the 'goal-corrected partnership' or reciprocal relationship (24 months to 3 years). Children's separation and stranger

anxieties attenuate, and their sense of security is less concerned with the physical proximity of the attachment figure as their focus shifts to the availability of the parent in times of need. With the advancement of their locomotor and cognitive skills, toddlers explore their environment more and the parent is needed as a 'secure base' to which they can return, especially in times of distress. During this phase, the child increases its understanding of their caregiver's own goals and needs, which may be different to that of the child, and the child learns the necessity to integrate these with its own goals and needs. This phase sees the start of the development of a reciprocal relationship and social skills.

Although much of Bowlby's and Ainsworth's focus is on the first three years of life, attachment theory acknowledges that secure attachment relationships remain important throughout life. Bowlby proposed that 'whilst especially evident during early childhood, attachment behaviour is held to characterise human beings from cradle to grave' (Bowlby, 1979, p. 129). Later attachment researchers have focused on attachment later in childhood (Kerns, 2008), in adolescence (Allen, 2008), and in adulthood (Feeney, 2008; Magai, 2008; Mikulincer & Shaver, 2008). However, the first attachment relationship with our parent(s) is regarded as especially significant, as it can come to shape later relationships by forming our internal working models as described below.

2.1.5. Internal working models

Bowlby proposed that caregiving behaviour and infant attachment play a crucial role in children's development and in their future lives through the mechanism of *internal working models* (Bowlby, 1969). Internal working models define the extent to which the child perceives others as dependable and trustworthy, as well as the extent to which he regards himself as worthy of love and attention, and as competent in interacting with the surrounding world. A secure child will, through a trusting relationship with its caregiver, have developed

healthy internal working models. This child will view others as trustworthy and will view himself as lovable and deserving of attention. From the child's experience of being able to elicit a positive maternal response, he will regard himself as competent, and will have a sense of influence and agency in interactions with others and the external world. In other words, a secure child will be a confident child. On the contrary, as a result of insufficient care and attention, an insecure child will lack trust in others, will regard itself as unworthy of love, and will have little feeling of having influence and impact on others or the surrounding world. This child will be lacking confidence and self-esteem.

These working models of perception and expectations are thought to influence competency and behaviour, much like a self-fulfilling prophecy. Bowlby proposed that working models are maintained through a feedback system. A secure child will approach the world with optimism and a sense of competence, and will therefore experience positive responses and outcomes that will reinforce their healthy working models. The opposite is true for an insecurely attached child, who will approach situations with a lack of trust in self and others. An insecure child will therefore tend to receive negative feedback, which then reinforces existing negative internal working models. The salience of internal working models is that these are not confined to childhood, but they become the default for interacting with the world at large, and guide behaviour in other close relationships throughout life. Bowlby proposed that faulty internal working models are the cause of behavioural and emotional problems in both children and adults, such as aggression and depression, in addition to a whole range of other psychiatric disorders. Because of the feedback mechanism that tends to reinforce the status quo, working models are relatively stable and not easily changed. Nevertheless, because working models are constantly updated through individuals' experiences, this creates opportunity for revision and reconfiguration of

models. Bowlby proposed that changes are more easily made in childhood when models are more malleable, than in adulthood where they have become more solidified.

Later attachment theorists and researchers have further refined the mechanisms through which attachment might impact behaviour and have emphasised the mediating role of emotional regulation. Sroufe suggests that children's strategies for self-management of stressful emotions and arousal is developed within the parent-child attachment relationship (Sroufe, 1979, 1997). He proposes that children who are securely attached are better able to regulate their emotional responses. Avoidant children on the other hand are over-controlled, ambivalent children are under-controlled, and disorganised children have unpredictable emotional responses and are least able to regulate their emotions.

2.1.6. Attachment and child outcomes

In terms of research that links attachment theory to child outcomes, two influential longitudinal studies that have followed children from birth have been particularly influential in exploring the relationship between child attachment and a range of child developmental outcomes. The Minnesota Parent-Child Project commenced in 1975 and recruited 267 first time mothers who are still followed up. The NICHD Study of Early Child Care and Youth Development started in 1991 with a sample of 1364 infants and followed these through to age 15. In addition, a number of shorter follow-up studies and cross sectional studies have informed the field. This body of research has demonstrated that attachment is related to children's conduct and emotional problems as well as to other areas of functioning. In a recent meta-analysis of 69 studies involving 5,947 children, Fearon et al. (2010) found an overall effect size of d=0.31 between insecure attachment and child externalising. The meta-analytic review by Hoeve et al. (2012) on the link between attachment and delinquency, reported an overall effect of r=.18 across 74 studies with a total 55,537 participants. With

regards to emotional difficulties or internalising problems, a meta-analysis by Colonnesi et al. (2011) reported an overall association of r=.30 between insecure attachment and anxiety across 46 studies and 8,907 children. However, for clinical depression the evidence of a link to attachment is weak, as Groh et al. (2012) reported a small and insignificant effect (d=.12, n.s.) across only 3 studies (N=295). Other child outcomes that have been shown to be related to secure attachment include social skills and peer relations (Schneider et al., 2001), and although attachment has not been found to be associated to IQ per se, attachment is related to other preconditions for learning such as behaviour, motivation for learning, and emotional adjustment (Kerns, 2008; Moss & St-Laurent, 2001).

Other studies have examined the relationship between parenting associated with secure attachment (e.g. synchrony and warmth) and with insecure attachment (e.g. rejection and over-control), and how their prediction of child conduct and emotional outcomes. This body of research has been summarised in meta-analyses showing associations of attachment related parenting aspects to child conduct problems (Hoeve et al., 2009; Rothbaum & Weisz, 1994) and to child emotional problems (McLeod et al., 2007a, 2007b). These were outlined previously in Chapter 1in the section of risk factors.

To summarise what has been presented above regarding attachment theory. This theory essentially offers an approach that emphasises internal and emotional processes as underpinning child behavioural outcomes and functioning at a broad level. This focus on internal and emotional processes in influencing child behaviour may be an explanatory factor for the high comorbidity between child externalising and internalising problems as outlined in the preceding chapter. In terms of the implications that attachment theory has for informing prevention and intervention for improving children's behavioural and emotional functioning, it supports early intervention focusing on inducing attachment parenting with the aim of improving children's attachment security and associated internal working models

and/or emotional regulation. As outlined above, the kind of practices parents should adopt to optimise their children's outcomes are sensitive, caring, and warm parenting, which lead to the establishment of a secure and trusting parent-child relationship. The current study examines the predictive effect of parental 'warmth' on the development of child conduct and emotional problems.

2.2. Social learning theory

2.2.1. Classical social learning theory

Social learning theory can be regarded as a neo-behavioural approach as it builds on the concepts of classical conditioning and operant conditioning. Some of the initial formulations of this theory originate with Julian Rotter (Rotter, 1954) but most influential has been the work of Albert Bandura (Bandura, 1962; Bandura, 1969; Bandura & Walters, 1963; Bandura & McClelland, 1977). Social learning theory suggests that, in addition to learning through direct experience of behavioural conditioning and reinforcement, behaviour is also learnt through observation and imitation of others. In fact, Bandura proposed that this route to learning is more common than primary experiences - "Of the many cues that influence behaviour, at any point in time, none is more common than actions of others" (Bandura, 1986, p.206). It is suggested that the child learns through direct experience and by watching and imitating the behaviour of parents and others. Parents encourage behaviour by praising the child and offering incentives, as well as setting limits and appropriate sanctions on negative behaviours. Bandura proposed that, in addition to modelling through observations of live behaviour, also 'verbal modelling', such as instruction, is a route to learning once adequate language development has taken place (Bandura, 1969). Therefore, an important aspect of parenting within the social learning approach includes the communication of clear

and age appropriate instructions, which function as a behavioural guide for the child. A third kind of modelling identified by Bandura is 'symbolic modelling', for example through films, book and cartoons, where models can be a fictional character or a real person.

Bandura (1969) proposed that there are certain prerequisites for social learning to take place, these are: *attention, retention, reproduction* and *motivation*. First, it is imperative that the child pays attention, as it is unlikely that behaviour will be reproduced if it has not been observed with adequate attention, or in case of verbal modelling, if instructions have not been heard or understood. Second, retention of the modelled event or behaviour is necessary for its replication, which is especially relevant if there is a time delay between modelling and imitation. Third, reproduction of behaviour is necessary in social learning as repetition and frequent practice of the behaviour help strengthen learning. Fourth, there has to be a motivation or incentive for the behaviour to be performed and to be repeated, so this involves reinforcement and punishment based on the principles of operant conditioning.

2.2.2. Social learning and child conduct problems

2.2.2.1. Coercion theory

In terms of social learning theory and the development of children's antisocial and externalising behaviours, Patterson's coercion theory has been especially influential (Patterson, 1982; Patterson et al., 1992; Patterson et al. 1989). Coercion theory proposes that "families of antisocial children are characterized by harsh and inconsistent discipline, little positive parental involvement with the child, and poor monitoring and supervision of the child's activities" (Patterson et al., 1989, p. 264). Through repeated daily interactions with the parent, the child learns that the parent will cease efforts to apply controls if the child itself uses negative and forceful behaviours. This way the child learns that coercion can be

used to control parents and other family members, and that coercion is a behavioural strategy for the child to get its way. As the child adopts coercive behaviours the parental response is likely to be an escalation of harsh parenting. This further intensifies the child's negative behaviours as it attempts to escape parental controls and demands, and this escalation of negative child behaviours is likely to lead to the parent eventually backing down. Coercive cycles and the development of child conduct problems therefore involve a large degree of negative reinforcement. Thus, a cycle of coercive interaction is established, which is likely to intensify over time, and this way the antisocial child receives basic coercion training within the family setting. However, the child's display of antisocial behaviour is not limited to interactions with parents, and in time this behaviour is exported to settings outside the home in the child's interaction with peers and other adults. The child's problematic behaviours are likely to lead to rejection by pro-social peers, and opportunities are thereby lost for positive socialisation influences, but instead the child is likely to gain acceptance by antisocial peers who provide further training ground for antisocial behaviour. The coercion model has been researched through studies using especially developed methods for micro-analytic observations of parent-child interactions (Forehand & McMahon, 1981; Patterson, 1982; Patterson et al., 1992). Studies by Patterson and others working within the coercion approach have found that the above mentioned aspects of parenting are related to child conduct problems (Dishion & McMahon, 1998; Loeber & Dishion, 1983; Patterson et al., 1992).

2.2.2.2. Positive parenting

In coercion theory there is a clear emphasis on negative parenting behaviours, although a deficit in positive parent-child interactions is also flagged as problematic - "The training for deviant behaviors is paralleled by the lack of training for many prosocial skills… It seems that some families produce children characterized by not one, but two problems. They have

antisocial symptoms and they are socially unskilled." (Patterson et al., 1989, p.265). Although, in their study of a sample of boys, Patterson and colleagues (1992) found that it was predominately ineffective discipline and lack of monitoring that predicted children's negative and antisocial behaviour; whereas positive parenting, such as parent involvement, parent support and dyadic problem solving, were weak predictors of both antisocial and pro-social behaviour. Dishion and Patterson (2006) propose that a reason for this may be that coercive cycles block opportunities for pro-social behaviours and their reinforcement within parent-child interactions, and they suggest that interventions that reduce parental coercion would inadvertently increase positive parenting.

Others working within the social learning paradigm have highlighted the need to focus on positive parenting behaviours as an important primary agent for child behavioural outcomes (Dowdney et al., 1984; Gardner, 1987, 1994). Gardner (1987) suggests that there is good reason to focus on the micro-social processes of harmony and positive parent-child interactions, because even in families characterised by coercion very little time is in fact spent in conflict between parents and children. Gardner (1987) found that children with conduct problems spent much less time in positive activities, such as play and conversation with their mothers, than children without conduct problems. Their mothers are also less frequent in initiating activities, and contribute less to keeping activities going, and they show less responsiveness to their child's inputs (Gardner, 1994). In another study it was found that time spent in joint play predicted conduct problems over and above negative mother-child interactions (Gardner et al., 2003). Furthermore, in the context of a social learning intervention, it has been demonstrated that positive parenting, rather than negative parenting, mediates intervention effects on children's behavioural problems (Gardner et al., 2010). These studies provide evidence that, as well as receiving training in coercion, antisocial children are lacking training in positive interactions and positive reinforcement, and this

impacts directly on their behavioural outcomes. The importance of positive social learning parenting has become influential in many well-known evidence-based intervention approaches underpinned by social learning (e.g. Sanders, 1999, 2004; Webster-Stratton, 2001).

In summary, social learning in relation to child behavioural outcomes involves a process where the child observes and imitates behaviours, and through repeated practice of behaviours it learns that that there are benefits to be gained from certain behaviours, whereas other behaviours are best avoided. Social learning theory is therefore built on the foundation that behaviour is driven mainly by external inspirations and motivations. There is no explicit emphasis on the emotional aspect of the parent-child relationship or internalisation of behaviour. Rather, the approach seems to suggest that there is a regular need for parental input in the shape of modelling and motivational rewards in order to keep child behaviour in check. Within the social learning perspective, optimal parenting involves setting limits and sanctions on negative child behaviours, and this must be done consistently by following through and not backing down when met with protest from the child. Social learning parenting also includes facilitation and encouragement of positive child behaviour by providing clear instructions, and praising the child for compliance and engagement in positive and pro-social behaviours. The current study examines the extent to which parenting related to social learning, more specifically ‘effective management’, is predictive of child behavioural and emotional functioning.

2.3. Attachment and social learning theories of parenting: points of convergence and divergence

2.3.1. A shared appreciation of parenting

As proposed by Scott (2003), "Social learning theory approaches have shown that children are parented in such a way that the child's prosocial overtures are ignored (Gardner, 1989), and antisocial strategies inadvertently rewarded (Patterson, 1982). Such parenting is probably also insensitive and dismissive, and likely to give rise to attachment problems." (p.309). In other words, attachment theory and social learning theory are largely in agreement on what constitutes optimal and inadequate parenting practices.

In Ainsworth's study of parental antecedents of attachment patterns, it was demonstrated that securely attached children were those who had experienced sensitive, affectionate and consistent care (Ainsworth et al., 1978). Furthermore, a meta-analysis of 66 studies found that in addition to parental sensitivity, which had the strongest association with attachment, several other parenting constructs were associated with child attachment security: contiguity of response, physical contact, cooperation, synchrony, mutuality, emotional support, positive attitude, and stimulation (De Wolff & Van Ijzendoorn, 1997). Many of these attachment constructs would fit well within the catalogue of positive parenting behaviours captured in observed parent-child interactions within the social learning approach (Dowdney et al., 1984; Gardner, 1987).

Communication may be another common denominator of attachment and social learning parenting. Clear communication and instruction are aspects of parenting most commonly associated with social learning theory (Bandura, 1969; Dowdney et al., 1984); however, these may also have a potential function in relation to a secure attachment relationship. Kobak and Madsen (2008) suggest that as infants become toddlers and the need

for parents to introduce discipline arises, communication becomes important for the attachment relationship as "parental discipline can be perceived by a child either as a signal that the child needs to alter his or her behaviour, or as a rejection or threat of abandonment" (p. 34). Parents who are good communicators are essentially less likely to have children who interpret parental requests and controls as a withdrawal of love, and their children are more likely to be securely attached. Communication might be especially important in the fourth and final phase of attachment development with the forming of what Bowlby refers to as the 'goal-corrected partnership' (Bowlby, 1969). At this stage, around the age of 3, the child develops an ability to understand that their attachment figure has their own goals and plans, which may conflict with that of the child, and the secure child learns to negotiate and integrate his plans with those of his attachment figure into a shared set of plans. The child's cognitive and linguistic development is usually highlighted as a prerequisite for establishing a goal-corrected partnership (Marvin & Britner, 2008), but it makes intuitive sense that communication on the part of the attachment figure would also be significant for this emerging partnership.

This consensus between the social learning and the attachment perspective on parent-child interactions has also been noted by coercion theorists Patterson and Fisher (2002), and by Dishion and Patterson (2006) who suggest that "both theories agree on the fundamental importance of parental responsiveness as being a necessary condition for socialization" (p.517). Although, it seems to be that these theories differ somewhat in terms of what parents are responsive to. The attachment perspective highlights the importance of parental sensitive responsiveness to *child needs,* as this will facilitate the development of secure attachment and healthy internal working models. Within the social learning model the necessity for parental responsiveness is in relation to *child behaviours,* in order to reinforce good behaviours and limit undesirable child behaviours.

Also in relation to what is identified as negative parenting practices, there seems to be a significant overlap between these theoretical models. In attachment theory the parenting behaviours that have been demonstrated to lead to insecure attachment, such as rejecting, inconsistent, unavailable, reactive, aggressive, and controlling parenting (Ainsworth, 1978; Main & Solomon, 1990), match well with parenting behaviours identified by Patterson as leading to coercive cycles of parent-child interactions (Patterson, 1982; Patterson et al., 1992; Patterson et al., 1989).

2.3.2. Points of divergence

As well as similarities, it is relevant to also highlight differences and points of divergence between attachment theory and social learning theory in terms of what constitutes positive and negative parenting.

In terms of positive parenting, differences emerge largely with respect to the behavioural management side of parenting. The social learning approach insists that in order for a child to repeat and adopt pro-social behaviours, attention, praise and rewards should only be dispensed when the child engages in these behaviours. Parental attempts to appease a misbehaving child with rewards would undermine the social learning process as the child will learn that these behaviours are rewarded (Patterson, 1982; Patterson et al., 1992). Therefore, non-contingent parental warmth, such as positive attention in the context of a child's display of negative behaviours, would not be conducive to pro-social child behaviour, but is likely to instead encourage the development of conduct problems. Attachment theory, on the other hand, does not stipulate conditions under which parents should show their child warmth and sensitivity, and neither does it highlight the need for setting limits and sanctions on child behaviours. Such disciplinary practices are however emphasised in the social

learning perspective as imperative for child management, as disciplinary practices will discourage children from repeating undesirable behaviours.

There are also points of divergence between these theoretical frameworks in terms of negative parenting practices. Although both theories highlight inconsistent and harsh parenting as undesirable practices there are important differences in how these concepts are perceived and thought to operate in affecting child functioning. In coercion theory, inconsistent parenting refers to the parent backing down when the child displays antisocial behaviour. In attachment theory, inconsistency is related to the inconsistent availability of the parent in responding to the child's needs, which is associated with the insecure-ambivalent attachment pattern. In relation to harsh parenting, attachment theory suggests that consistently harsh and rejecting parenting is a precursor for insecure-avoidant attachment. Within the social learning perspective, harsh parenting is presented as problematic mainly in the context of inconsistency, i.e. where coercive parent-child interactions end with the parent terminating efforts to control the child. The emotional aspect of the child's experience of harsh parenting is largely ignored in coercion theory and the focus is on the conditioning aspect of how parenting comes to influence child functioning. In attachment theory, on the other hand, the emotional dimension of harsh parenting is paramount in explaining child dysfunction.

2.4. Attachment and social learning as competing perspectives

In addition to examining attachment perspectives and social learning in terms of their points of convergence and divergence, these theoretical models can be considered as rivalling perspectives that offer competing mechanisms for how parenting practices translate into child behavioural outcomes. In the following sections, social learning will be interpreted

from an attachment perspective, and vice versa, there will be an outline of how the formation of attachment can be viewed through a social learning lens.

2.4.1. Social learning from an attachment perspective

2.4.1.1. Child coercion a manifestation of attachment behaviours

The idea of coercive cycles, which is central to the social learning perspective on the development of child conduct problems, could be explained entirely from an attachment theory angle. As proposed by Greenberg et al. (1993), there are different ways that attachment might be related to child behavioural problems. First, the child's display of coercive behaviour could be interpreted as a result of dysfunctional internal working models, formed as a result of inadequate parenting practices as outlined above, and these lead the child to have low expectations of self and others, which influence child behaviours. Second, child externalising behaviours may be perceived as attachment behaviours where the child acts out in order to seek attention and proximity to a parent who responds (albeit harshly and reactively) only to the child's antisocial behaviours. Third, there may be a motivational aspect of secure parent-child attachment whereby the child is more likely to comply with parent directives if securely attached. This latter mechanism draws also on social learning principles, and in a later section that considers social learning and attachment as complementary processes, this will be explored further.

Of the three mechanisms proposed by Greenberg et al. (1993), the second model suggesting that children's display of negative behaviours functions as an attachment strategy seems to best account for the phenomena of coercive cycles. Child antisocial behaviours are essentially a continuation of what Bowlby (1958) referred to as 'instinctual responses' that infants engage in in order to elicit parental attention and proximity, and which have the

ultimate function of ensuring the infant's protection and survival. Secure infants who have experienced prompt and sensitive responses to their attachment cues, will later in their development engage less in attachment behaviours such as crying, and they also explore their environment more (Ainsworth et al., 1978). As proposed by Main (1990), securely attached children have the privilege of feeling psychologically secure. Insecurely attached children, on the other hand, lack the feeling of psychological security, and therefore they resort to alternative strategies to ensure that their caregiver will at least protect them from physical dangers if the need arises. The strategy used by insecure-avoidant children is to keep their rejecting, hostile, and controlling parent within reach for protection, but at sufficient physical and psychological distance to minimise harm. Insecure-ambivalent children, who have inconsistent and reactive parents, use the tactic of bringing attention to themselves through displays of aggressive and coercive behaviours, as this is an attempt to ensure parental attention and proximity. Both the ambivalent and avoidant strategies can be regarded as adaptive, whereas children of the insecure-disorganised classification lack a coherent behavioural tactic (Main & Solomon, 1990). Disorganised children are essentially overwhelmed by their experiences of abusive or neglecting parenting and they are unclear as to how to respond and therefore appear 'disorganised' in their attachment behaviours (e.g. stilling, rocking, and generally displaying unusual and odd behaviours). Of the three insecure attachment patterns the strategy used by ambivalent children fits especially well with Patterson's notion of coercive cycles. This resemblance is present in the work by Crittenden (1992) who uses the term 'coercive' children rather than 'ambivalent' in her work on the characteristics of attachment at preschool age.

2.4.1.2. Monitoring as a function of attachment

Another aspect of parenting that is emphasised in Patterson's coercion theory is the importance of supervision and monitoring of children, which has been demonstrated to be

associated with reduced antisocial behaviour (Loeber & Dishion, 1983; Patterson, 1982; Patterson & Stouthamer-Loeber, 1984; Snyder & Patterson, 1987; Sampson & Laub, 1994). However, the link between monitoring and child behaviour could equally be explained within an attachment framework. Empirical studies largely define and measure monitoring as parental knowledge about children's whereabouts, activities and associations (Crouter & Head, 2002; Dishion & McMahon, 1998). It is conceivable that a secure parent-child relationship plays an important role for parents' knowledge, because secure children would be expected to be more likely to volunteer information with regards to their plans and activities. As suggested by Stattin & Kerr (2000) "parental monitoring is a relationship property" (p.1083).

Empirical research has supported this hypothesised role of attachment in relation to parental monitoring. In a sample of 176 third and sixth graders, Kerns et al. (2001) showed that the strength of attachment security was associated with closer monitoring, and secure children played a more cooperative role in monitoring. Also Stattin & Kerr (2000) found that parents' monitoring knowledge came mainly from child disclosure rather than parent solicitation, and that child disclosure was the source of monitoring knowledge that was most closely associated with delinquency. Furthermore, intervention research has indicated that parental monitoring may not be a causal mediator of change of children's behavioural outcomes. This was demonstrated in an RCT of a substance use prevention programme that targeted parental controls on adolescent access to alcohol and association with substance using peers (Cohen & Rice, 1995). No effect of this intervention strategy was found. However, when examining protective factors for substance use, this study found that these were all relational aspects between parents and adolescents: a) parent knowledge of child's whereabouts, b) parent-child rapport (time spent together and communication), and c) respect (positive relations, praise, and fair treatment). Some studies have found parental

monitoring to mediate intervention effects on adolescent drug use (e.g. Dishion et al., 2003), however, as highlighted above, the measurement of monitoring may in some cases reflect properties of the parent-child relationship rather than parents' active monitoring efforts. Across intervention studies more generally, it seems to be the case that there is very little evidence for monitoring as mediator of effects in parenting interventions. This was shown in a systematic review by Forehand et al. (2014) of randomised controlled prevention and intervention studies that examined parenting as a mediator of change in youth externalising behaviour (k=25). Only 4 studies tested monitoring and supervision as a mediator, with a total of 10 tests, and only one test (10%) showed that monitoring was a significant mediator. This review showed that other aspects of parenting had been studies much extensively and a greater proportion of these tests were significant: positive parenting (45%), negative parenting (26%), and discipline (55%). Therefore, there is little support for parents' active monitoring having causal effects on child conduct problems, whereas other aspects of parenting seem to better predict these outcomes. It is likely that parent and child relational aspects explain the association between monitoring and child outcomes. This has direct implication for intervention efforts to prevent children's antisocial behaviours. It suggests that parenting interventions should abandon their focus on parental monitoring and instead concentrate on building a positive and securely attached parent-child relationship.

2.4.1.3. The paradox of consistent harsh parenting

As outlined above, one of the drivers of coercive cycles is harsh and reactive parenting in combination with a lack of consistent discipline, such as the parent failing to follow through with demands and lacking persistence when met with oppositional child behaviours. In coercion theory, which draws heavily on operant conditioning principles, it is this negative

reinforcement aspect of parenting behaviour which is highlighted as problematic rather than harsh and coercive parenting per se.

A large body of research from the field of coercion theory has demonstrated that harsh and rejecting parenting is a significant risk factor for children's development (Hoeve et al., 2009; Loeber & Dishion, 1983; Patterson, 1982; Patterson et al., 1992; Rothbaum & Weisz, 1994). However, most studies have not measured parental negative reinforcement contingencies in parent-child interactions with a focus on the end point of coercive cycles, in terms of who 'wins' the conflict. Although there are some studies that have looked at this, and where negative reinforcement has been operationalised as an episode of parent-child conflict where the child provides the last coercive behaviour whilst the parent capitulates (Gardner, 1989; Snyder et al., 2016). In one of the first studies to examine this, Gardner (1989) demonstrated that the proportion of episodes of conflict that ended with the mother giving in to the child, thereby providing negative reinforcement, were much higher for children with conduct problems (43.0%) compared to children without conduct problems (5.5%). In a high-risk sample of boys and girls, Snyder (2016) examined growth in child physical aggression from kindergarten to first grade and found that parent negative reinforcement was associated with rate of child aversive behaviour during parent-child interaction, which then predicted the change over time in child physical aggression. As Snyder (2016) point outs, even when studies measure negative reinforcement there is the problem that interactions captured at the micro-level often are part of a larger macro-level pattern of harsh parenting and discipline. This makes it difficult to separate the exact contribution of negative reinforcement from the contribution of harsh and coercive parenting more generally.

Another problem with studies on negative reinforcement seems to be that there is an assumption that outcomes of parent-child conflict are mainly parent led. It is plausible that a

reason why parents of children without conduct problems tend to be more consistent and follow through with their demands without giving in to the child, is that these children are more likely to comply at an earlier stage and when the conflict is less intense. On the other hand, children with conduct problems would be expected to engage in conflicts for longer and to display aversive and coercive behaviour at a greater level of intensity. This suggestion is supported by findings from coercion research, for example, Paterson (1976) found that oppositional children, compared to normal children, show longer and more intense coercive interactions. Also in Gardner's (1989) study, the length of time spent in angry parent-child conflict was much higher for deviant children (6.5 minutes per hour) compared to normal children (0.4 minutes per hour). Therefore already existing child conduct problems are likely to play a significant role in how parent-child conflicts end. The negative reinforcement hypothesis, which underpins coercion theory, would be more convincing if the children who started out with no conduct problems, and where parents frequently capitulated, later went on to develop conduct problems at a higher rate than children of consistent parents. Being able to also separate negative reinforcements from a general pattern of negative and harsh parenting would be imperative. Therefore, there is a lack of studies that convincingly demonstrate that inconsistent parenting, or negative reinforcement, is predictive of child behavioural problems.

Within the framework of coercion theory, it would be unexpected that harsh parenting on its own would lead to child behavioural problems. Parents who are consistently harsh and reactive, and who do not concede to the child's oppositional behaviours, would within this behaviourist approach be expected to have children who have learnt that misbehaviour is not in their interest. However, this is not consistent with the many studies from both the tradition of coercion theory and from attachment research that have shown that harsh and rejecting parenting is a significant risk factor for child dysfunction, although these

studies have not examined *consistency* of harsh parenting. From an attachment perspective however, it seems unlikely that harsh but consistent parenting would lead to child compliancy and better adjustment. As outlined above, attachment theory emphasises the emotional impact of harsh parenting on the development of the child's internal working models, which then influence child behaviour and functioning. Coercion theory seems to ignore the significance of any emotional processes involved in the link between harsh parenting and child outcomes. Furthermore, social learning speaks only to conduct problems, whereas attachment theory can explain also the development of child emotional problems, which have been shown to be associated with harsh and rejecting parenting (McLeod et al., 2007a, 2007b).

Attachment theory may also explain why children of harsh parents continue to engage in problem behaviours when they know that this will be met with coercive parenting. If attachment related objectives, such as parental attention and proximity, are the ultimate goal for an insecurely attached child, and if there is a lack of a positive parental response to pro-social behaviours, the child's only chance of meeting this goal is by engaging in antisocial behaviours. A child's concern with attachment therefore seems to override social learning mechanisms. This also explains why some degree of ignoring a child's deviant behaviour can be a powerful parental strategy. For a child, being ignored and denied attention may be experienced as a more severe punishment than coercive parenting, as the latter inadvertently provides the child with attention and proximity to the parent and therefore fulfils the child's concern for physical security. Although the child's need for psychological security remains unfulfilled (Main, 1990).

2.4.1.4. Positive parenting induces attachment security

Whilst the above has discussed how negative aspects of social learning parenting can be interpreted from an attachment perspective, it should also be highlighted how *positive* social

learning parenting can be conceptualised within this framework. Parents who spend time positively engaging with their children in activities such as play and conversation, and who actively support, stimulate, praise and encourage their children (Dowdney et al., 1984; Gardner, 1987, 1994) may not primarily set in motion social learning processes. Instead, such parenting practices may lead to secure child attachment and the development of healthy internal working models, which attenuate the child's need to engage in problematic attachment behaviours to elicit attention (Greenberg et al., 1993). Support for this is found in a qualitative study of social learning based parent management training that found that parents reported changes in their child's behaviours that indicated secure attachment (Sutton, 2001). The salience of attachment processes in the effectiveness of social learning parenting is also dealt with by Scott and Dadds (2009) in their discussion of parenting training that does not work. They suggest that "successful use of the SLT [social learning theory] contingencies will only occur when the reward side of the ledger includes higher investments of emotion, touching, time together, and expressions of love and commitment" (p. 1444). In other words, effective rewards are those highly charged with attachment. Therefore it is possible that it is attachment aspects of positive social learning parenting that are most influential in the shaping child behavioural functioning.

2.4.2. Attachment from a social learning perspective

Having demonstrated how attachment may account for social learning processes, the reverse could also be proposed. The social learning framework may explain the formation of attachment relationships between caregivers and their children.

2.4.2.1. Attachment a result of operant conditioning

The presence of social influences in attachment theory is a relatively uncontroversial suggestion, considering that Bowlby adopted the principles of objects relations theory in his

formulation of attachment theory. Objects relations theory proposes that humans develop in relation to their external environment, rather than being subjects of internal libidal and aggressive drives. However, as outlined above, one innate instinct that Bowlby considered key to child development is the infant's drive to form a bond to the caregiver (Bowlby, 1958).

Although the social learning perspective does not dispute the existence of an attachment relationship between parents and their children, it would argue that attachment is a secondary drive, i.e. behaviour learnt through processes of operant conditioning (Dollard & Miller, 1950; Sears et al., 1957). Within this behaviourist perspective a child's primary drives are the need for food and warmth, and attachment is proposed to develop secondary to this as a result of the caregiver meeting these needs. As articulated by Sears et al. (1957), "The sight, sound, smell, and feel of her [the mother/caregiver] become associated with high gratification. He not only expects her to come when he is hungry, but learns to *need* her in the same sense that he needs the food she brings." (p. 66).

Gewirtz suggested that conditioning is not a unidirectional process from mother to infant, but the infant also reinforces the caregiver's nurturing behaviours (Gewirtz, 1961; Gewirtz & Boyd, 1977). A baby's behaviours such as smiling and cooing, and termination of negative and distressing behaviours such as crying, reward the mother for engaging in warm and sensitive caregiving, and this reinforces her behaviour. This bi-directional learning process proposed to be involved in the development of the parent-child relationship is summed up well by Hay & Vespo (1988) who suggested that "mothers and children must learn to relate to each other, and thus neither maternal caregiving nor infants' attachment behaviour is completely instinctual" (p.73).

2.4.2.2. Social learning 'disguised' in main attachment concepts

In their examination of the role of social learning in the formation of the attachment relationship, Hay & Vespo (1988) propose that processes of social learning are *disguised* within some of the main areas of attachment theory and research.

First, social learning can be seen in relation to how children come to develop secure or insecure attachments. The caregiver's interactive style teaches the child what response to expect from the caregiver, and these expectations guide the child's behavioural response and adaptation to the caregiver, as manifested in attachment experiments such as the strange situation procedure. Through repeated parental responsiveness and sensitivity, the child comes to learn and predict that the parent is trustworthy and available for comfort and support. This view of the parent as dependable and trustworthy will then become the prototype for engaging with others, and will shape later attachment relationships with peers, romantic partners, and own children. In addition, these parental responses will shape the child's perception of self as loveable, worthy of attention, and competent in eliciting a response from others. Hay and Vespo (1988) are essentially suggesting that social learning processes are involved in the development of internal working models.

Second, they propose that the parent's own representations of attachment, as assessed in the Adult Attachment Interview (AAI; Main et al., 1985), involve social learning. These representations are shaped by the rearing pattern adults experienced in childhood and this influences their own parenting behaviour.

Thirdly, Hay and Vespo (1988) suggest that elements of social learning may underpin the capacity for the parent-child attachment relationship to change, for example as a result of the caregiver's circumstance and the impact this has on parenting practices. Reviews of research in this area, including the meta-analysis by Fraley (2002), have shown that factors such as family instability, family discord, and abuse, are associated with

instability in attachment over time. In their narrative review, McConnell and Moss (2011) also highlight family functioning, especially marital discord, as being influential for change in attachment.

In addition to those proposed by Hay and Vespo (1988), there might also be additional areas of attachment that are underpinned by social learning processes. For example in relation to the concept of 'earned security', which refers to adults coming to terms with their insecure childhood experiences and forming secure inner working models (Main et al., 1985; Hesse, 2008). Research has demonstrated that adults with earned security are likely to have had an alternative adult to whom they felt close during childhood (Saunders et al., 2011; Zaccagnino et al., 2012), and attachment representations have also been demonstrated to be reformed within romantic relationships (Crowell et al., 2002). Earned security may therefore be achieved through repeated interactions with other attachment figures, involving processes of social learning rather than reconfiguration of working models entirely at an internal and reflective level.

The operation of social learning in maintaining the attachment system can be seen in relation to the importance of consistency of warm and affectionate parenting throughout a child's life. Secure attachment in infancy is not an inoculation against negative child outcomes. The effects of discontinuity of parenting behaviours have been investigated in two well-known longitudinal studies that have followed children from birth and that have assessed infant attachment. Both the NICHD Study of Early Child Care and Youth Development (Belsky & Fearon, 2002) and the Minnesota Parent-Child Project (Erickson et al., 1985) have shown that children who in infancy were classified as insecure, but who later as toddlers received high quality parental care, went on to function better behaviourally at preschool age than children who started out with a secure attachment status but later were later subject to inadequate parenting. This observation that attachment is not a fixed

phenomenon is congruent with Bowlby's formulation of attachment theory, as it proposed that internal working models are updated based on individuals' lived experiences of their relations to others (Bowlby, 1988). It is conceivable that social learning processes, such as repeated behaviours and reinforcement, are at work in the updating and reconfiguration of internal working models, parallel to the suggestion above regarding earned security being learnt.

Another aspect of social learning to consider as a possible influence on the formation of attachment is Bandura's principle of modelling (Bandura, 1969; Bandura & Walters, 1963; Bandura & McClelland, 1977). It is likely that parental display of warmth, affection, and sensitivity, or the opposite, parental avoidance, rejection and regression, are behavioural models that children simply imitate. Modelling and imitation may contribute to the intergenerational transmission of attachment; a process that was first observed by Main et al. (1985), who found a correlation of r=.62 (<.001) between security of mothers' attachment representations and the security of their own offspring in infancy. In a later meta-analysis, a correlation of r=.47 was found across 18 studies examining intergenerational transmission (Van Ijzendoorn, 1995).

2.4.2.3. The success of attachment based interventions with a behavioural approach

Further support for the proposition that social learning processes operate in the formation of attachment may be found in research from the field of attachment focused parenting intervention. Egeland and colleagues (2000) categorised attachment interventions according to which risk or causal factor was targeted, and they identified four types of attachment interventions: 1) parent sensitivity (e.g. parenting skills), 2) parent attachment representations (e.g. psychotherapy), 3) social support, and 4) maternal mental health and wellbeing. In a comprehensive systematic review and meta-analysis of 51 randomised

controlled trials, Bakermans-Kranenburg et al. (2003) examined which type of intervention approach was most effective in enhancing parental sensitivity and child attachment. In terms of improving parental sensitivity, it was found that interventions that were skills based (k=20), focusing on teaching parent greater sensitivity, had a combined effect size of d=0.45; interventions that focused on supporting parents (k=3) showed an effect of d=0.27; and the single intervention that targeted parental attachment representations demonstrated no effect (d=0.00). In terms of child attachment outcomes, 23 RCT studies showed that interventions targeting parent sensitivity skills and behaviours had a moderate effect size of d=0.39, whilst representational and support oriented approaches had no significant effect on child attachment. Further, in a meta-analysis of 15 intervention studies that measured disorganised attachment as an outcome, Bakermans-Kranenburg et al. (2005) found that interventions that took a behavioural approach in addressing parent sensitivity were more effective in reducing attachment disorganisations (d=.23) than programmes that aimed to change parent attachment representations through therapeutic routes (d=-0.04).

These reviews suggest that it is parents' improvement in skills and behaviours, rather than a resolution of their attachment representations, that makes a real difference to child attachment. In other words, a 'doing' approach rather than a 'talking' approach seems to be the most effective in attachment based interventions. These findings can therefore be interpreted as a testament to the working of social learning processes in the establishment of children's attachment security.

2.5. Attachment and social learning as complementary processes

Instead of viewing social learning and attachment processes as incompatible, there may be a case for considering that both of these theoretical processes are related to child functioning and they may even work jointly. As O'Connor (2002) suggests, parents who are warm and

affectionate are also those who most effectively manage their children by setting firm limits, and therefore attachment and social learning theories should be regarded as companions. The idea that attachment and social learning are complementary processes is outlined in the following.

2.5.1. Developmental models integrating attachment and social learning

The idea of combining aspects of parenting from attachment theory and social learning theory can be observed already in the early and influential work of Baumrind's, in which she deals with the concept of parenting styles (Baumrind, 1966, 1967, 1971, 1978). Parenting style refers to the overarching or global parenting environment, as opposed to parenting behaviours and practices, which are more specific and micro-level behaviours (Darling & Steinberg, 1993). Baumrind's three category typology of parenting - *permissive, authoritarian and authoritative* - and the fourth category *neglectful* parenting added by Maccoby and Martin (1983), are configurations of high and low parental 'demandingness' and 'responsiveness'. Demandingness corresponds closely with social learning parenting aspects, and responsiveness is rooted in attachment parenting. The parenting style identified as leading to optimal child functioning is authoritative parenting, which is characterised by high parental demandingness as well as high responsiveness. In other words, authoritative parenting involves high competency in both social learning and attachment related parenting.

Others have more explicitly proposed and refined ways in which social learning and attachment may relate and interact in affecting child outcomes. Richters and Waters (1991) call for an integrative approach and argue that on their own neither social learning nor attachment can account well for prosocial and antisocial behaviour. They propose that "attachment contributes to socialization outcomes by rendering children more socializable" (p.9) and highlight the motivational aspect of attachment whereby parental praise and

approval has an amplified motivational effect on securely attached children. Secure children place a higher value on the approval and positive opinion of parents, whereas transgression and non-compliance is more costly as parental loss of trust and disappointment is a high price to pay for secure children. Insecure children on the other hand are unfamiliar with the value of positive parental opinion, and securing it is therefore less of a motivator for these children, whereas parental disapproval is felt as less of a punishment. In other words, parental approval is a larger carrot for securely attached children and its motivational effects are so profound that these children come to internalise parental standards of behaviour. Richters and Waters (1991) propose that attachment is a motional force not only for situational compliance but also for committing more generally and longitudinally to prosocial values and behaviours.

In both the paradigm of the authoritative parenting style (Baumrind, 1966), and the motivational model (Richter & Waters, 1991), it is implied that rather than posing the question of whether it is attachment or social learning processes that predominately influence child functioning, one should consider both of these theoretical mechanisms as being influential in child development. In combining these models, one would expect child functioning to be enhanced by parents who employ both high levels of attachment related practices and high levels of social learning parenting. Empirically this would mean that child functioning is predicted by an interaction between attachment related parenting and social learning based parenting. This hypothesis will be tested in the current study.

Another model that incorporates both attachment and social learning aspects is the risk model approach by Greenberg et al. (1993). This identifies four domains of risk factors as contributors to the development of child behavioural problems: 1) child characteristics (e.g. temperament, genetic vulnerability, and neurocognitive function), 2) adverse family ecology (e.g. family stress, resources, family functioning, and social support), 3) parental

management and socialisation processes, and 4) insecure attachment. This model suggests that insecure attachment on its own is unlikely to lead to significant child problems; however in the context of other risks, insecure attachment can result in severe behavioural problems. It is noteworthy that attachment and social learning aspects are placed in separate risk domains, despite both being concerned with parental practices. Greenberg and colleague's rationale for separating these parental risk domains is that these are associated with different developmental functions - attachment is about developing the child's *internal world* (self-esteem, trust in others) whereas parental management is oriented towards teaching the child cultural norms and values of the *external world*. Another reason for their separation is that attachment and parental management processes start at different time points, with attachment processes commencing in infancy, whilst management becomes prominent only in toddlerhood with the emerging need to set limits on the child's exploration and behaviour (Erikson, 1950). This risk model therefore implies that children's development is influenced by both attachment and social learning processes, but these take place at different developmental stages and serve different functions. The current study will examine if early attachment based parenting and later parenting related to social learning are both predictive of child conduct and emotional problems.

Although attachment and social learning practices may occupy different temporal developmental stages, there may be an important relationship between the early attachment system and later parental management processes that is influential for child behavioural functioning. This is put forward by Shaw and Bell (1993) in their 'bridging model', a developmental model that links attachment with social learning theory in conceptualising parental influences on the development of child antisocial behaviour. This model suggests that the attachment pattern established in infancy lays the foundation for later social learning processes. A parent-child dyad with a secure attachment pattern is less likely to later develop

coercive cycles of interaction. This is in contrast to insecure infants and their neglecting or rejecting parents who are at risk of establishing these negative patterns of interaction. The bridging model implies that a lack of early parenting that supports the development of secure attachment, such as sensitivity and warmth, leaves children especially vulnerable to negative and ineffective disciplinary practices (or lack of positive practices) later in development, and leads to the development of child problem behaviours. This model therefore suggests that there may be an interaction between early parenting related to attachment theory and later parenting that draws on social learning theory. One of the aims of the current study is to examine this hypothesis by testing interactions between early aspects of parenting associated with attachment and later parenting drawing on social learning theory.

2.5.2. Integration of attachment and social learning in parenting interventions

There has been an integration of attachment and social learning perspectives not only theoretically but also at the level of intervention. Parenting interventions have been developed based on a large body of research from both theoretical traditions, which has shown an association between parenting and child functioning. Interventions are typically underpinned by a main theory of change that guides the content and approach of the intervention (Fraser et al., 2009). Parenting interventions based on attachment theory tend to centre around inducing parental sensitivity, whereas social learning interventions focus on parental management and disciplinary techniques. However, in reality, many interventions take a less purist approach and integrate these theoretical approaches. For example, in the social learning based programme Incredible Years (Webster-Stratton, 2001), aspects such as warmth, affection and sensitive responding are prominent features. This programme operates on the principle that the parent-child relationship is a necessary foundation for social learning, and therefore has strong parallels with the integrational models outlined above.

Also the well-known Triple-P programme features relationship based content (Sanders et al., 2004). Similarly, some attachment based interventions draw of social learning parenting aspects, for example in the attachment focused intervention 'Video-feedback Intervention to Promote Positive Parenting and Sensitive Discipline' (VIPP-SD; van Zeijl et al., 2006), management and discipline strategies are incorporated. All of these programmes have been evidenced in RCT studies as being effective in reducing child behavioural problems, and this suggests that the combination of attachment and social learning parenting may be an effective intervention strategy for improving child outcomes. Further evidence of the usefulness of theoretical integration can be found in the review and meta-analysis by Rothbaum and Weisz (1994) that examined the association between parenting and child externalising behaviour. This showed that parenting patterns or styles, as measured by constructs involving multiple variables, are stronger predictors of child outcomes than single parenting behaviours. Especially strong associations between parenting and child externalising were found in studies that manipulated parenting experimentally. One interpretation of this finding could be that intervention studies manipulate multiple theoretical caregiving variables rather than just a single aspect of parenting.

2.6. Empirical comparison and integration of attachment and social learning parenting

Both attachment theory and social learning theory have inspired a large body of research that has examined parental influences on children's behavioural outcomes. Although, each theoretical framework has largely pursued its own research agenda, and parenting constructs from these two perspectives are rarely examined and compared in the same study. Even when attachment and social learning aspects of parenting feature together they often appear

in an aggregated or composite form, such as in research on parenting styles (Baumrind, 1966, 1967, 1971, 1978), or they are combined in multi-dimensional parenting constructs of positive parenting (e.g. Waller et al., 2014; Sitnick et al., 2015). A more comparative empirical approach to attachment related parenting and social learning parenting would be important for addressing questions relating to what kind of parenting practices are most influential for children's development and functioning.

2.6.1. Different operationalisation of attachment and social learning parenting constructs

A reason for a lack of comparison and integration between social learning and attachment related parenting constructs may be due to differences in their empirical operationalization, which is related to their respective underlying mechanisms and hypothesis of how parenting influences child functioning. As outlined above, the social learning perspective emphasises transactional parent-child interactions, and research within this tradition has therefore focused on measuring these processes. Although questionnaire based measures exist (e.g. *Alabama Parenting Questionnaire*, Shelton et al., 1996; *The Parenting Scale*, Arnold et al., 1993; see Locke & Prinz (2002) for a review) the gold standard has been observational methods (Aspland & Gardner, 2003; Gardner, 2000; McMahon & Metzler, 1998). This involves the coding and quantification of observed parent behaviours related to coercion theory, such as maternal directives and critical comments (Patterson, 1982); and observed positive parenting such as mutuality, positive affect, joint activity, play and conversation (Dowdney et al., 1984; Gardner, 1987, 1994). Examples of well-known coding systems are: Family Interaction Coding System (FICS; Patterson, 1982; Reid, 1978); Dyadic Parent-Child Interaction Scale (DPCIS, Robinson & Eyberg, 1981); Behaviour Coding Scheme (BCS, Forehand & McMahon, 1981; and Relationship Process Code (RPC, Dishion et al., 2002).

Other systems, such as that by Gardner (1987, 1994), have been developed to capture a wide range of harmonious and positive parent-child interactions.

These coding systems are usually applied to observations where parents and children are instructed to do specific tasks such as playing with a toy, preparing a meal, or clearing up. In addition to the coding of specific behaviours and their frequency, global measures have been developed as supplements to micro-social observations; for example, the Observer Impressions Inventory (OII; Weinrott et al., 1981), and a later adaptation of this, the Coder Impressions Inventory (COIMP; McMahon & Lengua, 1996; Dishion et al., 2004). Another widely used global observational measure is the Home Observation for the Measurement of the Environment (HOME; Bradley & Caldwell, 1979, Bradley et al., 2001), which includes aspects of parenting as well as other dimensions of child's home environment.

In attachment research on the other hand, there is less focus on dissecting parent-child interactions, with emphasis instead placed on the child's overall feeling of security (or internal working models). This is usually measured through observing children's responses in situations of separation and reunion from their attachment figure. Many studies of infants use Ainsworth's Strange Situation Procedure (SSP; Ainsworth et al., 1978) but methods have also been developed to assess child security in preschool children (e.g. Attachment Story Completion Task; Bretherton et al., 1990), in school aged children (e.g. Manchester Child Attachment Story Task; Green et al., 2000), and in older children and adolescents (e.g. Child Attachment Interview; Shmueli-Goetz et al., 2008;Target et al., 2003). For assessment of adults, the Adult Attachment Interview (Main et al., 1985) has been developed as mentioned above. Although studies have explored which parenting practices are related to child attachment security (Ainsworth et al., 1978; De Wolff & van Ijzendoorn, 1997) the main focus of attachment research in relation to behavioural outcomes has been on the

child's display of attachment. The attachment field is therefore lacking in established measures of *parenting* behaviours.

However, some advancement in the field has been made, such as the development of the Coding of Attachment Related Parenting (CARP; Matias et al., 2006a; Matias, 2006b; O'Connor et al., 2013). This is a global coding scheme designed for direct observation of parent-child interactions. This attachment related measure draws on methods traditionally used in social learning research (parent-child interactions), but behaviour is coded according to key aspects of attachment parenting (sensitivity, mutuality, and affect) rather than social learning parenting. Such operationalization of attachment theory at the level of parent-child interaction enables a better comparison between these two theoretical parenting dimensions. The current study also uses observational methods and global measures, both for parenting related to social learning theory and parenting drawing on attachment theory.

2.6.2. Studies comparing attachment and social learning aspects of parenting

Despite the empirical separation of attachment and social learning aspects of parenting and associated differences in their operationalization, some inroads have nevertheless been made in terms of examining questions relating to the relationship between parenting constructs from these two theoretical perspectives, and their association with child development.

O'Connor et al. (2013) explored the relationship between changes in attachment related and social learning related parenting within the context of an intervention. This was the Primary Age Learning Skills (PALS) study, an RCT of the Incredible Years programme plus a literacy programme (SPOKES), with children aged 4-6 years (N=174) from a deprived inner-city area. In this study, parenting behaviours were assessed through observations of parent-child interactions in three tasks (free play, structured task, and tidy-up task), which were coded using two coding schemes. The CARP (Matias et al. 2006a) was

used for measuring attachment related parenting, and this global measure included two positive attachment dimensions: 'sensitive responding' and 'mutuality'. Social learning parenting was measured using the Parent Behaviour Coding Scheme (PBCS; Aspland, 2001), which is a micro-social measure based on frequency counts of a range of positive 'child-centred' and negative 'child-directive' parenting behaviours. Further details of both of these parenting coding schemes are detailed in Appendix B, which outlines methodological details of existing studies that have examined social learning and attachment aspects of parenting in relation to child functioning. Results showed that programme induced changes in social learning parenting ('child-centred behaviours') correlated with changes in attachment related parenting behaviours ('sensitive responding'). However, this result might be expected because the Incredible Years programme involves both social learning and attachment components. Whilst the main focus of this programme is on social leaning based parental techniques for managing behaviour, such as praise, punishment, setting boundaries and limits, and ignoring, other techniques are attachment based and involve child-centred approaches, such as following the child's lead in play, and using mental state language to describe the child's mood, feeling and thoughts (Scott, 2008). Another reason for the correlation between the two parenting aspects might be that there is some overlap between their measures, this is in relation to the attachment concept 'sensitive responding' and the social learning dimension 'child-centred behaviour', as both feature the parent being child-minded and making encouraging and facilitating comments. In other words, this study does not provide a clear separation of these theoretical parenting constructs in how they are measured.

In further analysis of the PALS sample, using only the pre-treatment data, the relationship of the two parenting dimensions to peer nominations of being 'liked', 'disliked', and 'fighting' was explored (Matias et al., 2013). The same attachment parenting behaviours

('sensitive responding', 'mutuality') and social learning parenting ('child-centred', 'child-directive') were used as in the O'Connor et al. (2013) paper; with exception of 'criticism' that in these analyses was separated from the 'child-directive' construct and represented its own social learning parenting factor. Results of bivariate correlations showed that attachment parenting measures were associated with all peer nomination outcomes, but social learning aspects were associated with only the most antisocial behavioural measure 'fighting' ('positive attending', $r=-.21$, $p<.05$); and 'criticism', $r=.45$, $p<.001$). In this study further analyses were carried out that included all aspects on parenting and also controlled for gender and verbal IQ. Results showed that only 'criticism' was associated with fighting, but being liked or disliked were not independently related to any aspects of positive social learning or positive attachment parenting. The lack of independent effects of these dimensions may be due a lack of clear separation of these constructs as discussed above.

In a sub sample of the PALS study using the pre-treatment data (N=86), Matias (2006b) examined a larger range of attachment aspects ('parent positive affect', 'sensitive responding', 'mutuality') and social learning aspects ('parental attending', 'clear commands', 'vague commands', 'chain commands', 'criticism') as predictors of observed positive and negative child behaviour. These examinations offer a better separation of the two theoretical parenting aspects as parental attending does not overlap with sensitive responding. Although the argument could be made that there is some similarity between these constructs as 'parental attending' has connotations of not only social learning theory but also of attachment theory. See Appendix B for further details and definitions of measures used in these analyses. Results of correlational analysis showed that attachment parenting measures were related to positive child behaviours ('child positive affect' $r=.45$, 'child social responsiveness' $r= .69$), and also positive social learning parenting ('parental attending') was associated with 'child social responsiveness' ($r=.25$). Subscales relating to negative social

learning parenting had association with child negative behaviour ('commands/directives' r=.22; 'criticism' r= .45), but positive aspects of social learning ('parental attending') and attachment ('sensitive responding', 'mutuality', 'parental positive affect') were not predictive of negative child behaviour.

Overall, findings from analyses of the PALS sample suggest that negative parenting practices are associated with negative child outcomes, whereas positive parenting relates to children's positive behavioural outcomes such as social skills and peer relationships. Although these studies ask some novel and relevant questions in relation to social learning and attachment based parenting, there is a lack of clear separation between the content of the measures of these theoretical parenting dimensions, which makes comparisons problematic. Another significant drawback is the cross-sectional nature of analyses linking parenting to child outcomes, as most analyses are based on pre-treatment data. This makes it difficult to make conclusions with regard to the predictive and causal relationship between parenting and child outcomes, and neither do these analyses inform us about any long-term associations between parenting dimensions and child functioning.

Another study that has compared attachment and social learning constructs is that by Speltz et al. (1995), in a sample of boys aged 3 ½ - 5 ½ referred for ODD with clinical levels of aggression, and a well matched control group without behavioural problems (N=50), where observed social learning variables were compared with child attachment behaviours in terms of which of these domains best discriminated between groups. Social learning dimensions were measured using the Dyadic Parent-Child Interaction Coding System (DIPCS, Robinson & Eyberg, 1981), which is a micro-social measure that codes for frequency of events. Mother's 'critical comments' and 'commands', and children's 'deviant behaviour' and 'compliance', constituted the social learning constructs in this study. Attachment constructs were global measures of children's response to a separations and

reunion procedure that assessed ‘attachment security’ and ‘separation distress.’ Attachment security was rated by an observer on a 9-point scale according to age-specific definitions and criteria, and separation behaviour was assessed using a 25-item checklist. Results showed that child attachment constructs distinguished ODD children after controlling for social learning constructs, but social learning did not improve this prediction when attachment measures were controlled for. This study therefore suggests that for children within clinical range, conduct problems are associated with deficits in attachment security rather than social learning parenting. Although, this study did not strictly include measures of attachment parenting behaviours but assessed children’s attachment to parent, and also social learning variables were not strictly parenting variables but included child behaviours (‘defiant behaviour’ and ‘compliance’) along with parenting behaviours. Furthermore, because all parenting and child behavioural predictor variables were not entered in the same step in regression analysis, the unique contribution of parenting was not examined separately from child predictors. Other limitations of this study include the cross-sectional study design, which makes it more difficult to identify a causal relationship between parenting and child functioning, and nor does it provide insight on longitudinal associations between parenting and child functioning.

A study that has compared attachment and social learning constructs longitudinally by examining these aspects of parenting as mediators of intervention outcomes is the randomised controlled trial of prevention programme ‘New Beginnings’ for divorcing families, with a sample of children between 9 to 12 years of age (N=240) (Wolchik et al., 2000). Parenting was measured using multiple-informant and multiple-methods through parent and child questionnaires. The attachment parenting measure was ‘mother child relationship quality’, which consisted of the dimensions ‘acceptance’, ‘rejection’, and ‘communication’. The social learning related ‘maternal discipline’ was made up of the

dimensions ‘consistency of discipline’, ‘appropriate discipline’, and ‘follow-through’. Child emotional and behavioural outcomes were assessed using the ‘internalising’ and ‘externalising’ subscales of the Child Behaviour Check List, completed by both children and parents. Short-term evaluation showed that the intervention improved both the attachment related aspect (‘mother-child relationship’) and social learning parenting (‘maternal discipline’). These parenting dimensions were then tested as mediators of intervention effects on child externalising and internalising at 6 months follow-up (Tein et al., 2004). Results showed that short-term intervention effects on child externalising were mediated by ‘mother-child relationship’ as well as ‘parental discipline’ (so both attachment and social learning constructs), but internalising problems were only mediated and reduced by improvement in the ‘mother-child relationship’. Long-term follow-up of this sample 6 years later, when participants were 15-19 years of age, examined the same parenting mediators measured immediately after the intervention (Zhou et al., 2008). Mediation effects were examined separately for adolescent with high versus low baseline risks on an index of risks (child externalising, parental conflict, child negative life events, maternal mental health, contact with father, income). Results showed that for children with high baseline risks, the mother-child relationship mediated intervention effects on both externalising and internalising outcomes, but none of the parenting dimensions mediated effects for the low-risk group. This finding of moderated mediation is congruent with the study by Speltz et al. (1995), outlined previously, which found that attachment aspects best discriminated clinical groups from normal children. Together these studies highlight the salience of attachment related parenting for high risk children in particular. Another take away point from the New Beginnings study is that the attachment related parenting dimension appears to be a shared predictive factor for child externalising and internalising, and it may therefore be an explanatory factor in the high comorbidity between these child difficulties as noted in the previous chapter. This study also indicated that the joint contribution of social learning and

attachment parenting (Greenberg et al., 1993) applies predominately to conduct problems but not to emotional problems, although this was only for short-term child externalising whereas long-term externalising problems were predicted only by the attachment related parenting dimension. As for the limitations of the New Beginning study, both parenting and child outcomes were assessed through parent and child questionnaires and no observational measures were used. There is therefore a lack of independent assessment of these outcomes and method overlap between mediators and outcomes may have influenced results. Another limitation is in relation to the comparative examination in this this study, as social learning and attachment parenting constructs were not included simultaneously in the analytical models, and therefore no direct comparison between these two parenting dimensions is provided.

2.7. The current study

2.7.1. Aims and research questions

This study focuses on early positive parenting practices associated with attachment theory and social learning theory. Parenting practices related to these theoretical frameworks ('warmth' and 'effective management') are examined as predictors of child conduct ('externalising') and emotional ('internalising') problems. The main aims of this study are: 1) to examine and compare parenting dimensions 'warmth' and 'effective management' as predictors of child conduct and emotional problems; 2) to study these two theoretical parenting dimensions as complementary factors that interact in predicting child outcomes, and 3) to investigate the extent to which early parenting during the toddler years has enduring effects on child outcomes, over and above later parenting at early school age. The research questions linked to these study aims are:

Parental warmth and effective management as predictors of child functioning

1. Does early parental warmth (age 2-3) predict child externalising and internalising behaviour at age 3, 4, 5 and 7.5? [1]

2. Does early parental effective management (age 2-3) predict child externalising and internalising behaviour at age 3, 4, 5 and 7.5? [2]

Parental warmth and effective management as unique and interactive predictors of child functioning

3. Do both early parental warmth and early effective management (age 2-3) predict child externalising and internalising behaviour at age 3, 4, 5 and 7.5, and do these parenting dimensions interact over and above their additive effects in predicting these child outcomes? [1 2 3]

4. Do early parental warmth (age 2-3) and later effective management (age 5) predict child externalising and internalising behaviour at age 5 and 7.5, and do these parenting dimensions interact over and above their additive effects in predicting these child outcomes? [4]

Early versus later parental warmth and effective management as predictors of child functioning

5. Does early parental warmth (age 2-3) predict child conduct and emotional problems at age 5 and 7.5 when parenting at age 5 is controlled for? [1 5]

6. Does early parental effective management (age 2-3) predict child conduct and emotional problems at age 5 and 7.5 when parenting at age 5 is controlled for? [2 5]

7. Do early parental warmth and early effective management (age 2-3) predict child conduct and emotional problems at age 5 and 7.5 when parenting at age 5 is controlled for? [1 2 5]

[1] Testing attachment theory (Bowlby, 1988; Ainsworth et al., 1978)
[2] Testing social learning theory (Gardner, 1987; Patterson, 1982)
[3] Testing Baumrind's (1966) authoritative parenting style and Richter's and Waters (1991) 'motivational model'
[4] Testing Greenberg et al (1991) 'risk model' and Shaw and Bell's (1993) 'bridging model'
[5] Testing 'enduring effects' versus 'revisionist' perspectives

2.7.2 The contribution of the current study

This doctoral study expands upon the relatively small number of existing empirical studies that have examined parenting from attachment theory and social learning theory in terms of their association with child functioning. Furthermore, it addresses several of the limitations of previous examinations, and thereby provides a more robust investigation than most previous studies. One of the main advances of the current study is that it directly compares the two theoretical parenting dimensions by testing these simultaneously. It thereby obtains the unique effects of these aspects of parenting in terms of their prediction of child outcomes. Another novelty of this study is that it tests interactions between the two theoretical parenting dimensions, and it thereby tests theoretical models suggesting that attachment and social learning aspects may be interrelated in influencing child functioning. Bidirectional effects between parenting and child functioning are also examined and therefore this study adds to the emerging body of research on reciprocal effects.

Methodologically this study has a number of strength in comparison to previous examinations. The current study uses a longitudinal design with a large sample of children and parents who were followed up at regular intervals through key developmental stages from toddler age to early school age. This allows for the exploration of parenting practices as predictors or short-term and long-term outcomes, and as predictors of change over time in child functioning. Using two measurement points of parenting, in toddlerhood and at early school age, allows an examination as to whether there are enduring effects of early parenting over and above later parenting. Furthermore, the structural equation modelling methodology used in this study permits sophisticated analytical modelling of longitudinal data, including latent growth curve modelling and autoregressive cross-lagged modelling. Another advantage of this study is that parenting behaviours are observed measures, which are thought to be more reliable than relying on parents' own reports. Because child behaviour in

this study is parent reported, using observed parenting measures also minimises method effects. A further strength of this study that minimises bias, is the inclusion of relevant covariates that adjust for factors other than parenting that might influence child outcomes. Accounting for these factors means that the estimates of parenting, as far as possible, are independent effects on child conduct and emotional problems. The following chapter describes in further details the methodological approach used in this study.

CHAPTER 3: Methods

3.1. Design

The current study examined its research questions using data from the Early Steps (ES) study, which is an ongoing US based longitudinal study (Dishion et al., 2008). Since 2002/2003 this study has followed a cohort of 731 children and their parents, starting when children were 2 years old, with follow-up assessments taking place at age 3, 4, 5, 7½, 8½, 9½ and 10½, and with current assessments at age 14 nearly complete. Half of the sample was randomised to receive the Family Check-Up (FCU) parenting intervention and the original study is a randomised controlled trial designed to evaluate the effectiveness of this intervention. See Appendix C for further detail of the FCU and intervention procedures. The appropriateness of using both the treatment and control group was tested, and these results are presented on pages 160-161. The current study uses data from child age 2 to 7½.

3.2. Sample

The population eligible for participation in the Early Steps study was parents with children aged 2 years (25-35 months) assessed as being at risk of future conduct problems. Parents (largely mothers) and their toddlers were recruited from the federally funded Women, Infants and Children (WIC) programme, which provides nutritional supplement and education to women with young children who are at nutritional risk because of low income. There were three study sites: Pittsburgh (PA), Eugene (OR), and Charlottesville (VA). Mothers and their 2 year olds were eligible for participation if they had at least two risks factors from three domains: 1) child behaviour (conduct problems and high conflict relationship with adults), 2) family problems (maternal depression, daily stress, substance

use, single parent), 3) socio-demographic (low income, low education). Across the three recruitment sites, a total of 1,666 mothers and their two year olds were screened for eligibility, and 878 (around half) met these criteria. These were all invited to participate in the study, with a final sample of 731 (83%) responding.

3.3. Assessment procedures

In the Early Steps study, parenting practices were measured using direct observation of parent-child interactions, and child behavioural and emotional problems were measured through parent questionnaire reports. Assessments of children and their families were carried out in home visits lasting around 2 ½ hours. Visits started with the parent completing questionnaires, which included measures of child behaviour, parental depression, demographics, and other measures. Whilst the parent completed questionnaires, the child was given a toy and engaged in 15 minutes of free-play. This was followed by a series of more structured tasks in which the caregiver was observed interacting with their child. This involved a clean-up task (5 min); a delay of gratification task (5 min); four teaching tasks (3 min each); another free play task (4 min); a second clean-up task (4 min); an inhibition inducing exercise (4 min); and a meal preparation and lunch task lasting 20 minutes. All assessment sessions (around 55 minutes in total) were video recorded for later coding using the Relationship Affect Coding System (RACS; Peterson et al., 2008), which is a micro-social coding system that codes the frequency and duration of parent-child interactions. In addition, video coders completed the Coder Impressions Inventory (COIMP, Dishion et al., 2004), which is a macro-social or global measure of overall impressions of observed parent-child interaction. Home visitors also provided global ratings of their impressions of the family immediately after their visit, using subscales from the Home Observation for Measurement of the Environment (HOME; Bradley & Caldwell, 1979; Bradley et al., 2001)

with some supplemented items created specifically for the Early Steps study. Families were paid $100 for their participation in the first assessment at age 2 and this amount increased with follow-ups. Below are further details of the assessment tools and the specific measures that were used to answer the research questions in the current study.

3.4. Measures

3.4.1. Parenting

The present study used observed global measures of parenting behaviour (COIMP and HOME) rather than micro-social and quantifiable parenting behaviours (RACS). The primary reason for not making use of the RACS was that this event coding system does not allow for a separation of positive parenting behaviours belonging to social learning theory from behaviours associated with attachment theory. This is related to the structure of this coding system where affect is the central feature and interactions are primarily classified as positive, negative or neutral, with further coding of whether behaviours are verbal or physical. An overview of the codes in the RACS is provided in Appendix A. In addition, this micro-social measure does not just measure parent practices, but it captures dyadic interaction which includes the child's behaviour and affect towards the parent. Although reciprocal and dyadic behaviour is likely to be important for child outcomes, and some analyses in this thesis include examination of effects of child behaviour on parenting, the main focus of this thesis is on parent lead behaviours. For these reasons, global parenting measures were used in this study, as these allowed for attachment related parenting to be separated from social learning parenting, and these measures were be more clearly defined as parent-lead behaviours.

In their original form, both of the HOME and the COIMP include items related to parenting associated with attachment and social learning. In previous examinations of parenting in the Early Steps sample, items from these instruments have been combined in a composite measure of positive parenting that includes aspects of parenting related to both attachment and to social learning (Dishion et al., 2008; Waller et al., 2015). In the current examination it was decided not to combine items across instruments when creating the parenting constructs 'warmth' and 'effective management'. This was because items tended to cluster around instruments (methods effect), as well as around their theoretical parenting construct, which resulted in large correlations between constructs. This makes it difficult to compare parenting dimensions in terms of their prediction of child outcomes, as theoretical differences may be supressed by overlapping methods. This phenomenon, sometimes called the GLOP effect, was described by Bank et al. (1990). The implications of separating instruments by measuring 'warmth' using items from the HOME, and measuring 'effective management' using variables from the COIMP, are discussed later in relation to the findings of this study. Exploratory and confirmatory factor analyses on parenting measures were carried out as part of the preliminary analyses, which are reported later in Chapter 4. Details of the two theoretical parenting measures and their respective items are further below.

As outlined above in Chapter 2, social learning research has traditionally used micro-social measures. In the current study, the use of a global measure for assessing social learning parenting is therefore a break with the norm. However, as outlined below, the content and substance of this measure is very much in line with the field of social learning parenting research. Using a global measure for both theoretical parenting constructs may even have the advantage of allowing for a better comparison of parenting dimensions, which is the primary focus of this thesis. The use of a global measure to capture attachment related behaviour is consistent with the research tradition within attachment theory, although the

focus in attachment research is usually children's behavioural manifestations of their attachment style rather than parenting associated with attachment. The recently developed CARP (Matias et al., 2006a), referred to above, is an example of a global observational coding system for capturing attachment related parenting behaviours. As detailed below, there is some overlap between the CARP and the attachment parenting measure used in the current study in terms of the substantial content of these measures.

3.4.1.1. Attachment related parenting: warmth

In this study, parental *warmth* represents attachment related parenting and involves the parent's display of positive affect towards the child. This was measured through an adapted version of the Infant Toddler Home Observation for Measurement of the Environment (IT-HOME; Bradley et al., 2001; Caldwell & Bradley, 1979). The IT-HOME assesses the quality of the naturalistic environment in which the child develops, including aspects of caregiving. It was originally designed for longitudinal studying of the impact of the home environment on development, and it has been shown to be suitable for use in at-risk populations (Totsika & Sylva, 2004).

The original IT-HOME has 45 items and 6 subscales: 1. emotional and verbal responsivity; 2. parental involvement with child; 3. avoidance of restriction and punishment; 4. organisation of the physical and temporal environment; 5. provision of appropriate play materials; 6. opportunities for variety in daily stimulation. The Early Steps study administered the first three of these subscales which relate to parenting behaviours. Although the HOME includes parent interview items, assessments in this study were based solely on examiner observation and items that required caregiver reports were excluded. The instrument was completed by the researcher who visited the home and administered the various questionnaire measures in the interview, and parent-child interaction tasks. In the

current study, 3 items are used from the HOME related to emotional responsiveness of the parent, and which capture the extent to which the parent shows positive affect towards the child. Added to this is one item developed for the Early Steps study. The 4 items measuring the construct parental warmth in the current study are: 'parent's voice conveys positive feelings towards child'; 'parent caresses or kisses child at least once during visit'; 'parent responds positively to praise offered by visitor to child'; and 'parent is warm and friendly'. Response options for the first three questions are binary (yes and no), whilst the last is responded to on a five-point Likert scale (1= very inaccurate'; 2=somewhat inaccurate; 3=neither; 4=somewhat accurate; 5=very accurate). See the results in Chapter 4 for details of exploratory and confirmatory factor analysis, and reliability and validity of this measure.

The HOME has been used extensively in studies that examine the relationship between aspects of the home environment and child developmental outcomes. The emotional and verbal responsivity subscale, which makes up most of the warmth measure in the current study, has been shown to be associated with secure attachment (NICHD Early Child Care Research Network, 2001). A previous study that has used the HOME to measure parental warmth in relation to child developmental outcomes is that by Gershoff et al. (2007), which used 5 HOME items to measure parental warmth.

In comparison with other measures of attachment related parenting, the substantial content of the 'warmth' construct used in the current study has some overlap with aspects of the CARP that was developed for a previous study (Matias, 2006b; Matias et al., 2006a; O'Connor et al., 2013). In the CARP, the operational definition of 'parent positive affect' is compatible with 'warmth' items in the current study, and the CARP dimension 'sensitive responding' also includes parental warmth as part of its operational definition (see Appendix B for details).

3.4.1.2. Social learning related parenting: effective management

The social learning construct in the current study is *effective management*. This reflects the parent's display of child management skills, such as directing, using clear communication, setting limits, and responding to the child's good and bad behaviours. This is measured through the global or macro-social instrument, the Coder Impressions Inventory (COIMP; Dishion et al., 2004). As noted above, this is completed by the researcher coding the video recorded parent-child interactions, and is supplemental to these micro-social observations. It captures the coder's overall impressions of the interactions. The COIMP has 53 main items in addition to some sub-items, and the full measure comprises of six subscales on parenting (promotes positive behaviour; warmth and affection; monitor and tracking; limit setting; proactive parenting; emotional dysregulation). There was an inter-rater agreement of 85% on the COIMP, based on random checks of 15% of the sample.

In this study, effective management was measured by 4 items related to appropriate discipline and management of the child: 'Parent uses directives that are specific and clear'; 'parent sets limits firmly without using aversive control'; 'parent is appropriately consistent in responding to positive and negative child behaviour'; and 'parent seems in control/leadership of the child'. These items were scored on a nine-point Likert scale with end and middle points representing: 1=not at all; 5=somewhat, and 9=very much. See the results in Chapter 4 for details of exploratory and confirmatory factor analysis, and reliability and validity of this measure.

Very similar coder impressions observational measures to the COIMP have been used in previous evaluations of family and parent interventions, for example the Incredible Years (Webster-Stratton et al., 2001), Multisystemic Therapy (Dekovic et al., 2012), and the Fast Track intervention (Pasalich et al., 2015).

In terms of definition and content, the measure of parenting related to social learning 'effective management' that was used in the current study, is comparable to the dimension 'child-centred behaviours' in the Parent Behaviour Coding Scheme (PBCS), which has been used in previous studies examining parenting related to social learning and attachment (Matias, 2006b; O'Connor et al., 2013). See Appendix B for operational aspects of this dimension of the PBCS.

2.4.1.3. Aggregating parenting across age 2 and 3

The focus of this study was to examine the association between early parenting and children's later outcomes. In the Early Steps dataset, early parenting was assessed both at age 2 and age 3, and these assessment points were aggregated rather than analysing both separately as predictors of child outcomes. Assessment points were aggregated at item level in order to accommodate these as indicators of latent variables in structural equation models.

There were a number of reasons for aggregating assessment points. A main reason was to reduce the number of analyses in this study, as there were two parenting dimensions and examining these at both age 2 and age 3, as predictors of child externalising and internalising at age 3, 4, 5 and 7.5, would result in a large number of analyses. With a large amount of repeated analysis comes the risk of type 1 error or false positives. An alternative would have been to just choose either age 2 or age 3 to represent early parenting. However, given the two theoretical aspects of parenting being explored, it was difficult to decide which of these assessment points would be the most appropriate. Using Erikson's stages of child development (Erikson, 1950) presented earlier in Chapter 2, one might expect attachment related parenting to be more salient at age 2 and social learning parenting becoming more relevant at age 3. These assessment points might therefore be when these theoretical aspects of parenting overlap and where comparisons of the two dimensions of parenting are best made.

Methodologically it may also be an advantage to aggregate parenting across two assessment points, as this has the potential to provide a more robust and stable measure of early parenting than using just one assessment point (Rushton et al., 1983). In the current study, the aggregated measures were more predictive of later parenting at age 5 than either of the age 2 and age 3 assessments on their own, and the aggregated measures were also more predictive of child outcomes (externalising and internalising) at age 3, 4, 5 and 7.5. One consideration when aggregating these assessment points across different ages was the intervention design of the original study. At age 3, half of the sample had received the intervention, and aggregation was therefore across pre and post intervention assessments, which means that the intervention could have affected parenting at age 3. However, analyses showed that at age 3 there were no intervention effects on either of the parenting aspects examined in this study. Although the FCU has demonstrated to have effects on other parenting measures and on various child outcomes (Dishion et al., 2008; Lunkenheimer et al., 2008; Shaw et al., 2009; Brennan et al., 2013).

Also other studies examining longitudinal associations between aspects of parenting and child outcomes have used the approach of aggregating early parenting assessment points, for example Kochanska et al. (2004) who looked at moderators of these associations.

3.4.2. Child outcomes

3.4.2.1. Child behavioural and emotional problems

The Child Behaviour Checklist (CBCL, Achenbach & Rescorla, 2000, 2001) was used for assessing child conduct and emotional problems. The CBCL is a well-known tool and widely used in child developmental research. There is a preschool version for children aged 1.5 to 5 years (CBCL/1.5-5) that in this study was used for assessing child outcomes at age 2

3 and 4, and there is a version for school aged children 6-18 years (CBCL/6-18) that was used for assessing children at age 5 and 7.5.

The preschool version (CBCL/1.5-5) has 99 items of child problem behaviour that make up 7 syndrome scales (attention problems; aggressive behaviour; emotionally reactive; anxious/depressed; somatic complaints; withdrawn; sleep problems) and 6 of these scales fall into two broadband measures of child problems*: externalising* (attention problems; aggressive behaviour) and *internalising* (emotionally reactive; anxious/depressed; somatic complaints; withdrawn).

The school age version (CBCL/6-18) has 120 items, some of which overlap with the preschool version, but many questions are adapted or added to reflect the manifestation of problem syndromes in older children. This version of the CBCL has 8 subscales (anxious/depressed; withdrawn/depressed; somatic complaints; social problems; thought problems; attention problems; rule-breaking behaviour; aggressive behaviour) and 5 of these make up the broadband scales *externalising* (rule-breaking behaviour; aggressive behaviour) and *internalising* (anxious/depressed; withdrawn/depressed; somatic complaints). Note that slightly different subscales make up the externalising and internalising broadband measures in the school age version compared to the preschool version because of developmental considerations of how problems differ in younger and older children.

In this study, child conduct problems were measured using the externalising factor, and child emotional problems were measured using the internalising factor. Parents/primary caregivers rated how true problem behaviours were for their child on a three point Likert scale of ‘not true (as far as you know)’, ‘somewhat true or sometimes true’, or ‘very true or often true’.

Both versions of the CBCL have demonstrated good validity by discriminating well between clinical and non-clinic referred children (Achenbach & Rescorla, 2000, 2001), and

they also correlate well with other established measures of child problems, such as DSM criteria (Keenan & Wakschlag, 2000), and with the Strengths and Difficulties Questionnaires (SDQ; Goodman & Scott, 1999). In terms of reliability, the CBCL has shown good psychometric properties with test-retest reliability at 8 days intervals with a correlation of r=.87 for externalising and r=.90 for internalising for CBCL/1.5-5 (Achenbach & Rescorla, 2000), and for the CBCL/6-18 correlations of r=.92 for externalising and r=.91 for internalising (Achenbach & Rescorla, 2001). A high inter-item consistency has been reported by developers, α =.90 and α =.91 for internalising, and α =.87 and α =.92 for externalising, for the preschool and school age versions respectively. Parent-reported externalising and internalising at child age 2, 3, 4, 5 and 7.5 were used in the current study. Across these ages internal consistency ranged between α =.86-.94 for externalising, and between α =.80-.87 for internalising.

3.4.3. Control variables

As outlined previously in Chapter 1 of this thesis, a range of parent and family characteristics (socioeconomic, demographics, parent mental health), as well as factors individual to the child (existing child problems, child gender), have been associated with children's conduct and emotional problems. Therefore a number of control variables were included in analyses in order to adjust for any confounding factors and thereby ensuring more accurate estimates of the independent effects of parenting. Covariates were: child externalising/internalising problems at baseline, child gender, intervention status, parent race, family income, parent education, parent depression, and parent age. Because previous research has demonstrated that many of these covariates predict child outcomes partly through parenting (i.e. mediation, see Chapter 1 for literature), these background variables were specified to have direct as well as indirect or mediated effect on the child outcomes

predicted in the analytical models. In autoregressive cross-lagged models, covariates were modelled onto all repeated measures of parenting and child outcomes, as it is conceivable that these background variables exert influence not just at one point, but at every point in time. This is with the exception of the covariate for intervention status, which was not modelled onto child behaviour at age 2 because the intervention had not yet taken place. Although intervention status was controlled for in all analyses, the reality of half of the sample receiving an intervention could be problematic if the intervention changes the relationship between parenting and child outcomes. Therefore, preliminary analyses were carried out in order to examine whether there are any significant and systematic differences between the intervention group and control group in terms of the relationship between parenting and child outcomes. If there is, then it would be less appropriate to use the whole study sample. These results are presented later in Chapter 4.

3.4.3.1. Demographic questionnaire

Information on parent and family demographics were ascertained at baseline at child age 2 during the first home visit where demographic questionnaires were administered to parents (Dishion et al., 2008). Household income was measured in 13 categories and is treated as a continuous variable. Parent age in years was also continuous. Other categorical variables were collapsed into binary categories, such as parent education (less than high school) and parent race (white). Child gender was of course already binary.

3.4.3.2. Parent depression

The widely used instrument Center for Epidemiological Studies Depression Scale (CES-D; Radloff, 1977) was used to assess caregiver depressive symptoms. This consists of 20 items of depressive symptoms (e.g. ‘I felt that I could not shake off the blues, even with help from my family and friends’, ‘I did not feel like eating; my appetite was poor’, ‘I felt fearful’, ‘I

had crying spells'). Parents were asked how often they had experienced symptoms in the last week, and responses were on a four-point Likert scale: 0 ('less than 1 day'), 1 ('1-2 days'), 2 (3-4 days'), 3 ('5-7' days). These scores were added up to form the total depression score, which can range from 0 to 60. A score of 16 or above is considered within clinical range. In terms of internal consistency, the CES-D has demonstrated good reliability (α=.85; Radloff, 1977) and in the current sample inter-item reliability was α=.76 at age 2 (baseline) assessment.

3.5. Data analysis

3.5.1. Attrition and missing data

In terms of retention rates of the full sample of 731 parent-child dyads who were assessed at baseline at age two, 659 (90%) were followed up at age three, 619 (85%) at age four, 621 (85%) at age five, and data were collected from 560 (77%) at child age seven and a half. Missing data was therefore predominately unit non-response rather than item non-response (Schafer & Graham, 2002). Data can be missing completely at random (MCAR), missing at random (MAR), or missing not at random (MNAR) (Little & Rubin, 2002). The amount of missing data is also important and the rule of thumb is that if more than 5% of data is missing this cannot be ignored (Schafer, 1999).

Missing Value Analysis (MVA) was carried out in order to examine individual study variables for amount of missing data and to identify any pattern in the absence of the data. Results of the MVA are shown in Table 3.1 below. The parenting construct effective management had 19.4%, 22% and 22.8% of missing data at child age 2, 3 and 5 respectively. For the construct parental warmth these figures were 0.1%, 12.2% and 21.6% for these respective ages. As for child outcomes externalising and internalising, an equal amount of

data was missing at each age as these were measured using the same (CBCL) assessment tool; 0.1% was missing at age 2, 10.1% at age 3, 15.3% at age 4, 16.3% at age 5, and 22.4% at age 7.5. Little's MCAR chi-square test was used as an indicator of whether or not data was missing completely at random (MCAR). For parenting and child variables with substantial amounts of missing data, this test showed that data was not MCAR, but either MAR or MNAR (the test does not distinguish between these). Further t-tests showed that all parenting variables (except age 2 warmth, which had only one missing case), as well as all child externalising and internalising outcomes age 4, 5 and 7.5, had missing data that were related to one or more parent socioeconomic or demographic variables (low education, lower income, younger parent, and non-white race). Overall, the missing value analysis indicated that for many main study variables there was a moderate amount of missing data that could not be ignored and that should be dealt with on the assumption of MAR/MNAR rather than MCAR.

Traditional approaches for handling missing data include deleting missing cases, or mean imputation where the mean of all available cases is inserted. However, such methods are now regarded as outdated and inappropriate (Baraldi & Enders, 2010). Mean imputation is problematic as it decreases variability and can therefore lead to biased estimates. Deleting cases reduces the sample size, thereby reducing statistical power, and deleting cases when the MCAR assumption is violated can bias results. New and more advanced methods have been developed for dealing more appropriately with missing data. These include methods such as multiple imputation (MI), full information maximum likelihood (FIML), and expectation-maximization algorithm (EM) (Dong & Peng, 2013).

In structural equation modelling, FIML is often used. This method has been demonstrated to be superior compared to alternative approaches in terms of convergence, parameter estimate bias, parameter estimate efficiency, and model goodness of fit (Enders &

Bandalos, 2001), and FIML was therefore used for handling missing data in the current study. However, FIML can only be used with the ML or MLR estimators but cannot be applied in the models in this study that use the WLSMV estimator. Analyses with the WLSMV estimator still use all available data but rather than 'filling out the gaps' as in FIML a pairwise deletion approach is used.

Table 3.1: Results of missing value analysis

		Missing			Missingness related to variables (t-tests)										
Missing variable	**N**	**Count**	**Percent**		**Effective management age 2**	**Warmth age 2**	**Child externalising age 2**	**Child internalising age 2**	**Intervention**	**Child gender**	**Race (non-white)**	**Education**	**Parent age**	**Family income**	**Parent depression**
Effective management age 2	589	142	19.4			H		H			YES	L			
Effective management age 3	570	161	22					H			YES	L			
Effective management age 5	564	167	22.8									L	L	L	
Warmth age 2	730	1	0.1												
Warmth age 3	642	89	12.2									L			
Warmth age 5	573	158	21.6									L	L	L	
Internalising age 2	730	1	0.1												
Externalising age 2	730	1	0.1												
Internalising age 3	657	74	10.1												
Externalising age 3	657	74	10.1												
Internalising age 4	619	112	15.3											L	
Externalising age 4	619	112	15.3											L	
Internalising age 5	612	119	16.3			H						L		L	
Externalising age 5	612	119	16.3					H				L		L	
Internalising age 7.5	567	164	22.4									L			
Externalising age 7.5	567	164	22.4									L			
Intervention status	731	0	0												
Child gender	731	0	0												
Child race	730	1	0.1												
Less than high school education	731	0	0												
Parent age	725	6	0.8												
Family income	723	8	1.1												
Parent depression	729	2	0.3												

Notes: H = Higher, L=Lower

In addition to applying methods for dealing with missing data it is important to consider the potential effect of missing data on the results of the current study. As shown in the MVA, missing data was related to multiple socioeconomic family risks, and because the relationship between parenting and child functioning is likely to be larger in high risk groups, this means that that estimates reported in the current study may be conservative. Although, because the Early Steps sample generally was a high risk sample (inclusion criteria was two risk factors) the effect of missing data, following the pattern seen in this study, is likely to be less than for samples that are more representative of the general population, where attrition of high risk groups may more severely bias results.

3.5.2. Bivariate correlations

The first step of data analysis was correlation analysis of all study variables in order to preliminarily explore cross-sectional and longitudinal relationships between study variables. This is a good starting point for inspecting the degree of continuity of the two respective parenting constructs, and of child externalising and internalising, and as well as examining the zero order correlations between parenting and child outcomes. The relationship between demographic/socioeconomic characteristic of the child and the family, and parenting behaviours and child outcomes, were also inspected from these correlations.

3.5.3. Structural equation modelling (SEM)

The substantial research questions of the study were addressed in a series structural equation models (SEM) carried out in Mplus Version 7.2 (Muthén & Muthén, 2012a). SEM is suitable when examining relationships between variables where independent variables, dependent variables, or both, are abstract or theoretical variables (latent constructs) that

cannot be measured directly through a single item but are measured using multiple indicators (Bowen & Guo, 2011). In this study, both of the predictor parenting variables ('effective management' and 'warmth') were latent constructs measured through multiple items as described above. SEM combines factors analysis with traditional regression equations (Bowen & Guo, 2011; Ecob & Cuttance, 1987). The factor analysis part of SEM assesses how well the items measure latent constructs, whereas the regression part examines the structural relationships between variables in the model, which can be latent or observed variables. The advantage of SEM over traditional Ordinary Least Square (OLS) regression is also that it allows relationships between predictor variables included in the model (parenting) to be examined whilst simultaneously examining these as predictors of outcomes (child externalising and internalising). It also permits direct and indirect effect to be examined. SEM has the advantage of offering a flexible and more advanced approach to data analysis. This study used a number of SEM techniques, including models with interactions, latent growth curve modelling (LGCM), and longitudinal autoregressive modelling, all of which are outlined further below.

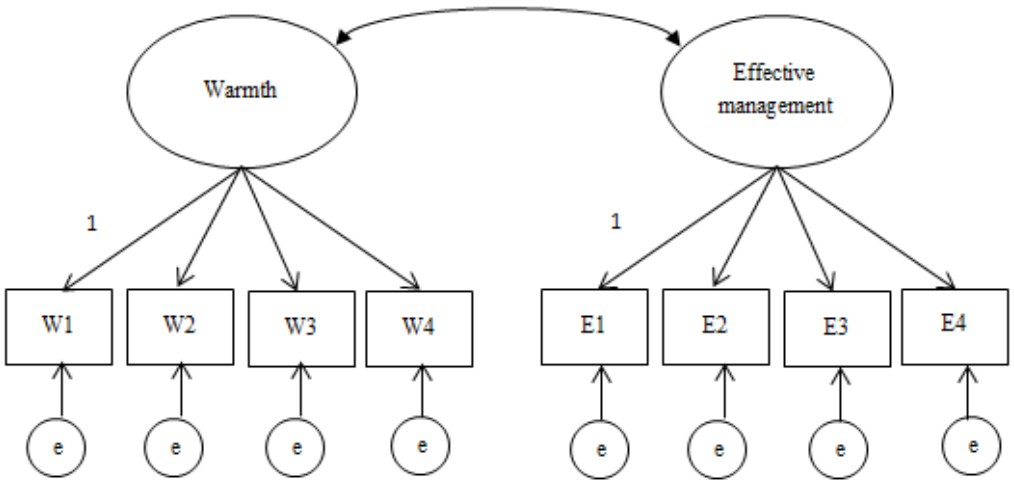
3.5.3.1. Factor analysis

Before running full SEM models with parenting as predictor of child outcomes, exploratory and confirmatory factor analysis were carried out on age 2-3 and age 5 parenting items. This was to examine how items loaded on the two parenting factors, whether they formed two distinct factors, and if items measured the parenting constructs well and were suitable for use in the structural equation models examining the substantive research questions.

First, exploratory factor analysis (principal component analysis) was carried out in SPSS version 21 (IBM, 2012). This was performed using oblique rotation (oblimin with Kaiser normalization) as it was expected that the factors might be correlated (Field, 2009).

Then confirmatory factor analysis (CFA) was carried out using MPlus version 7.2 (Muthén & Muthén, 2012a). The hypothesised measurement model is presented in Figure 3.0 below. This specifies the two latent parenting variables, 'warmth' and 'effective management', and the items (indicator variables) that are thought to load on each of these latent variables. For each latent variable, one indicator variable was fixed at 1, which is necessary for scaling and identification of the latent variables (Bowen & Guo, 2012). By fixing one indicator the latent variable is set to the same scale as the indicator variable. Fixing loadings also means that there are fewer parameters to be estimated and that there are positive degrees of freedom. This is referred to as an 'overidentified' model, meaning that there are more known than unknown parameters, which is preferred in SEM. Although parenting constructs belong to two different theoretical frameworks, both represent dimensions of positive parenting and parents who are warm are also likely to be effective managers of their children, as discussed in the background section. Therefore, the two latent parenting variables were hypothesised to be correlated. In the CFA model, shown in Figure 3.0, this correlation is specified by the curved connecting arrows.

Figure 3.0: Hypothesised measurement model for theoretical parenting constructs



3.5.3.2. Latent growth curve modelling

Latent growth curve modelling (LGCM; Duncan et al., 2006; Preacher et al., 2008; Kline, 2011) is a significant advancement of ANOVA and traditional multiple regression methods for analysing longitudinal data, as it is able to analyse individual differences in change over time. It has strong parallels with multilevel modelling (MLM; Bryk & Raudenbush, 1987; Raudenbush & Bryk, 2002) and results of MLM are comparable to LGCM. However, because LGCM is based on SEM it possesses all the advantages associated with this methodology, namely the flexibility and adaptability of SEM to deal with special data requirements (Preacher et al., 2008).

LGCM was used in further analysis in relation to research questions 1 to 3, which examined early parenting practices as predictors of child functioning. The first set of SEM analyses examined parenting in relation to each assessment point of externalising and internalising (at age 3, 4, 5 and 7.5 respectively), where latent variables are centred (means of zero) and provide no information about mean of these child outcomes. By contrast, in LGCM, mean structures are used and are able to study mean change over time and individual differences in change (Kline, 2011). LGCM allows the study of intra-individual (within-person) change across a period of time, and the inter-individual (between-person) variability in intra-individual change (Preacher et al., 2008). In other words, this modelling technique looks at differences between individuals in terms of how they change across time. Studies that use LGCM often investigate variables that explain variability in individuals' trajectories (growth) over time (e.g. Leve et al., 2005; Mesman et al., 2009; Miner et al., 2008). In the current study, latent growth curve models examined the two theoretical parenting aspects (warmth and effective management) at age 2-3 as predictors of child trajectories of externalising and internalising from age 3 to 7.5. A requirement of LGCM using a SEM approach is that 1) a continuous dependent variable is measured across at least three time

points, 2) that the unit of measurement is the same for all measurements points and not standardised, and 3) that data are time structured and time points are measured at the same, but not necessarily equal intervals (Kline, 2011). The repeated measures of child externalising and internalising available in this study meet all of these requirements.

LGCM is a special case of SEM where the key latent variables are not constructs that represent underlying measures, but instead latent variables are factors that represent growth or change (positive or negative direction) in a measure over time (Preacher, 2008). Main features of LGCM are the intercept and slope, which represent the latent factors in these models, and their indicators are repeated measures of a variable. In this study the indicators of the intercept and slope factors are child externalising and internalising measured at age 3, 4, 5 and 7.5. The intercept factor is the start point or baseline for these measures, and is comparable to the intercept in a linear regression. The slope factor represents rate of change in the repeated measure, similar to the regression line in OLS regression, but in LGCM the line signifies covariance with time (trajectory), rather than covariance with another variable as in OLS regression. The intercept and the slope factors have a mean, which represent the average starting point and the average trajectory for the sample, and they have variances that reflect individual differences in starting point and in trajectory.

LGCMs were carried out in two steps as recommended by Kline (2011). The first step examined the *unconditional* LGCM, which is just the trajectory of child externalising and internalising from age 3 to 7.5. This model was assessed in terms of variability in the intercept (age 3 child functioning) and variability in the slope (change through to age 7.5), as there has to be sufficient variability between individuals on these factors in order for subsequent models to be able to predict some of this variance. The unconditional model was also examined in terms of fit with the data and appropriate adjustments were made to achieve an acceptable fit before proceeding to the second step of modelling. The second step

was the *conditional* LGCM where parenting variables (warmth and effective management) were tested as predictors of child externalising and internalising trajectories. Parenting measures were also latent variables and were described and specified previously in this chapter. In the conditional model, covariates were also included and these were modelled to predict the dependent variable (externalising and internalising trajectories) and the parenting predictor variables (warmth and effective management).

There are certain conventions for the specification of LGCM models (Duncan et al., 2006; Kline, 2011, Preacher et al., 2008) that were followed in this study. The intercept is a constant and should be fixed at 1 for each factor loading of the repeated measure. Loadings for the slope factor must be fixed to at least two different values in order for models to be identified, and usually the loading of the first measurement point is fixed at 0 and the following loading at intervals that represent the spacing of time between assessments. So in the current study, where child externalising and internalising outcomes are measured at age 3, 4, 5 and 7.5, and assuming that the slope fit a linear pattern, it would be appropriate to fix factor loadings at 0, 1, 2, and 4.5. Other growth patterns are possible, such as quadratic and cubic curves, which can be defined by adding another growth factor with factor loadings that are specified according to the hypothesised shape of the slope. So for a quadratic curve, slope factor loading would be fixed at 0, 1, 4, and 9 in a model with 4 measurement points at equal time interval (Kline, 2011). In this study, a strictly linear growth pattern did not fit the data well, and therefore a *spline model* was used which involved free estimation of some of the time scores (Muthén & Muthén, 2012b). This easy accommodation of non-linear data using a spline model is on one of the advantages of LGCM over MLM methods.

Another convention in LGCMs is that intercept and slope factors are specified to covary, which is indicated in the SEM diagram by a double arrowed path between factors. This estimate provides information on whether initial level of the measure is related to the

rate of change of the measure over time. So in this study it will tell us if initial level of child externalising and internalising problems at age 3 is associated with the rate at which children change on these measures over time through to age 7.5.

3.5.3.3. Interaction effects

For estimating interaction effects in research questions 3 and 4, the latent moderated structural equation method (LMS, Klein & Moosbrugger, 2000) was used. This is a two-step procedure where the model is first estimated without the interaction term, i.e. including just the main effects of the latent variables, and then in a second step the latent interaction term is added. This two-step approach is recommended when assessing LMS interaction models in MPlus (Maslowsky et al., 2015) as this software does not produce standardised coefficients (β) for interaction models and neither does it generate output for variance explained by the interaction (r^2) or the model overall ($R^{2)}$. However, MPlus output enables the manual calculation of R^2 using the formula provided by Malsowsly et al. (2014), and this can then be compared to the R^2 for the model with main effects only. Any increase in R^2 between these two steps then signifies the variance explained by the interaction (r^2). The standardised coefficient of the interaction path was estimated by taking the square root of the manually calculated r^2. Model fit statistics is also absent in MPlus output with latent interactions, however where the model with main effects (step 1) had a good fit and where the interaction is significant (step 2), a good model fit is also assumed for the interaction model. In their simulation study, Klein & Moosbrugger (2000) showed that the latent moderated structural equation (LMS) method is robust even when data is non-normally distributed, as is the case with the latent variable indicators in the current study.

3.5.3.4. Autoregressive cross-lagged models

For the examination of research questions 5 to 7, which compare earlier and later parenting practices in terms of predicting child functioning, autoregressive cross-lagged models or

autoregressive panel-models were used (Selig & Little, 2012). As highlighted by Fraley et al. (2013), these types of models are particularly useful for the examination of enduring effects of earlier childhood experiences on later child outcomes, as they allow for controlling for children's later experiences. These models include repeated measures of variables at different time points; in this study, child functioning measured at age 2, 3, 4, 5 and 7.5, and parenting measured at age 2-3 and age 5. The simultaneous inclusion of parenting measured at two time points examined the independent contribution of parenting during the toddler years whilst controlling for parenting at early school age. The autoregressive aspect of the models represents the continuity of measures, that is, how previous child functioning (externalising and internalising) predicts later functioning, and how earlier parenting ('warmth' and 'effective management') predict these later parenting constructs. The cross-lagged part of the model is the association between parenting and later child externalising and internalising behaviour. In other words, these models examined the relationship between parenting and child functioning, whilst controlling for the effect of previous levels of child functioning, and also controlling for any previous relationship between parenting and child variables (Geiser, 2012). Also control variables were included in these models and these were modelled on all of the repeated parenting and child behavioural measures at each time point.

A feature of autoregressive models is that indirect effects can be easily modelled. These are also referred to as mediator or intervening variables that carry effects. In this study it was examined to what extent longitudinal effects of early parenting are mediated by later parenting, and if there are longitudinal effects that are mediated by earlier effect of parenting on child functioning that carry on affecting later child functioning. The Delta method, which is the MPlus default, was used for estimating indirect effects.

Autoregressive cross-lagged models have the advantage of enabling the examination of reciprocal effects. Because of the possibility of a bidirectional or transactional relationship between parenting and child functioning (Bell, 1968; Sameroff, 1975), the current study carried out additional analyses that examined child externalising and internalising behaviours as predictors of parenting behaviours. This was examined in modified models that were more appropriate for studying bidirectional effects than those examining the main aspects of questions 5 to 7. In these models it was important to ensure that the time lag of one direction was equivalent to the lag of the other direction. Therefore, bidirectional effects were explored in autoregressive cross-lagged models with three repeated measure of parenting, at age 2, 3 and 5, and with measures of child conduct and emotional outcomes that were concurrent with these time points. Two-way cross-lagged paths between parenting and child domains were modelled that tested child behaviour as a predictor of parenting whilst also testing parenting as a predictor of child functioning.

Autoregressive models with latent variables are based on the assumption of factorial invariance, also referred to as measurement invariance or measurement equivalence. This means that a measure at one time point should be equivalent to the same measure repeated at another time point. For latent variables made up of manifest indicators, it is the assumption that the respective indicators represent the same underlying construct over time (Selig & Little, 2012). There are several levels of factorial invariance, each one applying gradually more stringent requirements (Little et al., 2007). The first level allows correlation between errors or residuals of manifest indicators across each time points. The second level involves loading invariance, which refers to the loading of the indicators of the latent variables being equal at each time point. These two levels are the minimum expectation in models that examine covariance structures, which is the case in the current study. In models that examine mean structures, such as latent growth models, intercept invariance is also required. The

fourth level of factorial invariance is residual invariance, which is strict factorial invariance, although this is rarely enforced because it is not realistic in most models. Therefore, only the first two levels of factorial invariance were applied when specifying the autoregressive models for this study. This was done by including correlations between corresponding indicators at each time point, and by fixing loadings of corresponding indicators to be equal at each time point. As in all other SEM models, one indicator of each latent variable was fixed in order to scale and identify variables as explained above. See Figures 3.5, 3.6 and 3.7 below illustrating these model specifications.

3.5.3.5. Estimators

In the SEM analyses in this study, the estimators used were the Robust Maximum Likelihood (MLR) and the Weighted Least Squares with Mean and Variance adjustment (WLSMV). The MLR estimator is recommended when indicators are continuous variables, as is the case for the latent measure of effective management, and the robust version of the ML estimator adjusts for any non-normality in the data. For latent variables where one or more of the indicators are binary or ordered categorical, it is recommended to use the WLSMV estimator (Muthén & Muthén, 2012b). In the current study, three of the indicators measuring warmth were binary and these analyses therefore used the WLSMW. In models that included both warmth and effective management, this estimator was also used in order to accommodate the binary indicators. This was with exception of the interaction models where it was not possible to use the WLSMV estimator because these methods have not yet been developed for MPlus, and therefore the MLR estimator had to be employed. CFAs were carried out with both the MLR and the WLSMV estimator in order to examine measurement models with both of these.

3.5.3.6. Assessment of model fit

With regards to assessing results of CFA and SEM analyses, models are evaluated in terms of how well the estimated parameters fit the observed data, and the objective is therefore to reproduce a model that is as identical as possible to the input data in the analysed matrix. It is convention to report multiple model fit statistics as a way of triangulating results. Model fit, or "goodness of fit" as it is commonly referred to, was evaluated by several fit statistics or indices generated in Mplus. These were: 1] Root mean square error of approximation (RMSEA); 2] Comparative fit index (CFI); 3] Tucker-Lewis index (TLI); 4] Standardized root mean square residual (SRMR), used with the ML or MLR estimator for continuous indicators; and 5] Weighted root mean square residual (WRMR), used with the WLSMW estimator for analysis of latent variables that include ordered categorical or binary indicators. Each fit index has a recommended cut-off point (Table 3.2). RMSEA values below .05 indicate a good fit, values between .05-.10 are considered an acceptable fit, and values above .10 signify a poor fit (Browne & Cudeck, 1993; McDonald & Ho, 2002). For both CFI and TLI, an acceptable fit is between .90 and .94, and .95 and above signifies a good fit. For SRMR a value below .08 is considered a good fit (Hu & Bentler, 1999), and for WRMR a value less than .90 is recommended (Muthén & Muthén, 2012b). Although the Chi-square is a widely used model fit statistic in SEM, it is less useful in large samples (N > 200) because of the increase in statistical power leading to most results being statistically significant. As the current study had a large sample size of over 700, the chi-square was not used to assess goodness of model fit.

Table 3.2: Fit indices and thresholds for evaluating model fit in SEM

Fit index	Values indicating a good fit
Root mean square of approximation (RMSEA)	<.05
Comparative fit index (CFI)	>.95
Tucker-Lewis index (TLI)	>.95
Standardised root mean square residual (SRMR)	<.08
Weighted root mean square residual (WRMR)	<.90

3.5.3.7. Assessment of individual parameters

In terms of assessing the association between parenting and child outcomes the standardised coefficients (β) is reported. Also the coefficient of determination (R^2) is reported in models, which signifies the proportion of variance in an outcome that is explained by the predictor variables overall.

3.5.3.8. Sample size in SEM

With regards to sample size requirements in SEM, Kline (2011) considers fewer than 100 as a small sample, 100 to 200 as a medium, and over 200 as a large sample. The current dataset with a sample size of (N=731) is therefore fairly large, and even taking into consideration attrition over time it has sufficient statistical power to detect even small effects. Another measure of sample adequacy is the ratio of available cases to number of parameters in the model to be estimated. Whilst Kline (2011) proposes that a ratio of 20:1 is desirable, Tanaka (1987) suggest that 5:1 is sufficient. The ratio of available observations to free parameters is reported for all models in this study.

3.5.3.9. Hypothesised SEM models

Figures 3.1.1 to 3.7 below illustrate the hypothesised structural equation models for each of the seven research question of this study. As is conventional in SEM, circles represent latent variables (parenting) and rectangles are manifest or measured variables (child outcomes and covariates). The zig zag lines from the latent parenting variables to a third variable signifies that this variable is an interaction between these latent variables (Bollen & Paxton, 1998). Structural paths of interest are in bold. In many of the models (research questions 1-4), child externalising and internalising problems were examined simultaneously, and because of the high level of correlation between these outcomes they were specified to be correlated. As

outlined previously, a number of covariates were included to control for factors other than parenting that might be predictive of child behavioural and emotional outcomes (child problems at baseline, intervention status, child gender, parent race, family income, parent education, parent depression, and parent age). Because some of these variables may be mediated through parenting, this is reflected in the hypothesised models by modelling covariates as predictors of both parenting and child outcomes.

Research questions 1 to 4 form the first part of this study and focus on the predictive effects of early parenting (age 2-3) associated with attachment theory (warmth) and parenting related to social learning theory (effective management). First, in questions 1 and 2, the two theoretical parenting constructs 'warmth' and 'effective management' were examined in separate models in order to assess their prediction of child externalising internalising problems, whilst also controlling for a number of relevant covariates. Then in question 3, both parenting constructs were examined together, which allowed an examination of the unique relationship to child functioning of each parenting dimension, whilst covariates and the other parenting variable were controlled for. Furthermore, in questions 3 and 4, effects of concurrent and longitudinal interactions between parenting dimensions were tested. The relationship between parenting and child functioning were examined in two ways. First, a series of structural equation models (SEMs) examined the association between parenting and child functioning at each measurement point for externalising and internalising, at age 3, 4, 5 and 7.5. Then, latent growth curve models (LGCMs) examined parenting as predictors of trajectories of child externalising and internalising behaviour from age 3 to age 7.5. No growth models were carried out for question 4 for the reason that there were only two measurement points available for externalising and internalising, and as a minimum of three points are required for LGCM.

In research questions 5 to 7, which is the second part of this study, earlier and later parenting are studied together in autoregressive cross-lagged models in order to investigate any enduring effects of early parenting over later parenting. Because parenting at the two measurement points (age 2-3 and age 5) were modelled simultaneously, along with repeated measures of child functioning at age 3, 4, 5 and 7.5, this allowed an examination of temporal aspects of the relationship between theoretical parenting constructs and child functioning, and it also allowed the study of short-term and long-term effects on child adjustment of parenting dimensions. Indirect effects between early parenting and later child outcomes were specified in order to examine how any effects of earlier parenting reach later child outcomes.

Question 1: Does early parental warmth (age 2-3) predict child externalising and internalising behaviour at age 3, 4, 5 and 7.5?

Figure 3.1.1: SEM model for research question 1

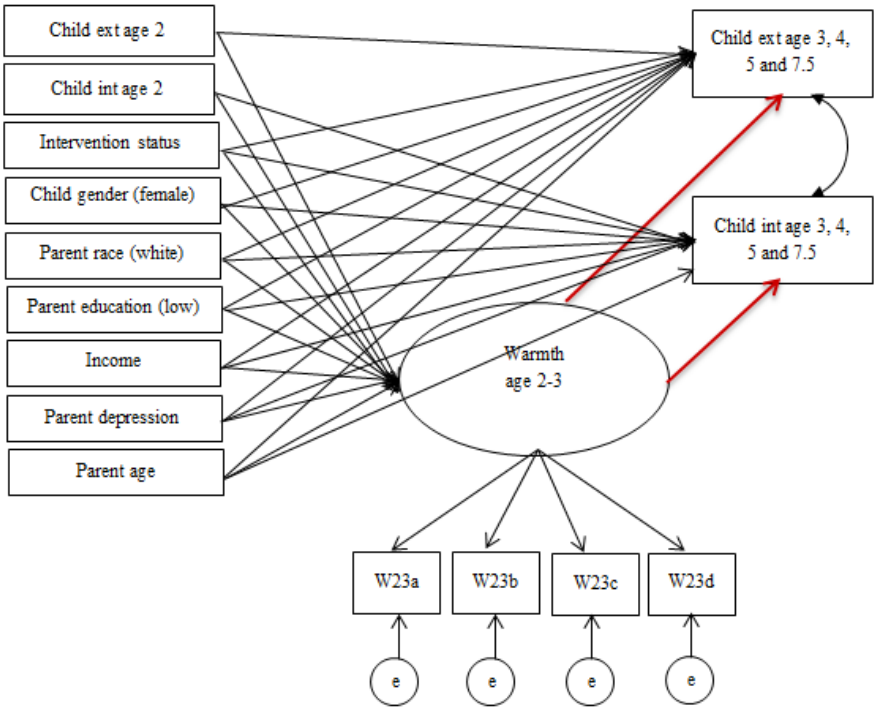
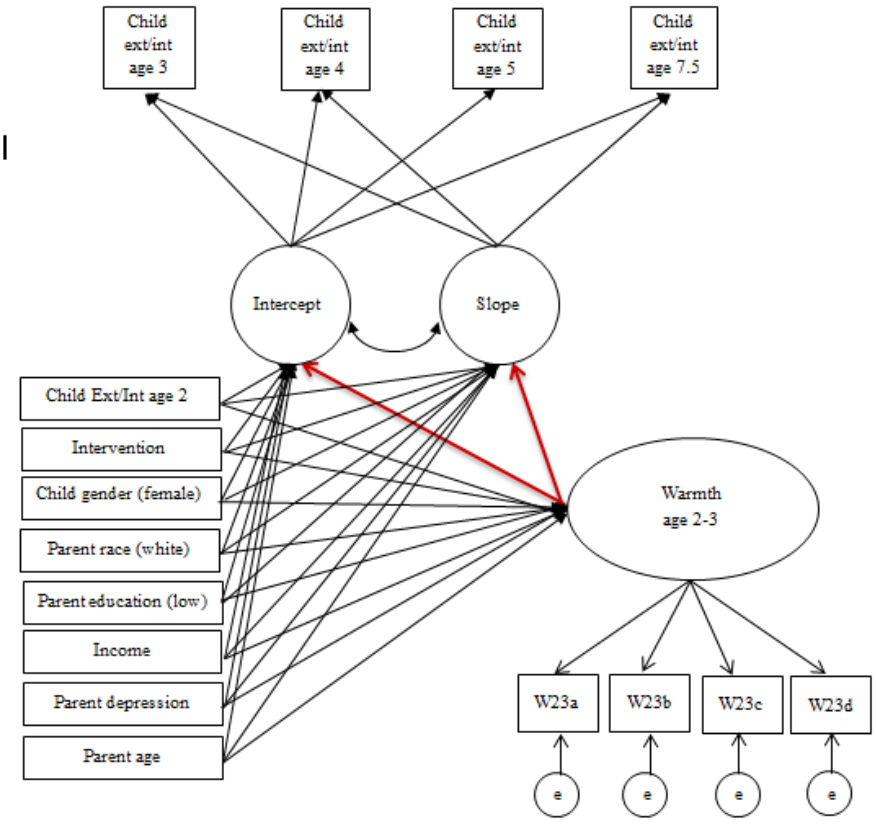


Figure 3.1.2: LCGM model for research question 1



Question 2: Does early parental effective management (age 2-3) predict child externalising and internalising behaviour at age 3, 4, 5 and 7.5?

Figure 3.2.1: SEM model for research question 2

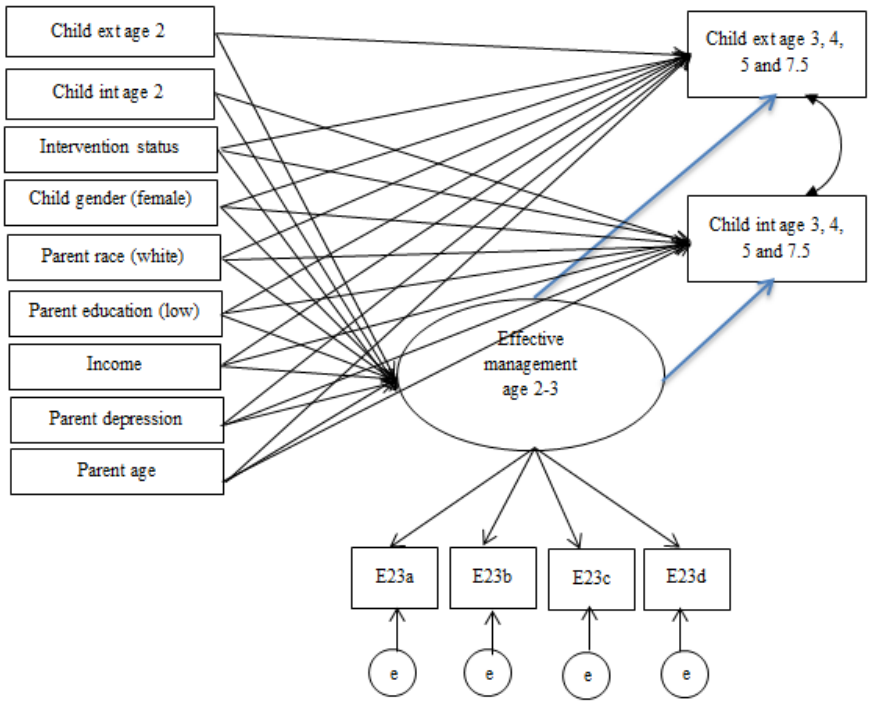
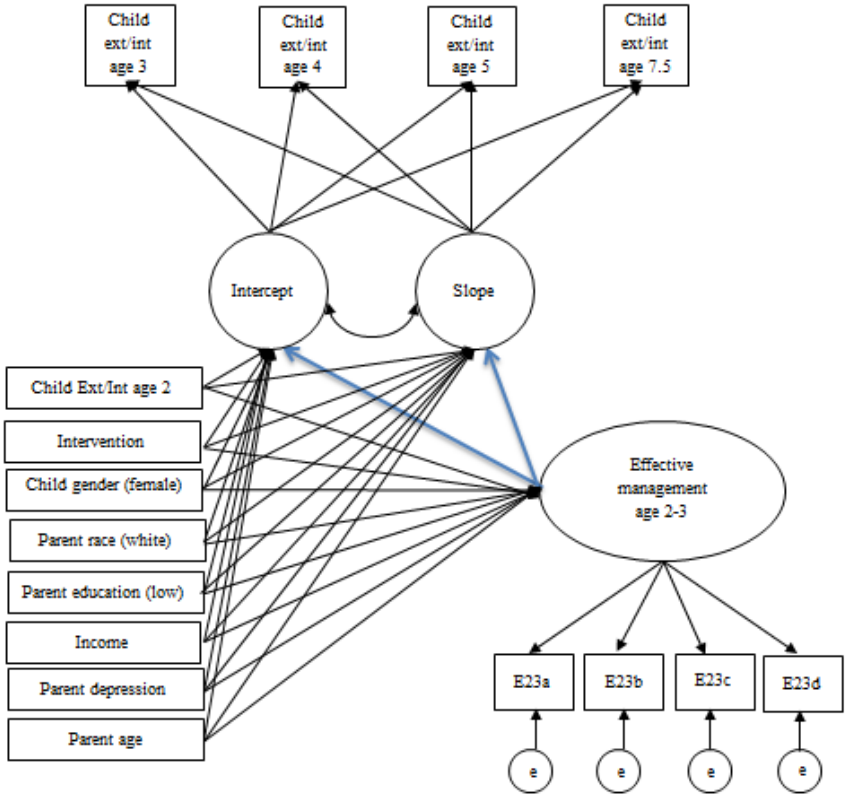


Figure 3.2.2: LGCM model for research question 2



Question 3: Do both early parental warmth and early effective management (age 2-3) predict child externalising and internalising behaviour at age 3, 4, 5 and 7.5, and do these parenting dimensions interact over and above their additive effects in predicting these child outcomes?

Figure 3.3.1: SEM model for research question 3

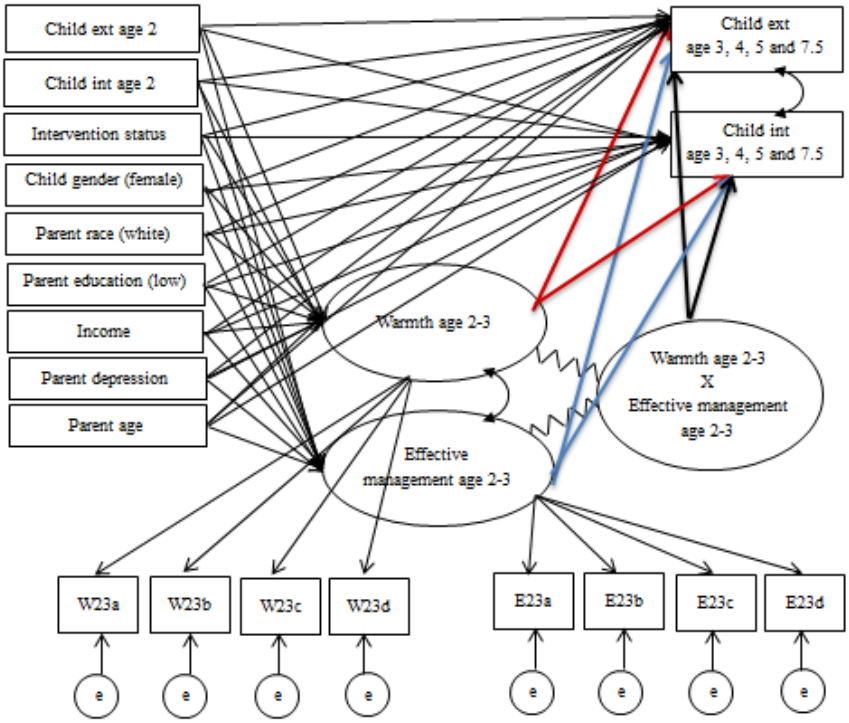
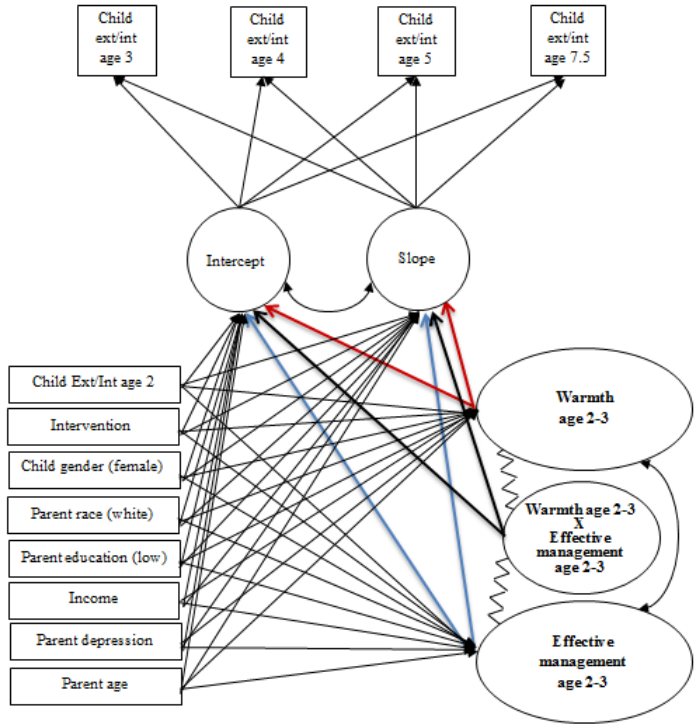


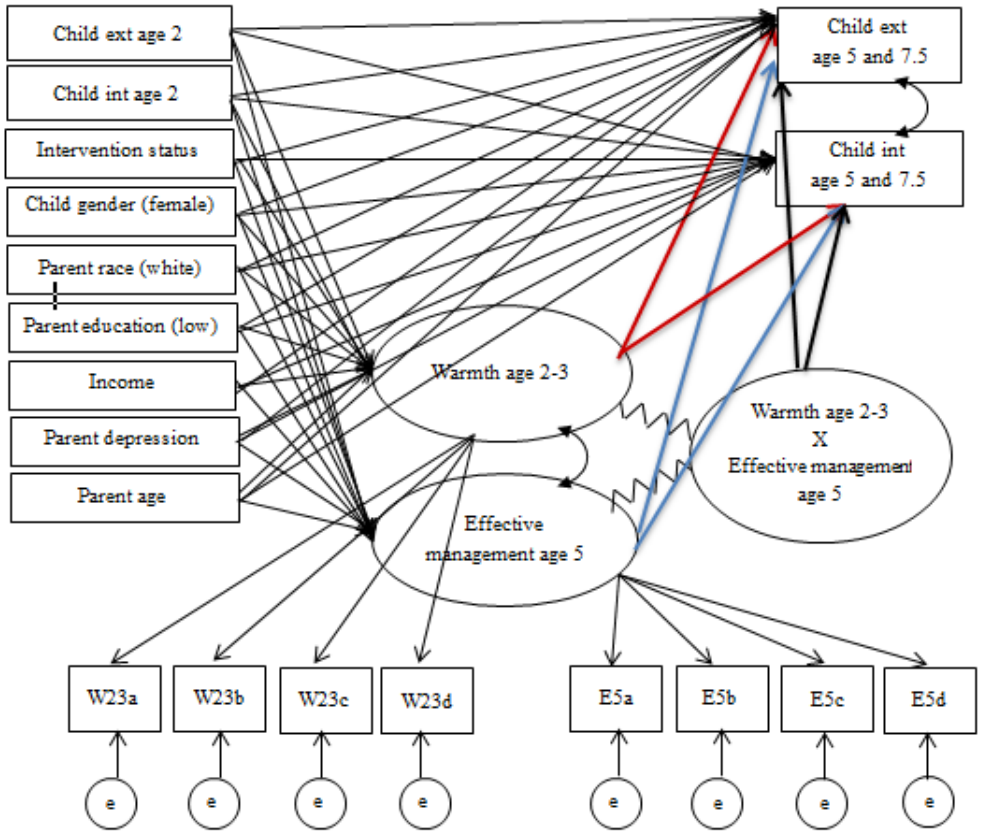
Figure 3.3.2: LGCM model for research question 3



Notes: Indicators for the latent parenting variables 'warmth' and 'effective management' are not shown.

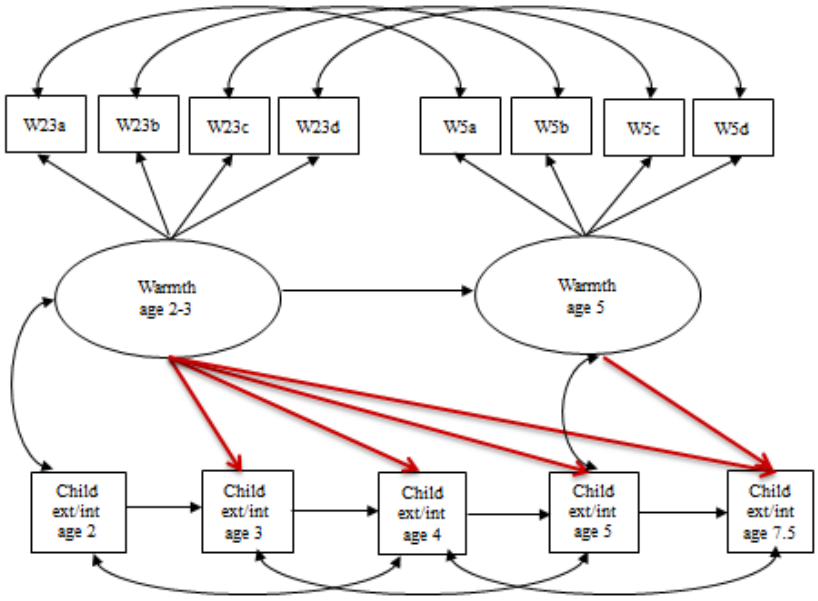
Question 4: Do early parental warmth (age 2-3) and later effective management (age 5) predict child externalising and internalising behaviour at age 5 and 7.5, and do these parenting dimensions interact over and above their additive effects in predicting these child outcomes?

Figure 3.4: SEM model for research question 4



Question 5: Does early parental warmth (age 2-3) predict child conduct and emotional problems at age 5 and 7.5 when more concurrent parenting at age 5 is controlled for?

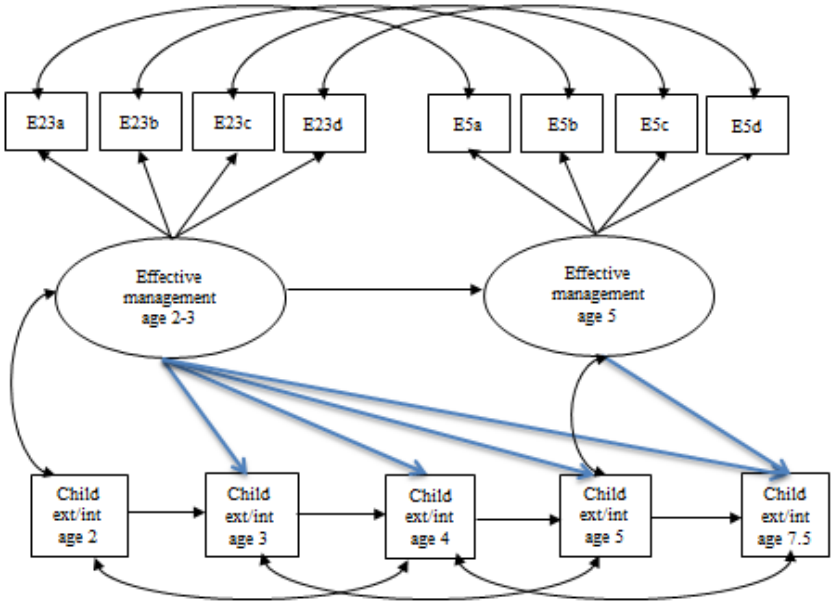
Figure 3.5: SEM model for research question 5



Notes: Covariates are intervention status, child gender, parent race, parent education, income, maternal depression, and maternal age.

Question 6: Does early parental effective management (age 2-3) predict child conduct and emotional problems at age 5 and 7.5 when more concurrent parenting at age 5 is controlled for?

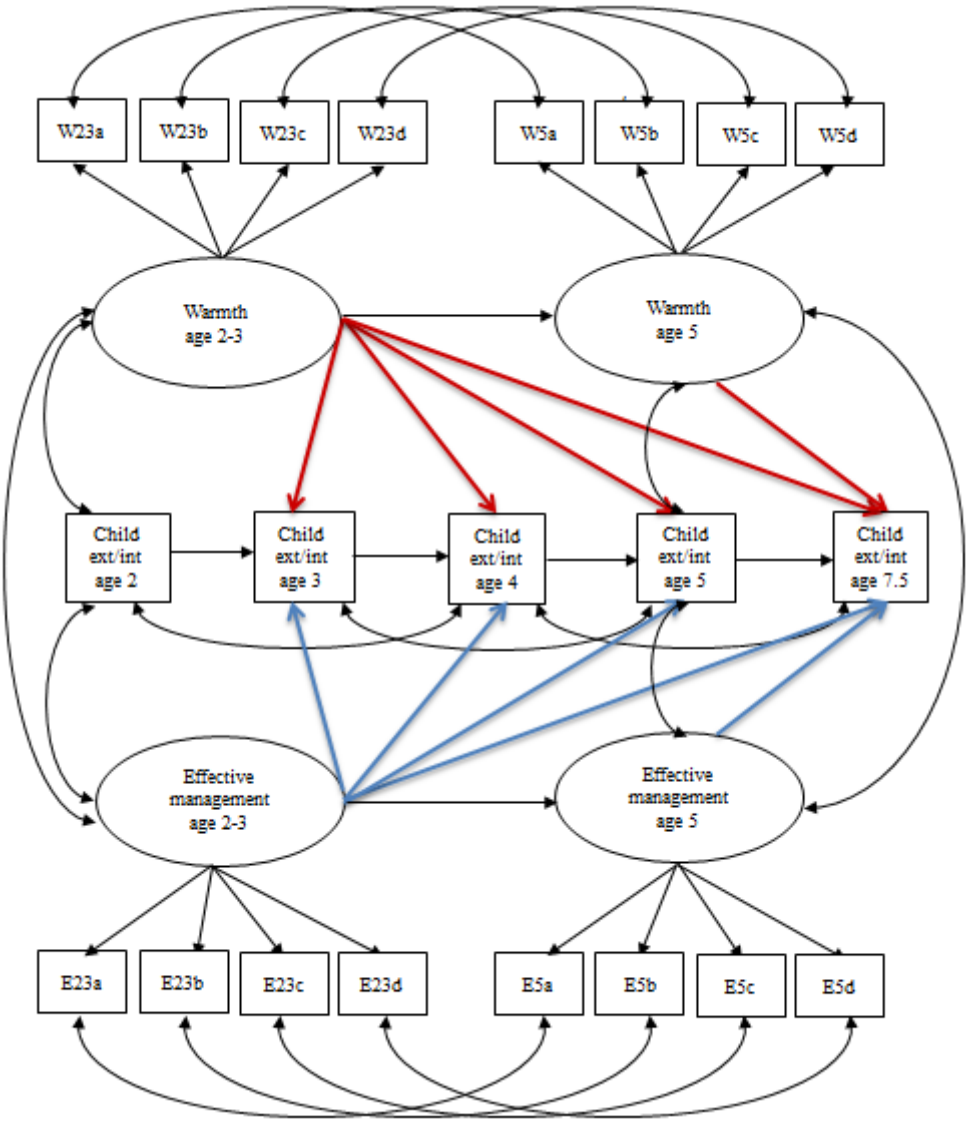
Figure 3.6: SEM model for research question 6



Notes: Covariates are intervention status, child gender, parent race, parent education, income, maternal depression, and maternal age.

Question 7: Do early parental warmth and early effective management (age 2-3) predict child conduct and emotional problems at age 5 and 7.5 when parenting at age 5 is controlled for?

Figure 3.7: SEM model for research question 7



Notes: Covariates are intervention status, child gender, parent race, parent education, income, maternal depression, and maternal age.

3.6. Research ethics

The original study was granted ethical approval to each of the research sites by the US Institutional Review Board (IRB), which approves behavioural research involving humans. Primary caregivers gave informed consent prior to each of the assessments, and were also paid for their time and participation after each of these. Those taking part in the intervention aspect received a gift voucher after each session. The dataset used in the current study was anonymised and therefore did not contain any data on personal identifiers that could be traced back to participants. The dataset is stored safely on a password protected computer to which only the doctoral researcher has access. For the current study, a CUREC/1 research ethics form was submitted to the Central University Research Ethics Committee (CUREC) at University of Oxford, but a full ethical application (CUREC/2 form) was not required due to the study using secondary anonymised data.

CHAPTER 4: Results of preliminary analysis

This chapter reports the results of descriptive and preliminary analysis of the study. First, the study sample is described in term of demographic and socioeconomic background characteristics of children and parents. Then results of exploratory and confirmatory factor analysis of parenting variables are reported. The suitability of unconditional latent growth curve models for use in subsequent conditional prediction models is assessed. Also longitudinal autoregressive measurement models are examined. Descriptives of all study variables and their zero-order bivariate correlations are reported. Other analyses include the examination of the relationship between the observed global parenting measures used in this study and the micro-coded measure of positive parenting that was not utilised. Finally the appropriateness of using both the control and the intervention group for examining developmental questions posed in this study is tested.

4.1. Sample characteristics

Sample characteristics of the 731 study participants at the first child assessment point (child age 2 years) are shown in Table 4.0 below. In terms of baseline demographics and characteristics of children, 51% were boys and the average age was 29.9 months (range 22-37 months). Racial composition of children was 50% White, 28% Black/African American, 13% Mixed race, and 8% were of other origin. Many children presented high levels of behavioural and emotional problems as indicated on the Child Behaviour Checklist (CBCL; Achenbach & Rescorla, 2000), with 29% of children having externalising problems and 19% internalising symptoms within a clinical range.

As for children's primary caregivers, the vast majority were female (98%) and most were the study child's biological parent (95%). The average age of parents at the first

assessment was 26.9 years. White parents made up 58% of the sample, 28% were Black/African American, and 4 % were mixed race. In terms of parents' educational qualifications, 24% had less than high school education, 41% had completed high school, 33% had up to 2 years of education or training beyond high school, and 3% had a college degree. As for family structure, 52% of caregivers were living with the child's other biological parent, 8% were single but cohabiting with a partner, and 40% were not living with a partner. The average household size was 4.5 members, and 71% lived in rented accommodation. Nearly 80% of families were living below the poverty line. Many primary caregivers experienced depressive symptoms with 45% scoring in the clinical range on the Center for Epidemiologic Studies Depression Scale (CES-D; Radloff, 1977).

Table 4.0: Sample characteristics (age 2 assessment)

	Sample size	**Mean or %**
Child age	731	29.9 months (range 22-37; s.d.=3.2)
Child gender	731	51% male
Child race	731	50% White 28% Black/African American 13% Mixed race 8% Other
Parent age	725	26.9 years (range 16-69; s.d.= 6.51)
Parent gender	730	98% Female
Parent race	730	58% White 28% Black/African American 4% Mixed race 9% Other
Parent relationship to child	706	95% Biological parent
Parent education	731	24% Less than high school 41% High school 33% Two years education or training beyond high school 3% College graduate
Family structure	730	52% Living with child's other biological parent 40% Not living with a partner 8% Cohabiting with partner
Household income (yearly)	729	66% Below $20,000
Below poverty line	729	80%
Housing	729	71% Rented home 16% Own home 9% Live with a relative 4% Other
Household size	731	4.5 People (s.d. = 1.63)
Parent clinically depressed	729	45%
Child clinical externalising	730	29%
Child clinical internalising	730	19%

4.2. Exploratory and confirmatory factor analysis of parenting measures

In this study, the measure 'warmth' represents attachment related parenting and 'effective management' is the measure of parenting associated with social learning. Both parenting measures are latent variables, measured by several indicators from the global assessment tools the Home Observation for Measurement of the Environment (HOME; Bradley & Caldwell, 1979; Bradley et al., 2001) and the Coder Impressions Inventory (COIMP; Dishion et al., 2004). Therefore, before carrying out any structural equation modelling analyses that address the main questions of the study, it was important to factor analyse the items making up the latent measures to be used in these analyses. First, exploratory factor analysis (EFA) examined how parenting items loaded onto factors and how many factors were identified. Then, confirmatory factor analysis (CFA) inspected how well the items measured each of the identified factors and their suitability for use in further structural equation models. In the following sections the results of these analytical procedures are reported.

4.2.1. Parenting items and their correlations

Parenting items are shown Table 4.0.1 below. Correlations between items are presented in Tables 4.0.2 and 4.0.3. Correlations between items relating to 'warmth' ranged between r= .38 ($p<.001$) and r= .54 ($p<.001$) at age 2-3, and at age 5 between r= .26 ($p<.001$) and r= .49 ($p<.001$). Correlations between items making up 'effective management' were between r=.52 ($p<.001$) and r=.65 ($p<.001$) at age 2-3, and between r=.46 ($p<.001$) and r=.64 ($p<.001$) at age 5.

Table 4.0.1: Variable names and items in factor analysis

Parenting construct	Observed variables / Indicators	Variable name		Response
		Age 2-3	Age 5	
'warmth' (Home visitor observed, HOME)	Parent's voice conveys positive feelings toward child	W23a	W5a	Binary
	Parent caresses or kisses child at least once during visit	W23b	W5b	Binary
	Parent responds positively to praise offered by visitor to child	W23c	W5c	Binary
	Parent attempts to be warm and friendly	W23d	W5d	Scale (5 point Likert)
'effective management' (Video coder observed, COIMP)	Parent uses directives that are specific and clear to child	E23a	E5a	Scale (9 point Likert)
	Parent sets limits firmly without using aversive control	E23b	E5b	Scale (9 point Likert)
	Parent is appropriately consistent in responding to positive and negative child behaviour	E23c	E5c	Scale (9 point Likert)
	Parent seems in control/leadership of the child during session	E23d	E5d	Scale (9 point Likert)

Table 4.0.2: Correlations between parenting items age 2-3

	W23a	W23b	W23c	W23d	E23a	E23b	E23c	E23d
W23a								
W23b	0.38***							
W23c	0.43***	0.42***						
W23d	0.54***	0.43***	0.53***					
E23a	0.26***	0.26***	0.29***	0.29***				
E23b	0.29***	0.22***	0.24***	0.27***	0.56***			
E23c	0.29***	0.26***	0.30***	0.35***	0.61***	0.59***		
E23d	0.17***	0.14**	0.14**	0.18***	0.54***	0.52***	0.65***	

*p<.05, ** p<.01, ***p<.001
See table 4.0.1 for item wording

Table 4.0.3: Correlations between parenting items age 5

	W5a	W5b	W5c	W5d	E5a	E5b	E5c	E5d
W5a								
W5b	0.26***							
W5c	0.42***	0.31***						
W5d	0.49***	0.34***	0.47***					
E5a	0.21***	0.21***	0.18***	0.26***				
E5b	0.20***	0.15***	0.11**	0.21***	0.46***			
E5c	0.23***	0.15***	0.16***	0.25***	0.62***	0.56***		
E5d	0.14***	0.18***	0.08*	0.18***	0.64***	0.52***	0.62***	

*p<.05, ** p<.01, ***p<.001
See table 4.0.1 for item wording

4.2.2. Exploratory factor analysis (EFA)

As detailed in the methods chapter it was decided to use items from the HOME (Bradley & Caldwell, 1979; Bradley et al., 2001) for measuring parental warmth, and items from the COIMP (Dishion et al., 2004) to measure parental effective managment. There were 6 HOME items that seemed to represent parental warmth, and 6 COIMP items appeared related to parent effective management. These items were then analysed in exploratory factor analysis (EFA) in order to establish the number of factors and any cross loading. Results showed that items loaded onto the two factors 'warmth' and 'effective management', although there was cross loading of some items. Two items related to effective management, and two items related to warmth, loaded onto both parenting factors. Upon inspection it seemed that the cross-loading items were somewhat ambiguous in terms of which theoretical aspects of parenting they were related to. For example, one of these items was 'parent seems mindful of child behaviour, whereabouts, activities and feelings'. This item relates to parental monitoring of the child, which is associated with social learning. However, because it also entails monitoring of the child's feelings, it crosses over to the domain of attachment theory. All items that cross-loaded were excluded from the parenting measures in order to create two more theoretically 'pure' constructs, which would enable a better comparison of parenting dimensions.

The final parenting measures 'warmth' and 'effective management' each had 4 items. Results of EFA of all 8 parenting items showed that the pattern matrix and the structure matrix for items formed two distinct factors or latent variables, both at age 2-3 and at age 5 (Tables 4.0.4 and 4.0.5). The two parenting factors were modestly correlated at age 2-3 ($r=.35$, $p<.001$) and at age 5 ($r=.29$, $p<.001$). Note that these are correlations of observed or manifest parenting constructs, whereas latent correlations are obtained in confirmatory factor analysis reported further below. The reliability or internal consistency of parenting measures

(Table 4.0.6) showed that, at both assessment points, both constructs demonstrated acceptable or good internal consistency with Cronbach's Alpha levels of α = .76 and α = .61 for 'warmth', and α = .84 and α = .83 for 'effective management', at age 2-3 and age 5 respectively.

Table 4.0.4: Results of exploratory factor analyses for age 2-3 parenting

Pattern Matrix		
	Component	
	1	2
E23d	.893	
E23c	.837	
E23b	.784	
E23a	.779	
W23d		.806
W23a		.775
W23c		.759
W23b		.706

Structure Matrix		
	Component	
	1	2
E23c	.864	
E23d	.840	
E23a	.808	
E23b	.799	
W23d		.814
W23a		.778
W23c		.760
W23b		.701

Component Correlation Matrix		
Component	1	2
1	1.00	.35
2	.35	1.00

Table 4.0.5: Results of exploratory factor analyses for age 5 parenting

Pattern Matrix		
	Component	
	1	2
E5d	.882	
E5c	.844	
E5a	.806	
E5b	.754	
W5c		.803
W5d		.790
W5a		.760
W5b		.579

Structure Matrix		
	Component	
	1	2
E5d	.864	
E5c	.840	
E5a	.808	
E5b	.799	
W5d		.802
W5c		.776
W5a		.761
W5b		.595

Component Correlation Matrix		
Component	1	2
1	1.00	.29
2	.29	1.00

Table 4.0.6: Reliability of parenting constructs and construct correlations

Parenting construct	**Age 2-3**	**Age 5**
'Warmth' (4 items)	α = .76	α = .61
'Effective management' (4 items)	α = .84	α = .83
Correlation	r = .35	r = .29

4.2.3. Confirmatory factor analysis (CFA)

Because both the MLR and the WLSMV estimator were used in analyses in this study, confirmatory factor analysis (CFA) was carried out using both estimators. Results of the CFAs for age 2-3 parenting are shown below in Figure 4.0.1a and Table 4.0.7a (WLSMV estimator), and in Figure 4.0.1b and in Table 4.0.7b (MLR estimator). For age 5 parenting these are in Figure 4.0.2a and Table 4.0.8a (WLSMV estimator), and in Figure 4.0.2b and Table 4.0.8b (MLR estimator). Note that there are no residual errors for binary items in analyses with the WLSMV estimator, which is why these are not reported in the figures and tables.

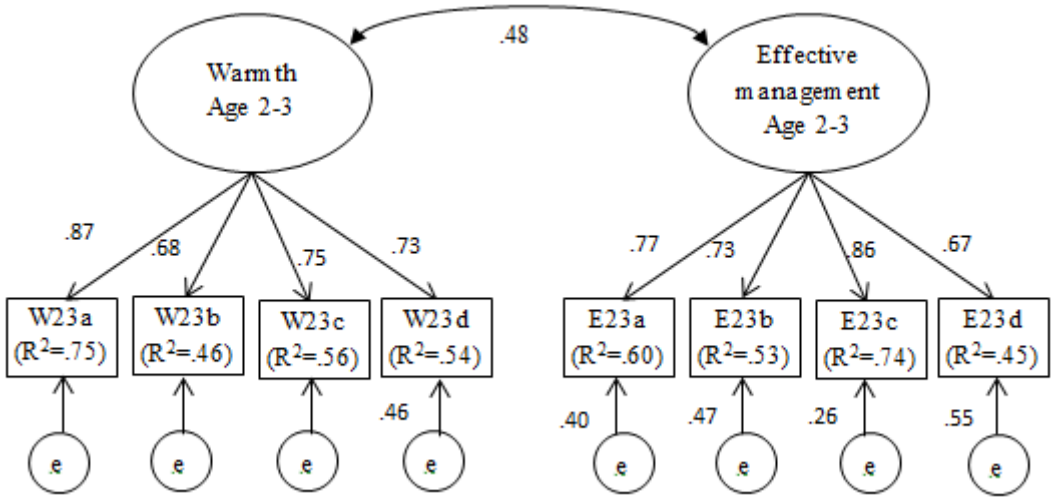
Overall, standardised factor loadings of indictors on the latent variable were acceptable for both parenting constructs at both measurement points (.40 is considered a cut-off point; Bowen & Guo, 2012). For 'warmth', loadings at age 2-3 ranged between .68-.87 (WLSMV estimator) and .58-.78 (MLR estimator), and at age 5 between .66-.91 (WLSMV estimator) and .45-.75 (MLR estimator). For 'effective management' at age 2-3, factors loading ranges were .67-.86 (WLSMV estimator) and .71-.85 (MLR estimator), and at age 5 ranges were .65-.82 (WLSMV estimator) and .65-.81 (MLR estimator). The key difference between results using the MLR and the WLSMV estimator is that loadings for warmth were lower with the MLR as this estimator does not take into account the binary nature of indicators. This means that the measure of warmth using the MLR, which was employed in interaction models where the WLSMV estimator could not be used, was not as 'good' a measure as that using the WLSMV. Therefore estimates of the relationship between warmth and child outcomes may be more conservative in interaction models. This is has to be considered when interpreting results. However, loadings are still acceptable and the warmth measure is therefore suitable in models where the WLSMV cannot be used.

Related to the magnitude of factor loadings is the proportion of variance in each indicator that is explained by the latent factor. This is the squared multiple correlation (SMC), reported as R^2 in MPlus. Values are shown in Figures 4.0.1a and 4.0.1b for parenting at age 2-3, and in Figures 4.0.2a and 4.0.2b for parenting at age 5. These show moderate to large values for items related to warmth (age 2-3: WLSMV range R^2= .46-.75, MLR range R^2= .33-.62; age 5: WLSMV range R^2= .42-.66, MLR range R^2= .21-.56), and for effective management items (age 2-3: WLSMV range R^2= .45-.74, MLR range R^2= .50-.72; age 5: WLSMV range R^2= .42-.66, MLR range R^2= .42-.65). Therefore both latent constructs predicted their manifest items reasonably well, although it is noticeable that for parental warmth the WLSMV estimator provided a better measure as noted above.

Results of CFA also showed that the two theoretical parenting constructs were correlated at age 2-3 (r=.48 with both estimators) and at age 5 (r=.42 WLSMV, r=.37 MLR). These are latent correlations, and because they are without measurement error they are larger than the manifest correlations reported in the exploratory factor analysis reported above.

In CFA models for parenting at age 2-3 and at age 5, for both estimators, fit indices indicated that the models fitted the data well (RMSEA <.05; CFI and TLC >.95; SRMR <.08, WRMR <.90). No post modifications to the measurement models were carried out because of the very good of fit of the initial models. These measurement models were therefore suitable for use in further SEM analyses addressing the substantive research questions of this study that investigate to what extent the parenting constructs are associated with children's emotional and behavioural functioning. Results of these analyses are presented in the subsequent chapter of this thesis.

Figure 4.0.1a: Result of CFA of parenting constructs age 2-3 (WLSMV estimator)



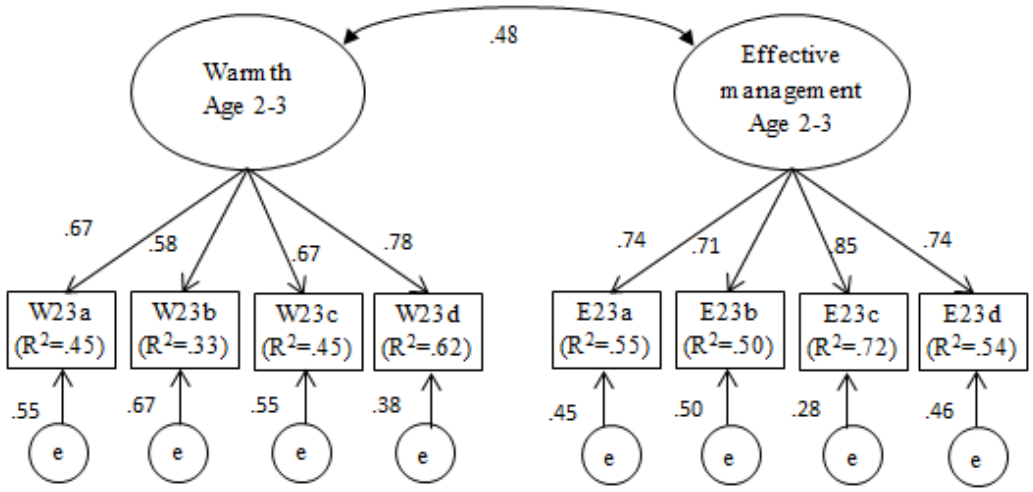
Model fit: RMSEA = .032, CFI = .99, TLI = .98, WRMR = .59

Notes: Residual error estimates for binary indicators are not available when using the WLSMV estimator.

Table 4.0.7a: Standardised and unstandardised coefficients and variance explained in CFA of parenting age 2-3 (WLSMV estimator)

Parenting construct	Indicator name	β	B	S.E.	Variance in indicator explained by construct (R^2)	Residual variance of indicator (e)
'warmth'	**W23a**	0.87	1.00	0.00	.75	*
	W23b	0.68	0.78	0.05	.46	*
	W23c	0.75	0.86	0.05	.56	*
	W23d	0.73	0.69	0.05	.54	.46
'effective management'	**E23a**	0.77	1.00	0.00	.60	.40
	E23b	0.73	1.31	0.08	.53	.47
	E23c	0.86	1.45	0.09	.74	.26
	E23d	0.67	1.18	0.08	.45	.55
**Notes: ***Residual error estimates are not available for binary items when using the WLSMV estimator						

Figure 4.0.1b: Result of CFA of parenting constructs age 2-3 (MLR estimator)

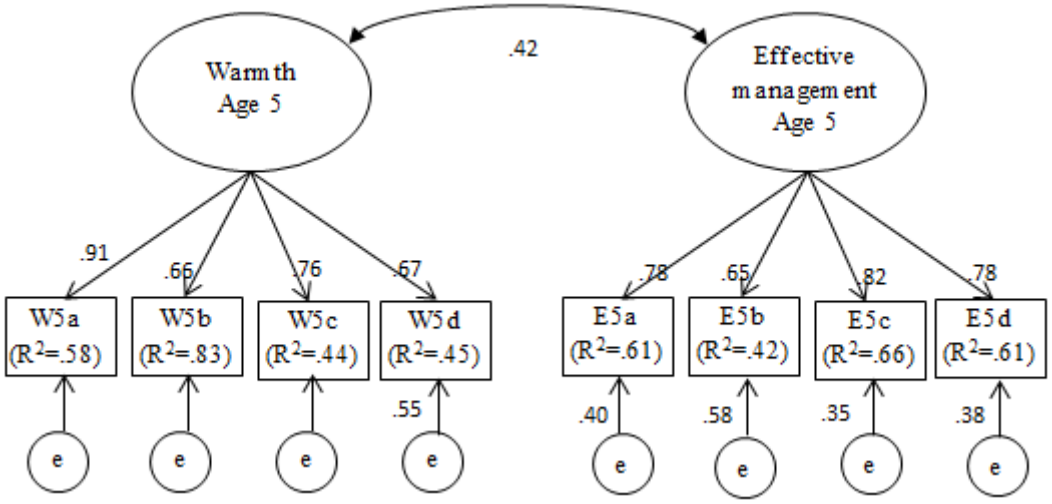


Model fit: RMSEA = .041, CFI = .99, TLI = .98, SRMR = .032

Table 4.0.7b: Standardised and unstandardised coefficients and variance explained in CFA of parenting age 2-3 (MLR estimator)

Parenting construct	Indicator name	β	B	S.E.	Variance in indicator explained by construct (R^2)	Residual variance of indicator (e)
'warmth'	**W23a**	0.67	1.00	0.00	.45	.55
	W23b	0.58	1.39	0.14	.33	.67
	W23c	0.67	1.45	0.13	.45	.55
	W23d	0.78	2.06	0.16	.62	.38
'effective management'	**E23a**	0.74	1.00	0.00	.55	.45
	E23b	0.71	1.33	0.08	.50	.50
	E23c	0.85	1.49	0.09	.72	.28
	E23d	0.74	1.35	0.09	.54	.46

Figure 4.0.2a: Result of CFA of parenting constructs age 5 (WLSMV estimator)

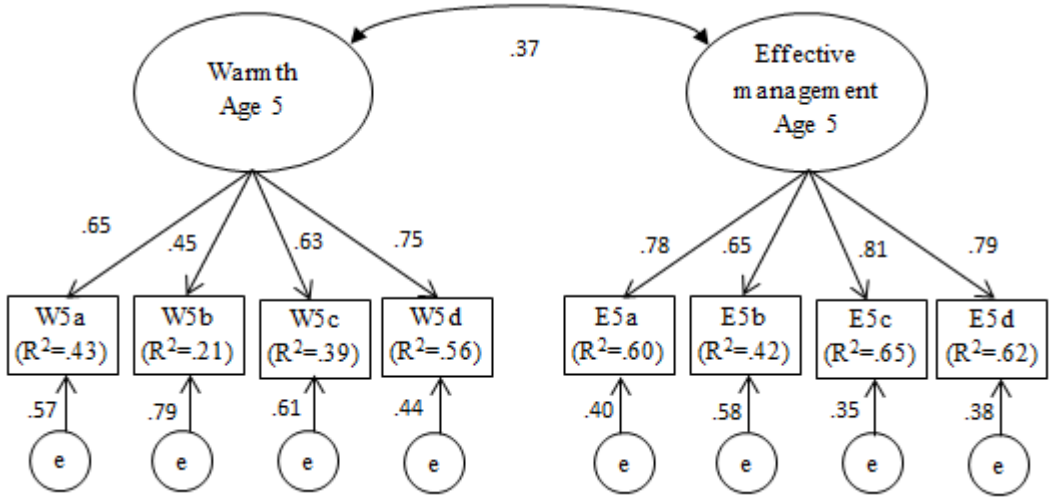


Model fit: RMSEA = .035, CFI = .99, TLI = .98, WRMR = .65

Table 4.0.8a: Standardised and unstandardised coefficients and variance explained in CFA of parenting constructs age 5 (WLSMV estimator)

Parenting construct	**Indicator name**	**β**	**B**	**S.E.**	**Variance in indicator explained by construct (R^2)**	**Residual variance of indicator (e)**
'warmth'	**W5a**	0.91	1.00	0.00	.58	*
	W5b	0.66	0.73	0.08	.83	*
	W5c	0.76	0.84	0.08	.44	*
	W5d	0.67	0.75	0.07	.45	.55
'effective management'	**E5a**	0.78	1.00	0.00	.61	.39
	E5b	0.65	1.25	0.07	.42	.58
	E5c	0.82	1.17	0.05	.66	.34
	E5d	0.78	1.08	0.05	.61	.39
Notes: *Residual error estimates are not available for binary items when using the WLSMV estimator						

Figure 4.0.2b: Result of CFA of parenting constructs age 5 (MLR estimator)



Model fit: RMSEA = .040, CFI = .98, TLI = .97, SRMR = .030

Table 4.0.8b: Standardised and unstandardised coefficients and variance explained in CFA of parenting constructs age 5 (MLR estimator)

Parenting construct	Indicator name	β	B	S.E.	Variance in indicator explained by construct (R^2)	Residual variance of indicator (e)
'warmth'	**W5a**	0.65	1.00	0.00	.43	.57
	W5b	0.45	1.166	0.17	.21	.79
	W5c	0.63	1.18	0.14	.39	.61
	W5d	0.75	3.949	0.47	.56	.44
'effective management'	**E5a**	0.78	1.00	0.00	.60	.40
	E5b	0.65	1.26	0.13	.42	.58
	E5c	0.81	1.17	0.08	.65	.35
	E5d	0.79	1.10	0.07	.62	.38

4.3. Unconditional latent growth curve models of child externalising and internalising trajectories age 3 to 7.5

The first step in linear growth curve modelling (LGCM) is an unconditional model that assesses the suitability of the trajectories of child externalising and internalising to be estimated in subsequent conditional models. It is necessary to have sufficient variability in the intercept (age 3 child functioning) and in the slope (change through to age 7.5) in order for further models to predict this variance. An acceptable model fit is also a prerequisite.

Table 4.1.0: Means for CBCL externalising and internalising age 3, 4, 5 and 7.5 (raw scores)

CBCL scores	N	Mean	s.d.	% of children in clinical range[a]
Externalising age 3	657	17.85	8.13	19%
Externalising age 4	627	15.88	8.61	13%
Externalising age 5	612	11.60	8.37	23%
Externalising age 7.5	567	12.74	9.49	25%
Internalising age 3	657	11.47	7.27	18%
Internalising age 4	627	10.80	7.21	16%
Internalising age 5	612	6.05	5.18	12%
Internalising age 7.5	567	8.15	6.98	20%
Note: [a] Clinical range criteria are T-scores of 64 of above (Achenbach & Rescorla, 2000).				

Figure 4.1.0: CBCL externalising and internalising mean scores age 3, 4, 5, and 7.5

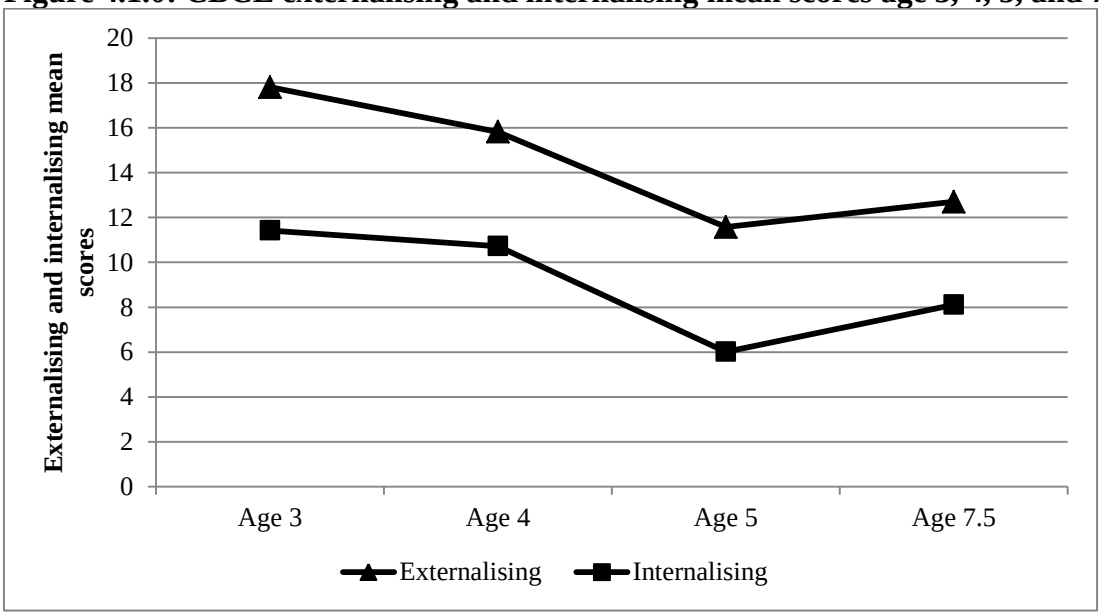
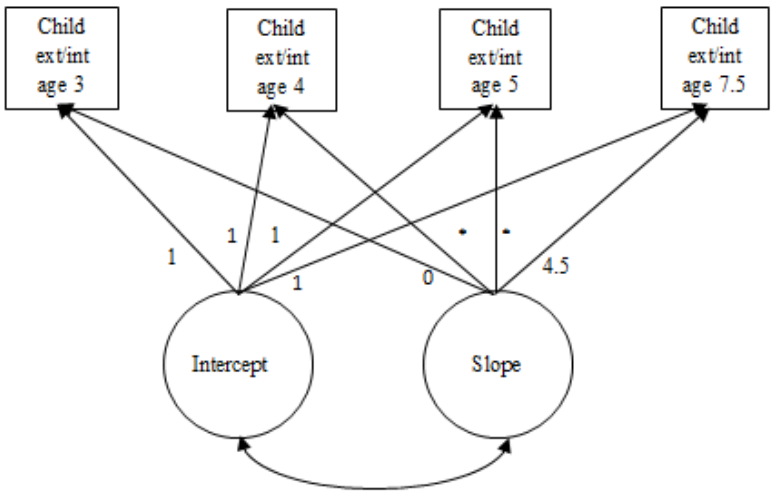


Table 4.1.0 above shows descriptive statistics for child externalising and internalising CBCL scores from age 3 to age 7.5. These are also illustrated in Figure 4.1.0. There appears to be a trend for externalising and internalising mean scores to decrease over time, except between age 5 and 7.5 where there is a slight increase in both CBCL means. For both externalising and internalising, first a linear LGCM was tested by fixing slope factor loadings to 0, 1, 2, and 4.5, which reflected the interval start point and subsequent interval space between child outcomes measured in this study (age 3, 4, 5 and 7.5). All factor loadings for the intercept were fixed at 1. The estimator used in models was MLR as indicator variables (externalising and internalising scores) were continuous. Results showed that these linear models demonstrated a very poor model fit (Externalising: RMSEA=.23, CFI=.75, TLI=.70, SRMR=.10; Internalising: RMSEA=.30, CFI=.38, TLI=.26, SRMR=.22). Because the strictly linear pattern did not fit the data well, a spline model, which allows for non-linear growth, was tested. Spline models for child externalising and internalising, respectively, were specified with the first slope factor loading (age 3) fixed to 0, the last loading (age 7.5) fixed to 4.5, and with the two time points in between freely estimated. This unconditional LGCM is illustrated in Figure 4.1.1 below.

Figure 4.1.1: Unconditional growth curve spline model for child externalising and internalising age 3 to 7.5



Results of the unconditional LGCM for child externalising and internalising trajectories are presented in Table 4.1.1 and in Figure 4.1.2. For externalising the model provided a good fit to the data (RMSEA = .000; CFI = 1.000; TLI = 1.002; SRMR = .015). The intercept, which represents the mean level of child externalising at age 3, was significant (estimate = 17.82, SE = 0.31, p<.001), as was the slope (estimate = -1.15, SE = 0.08, p<.001) which signifies the average change (decrease) in child externalising symptoms between age 3 and 7.5. There was significant residual variance in both the intercept (estimate = 50.53, SE = 3.61, p<.001) and in the slope (estimate = 0.91, SE = 0.18, p<.001), which suggests that there is sufficient variance in the growth factors to be examined in subsequent conditional LGCMs testing predictors of children's externalising trajectories.

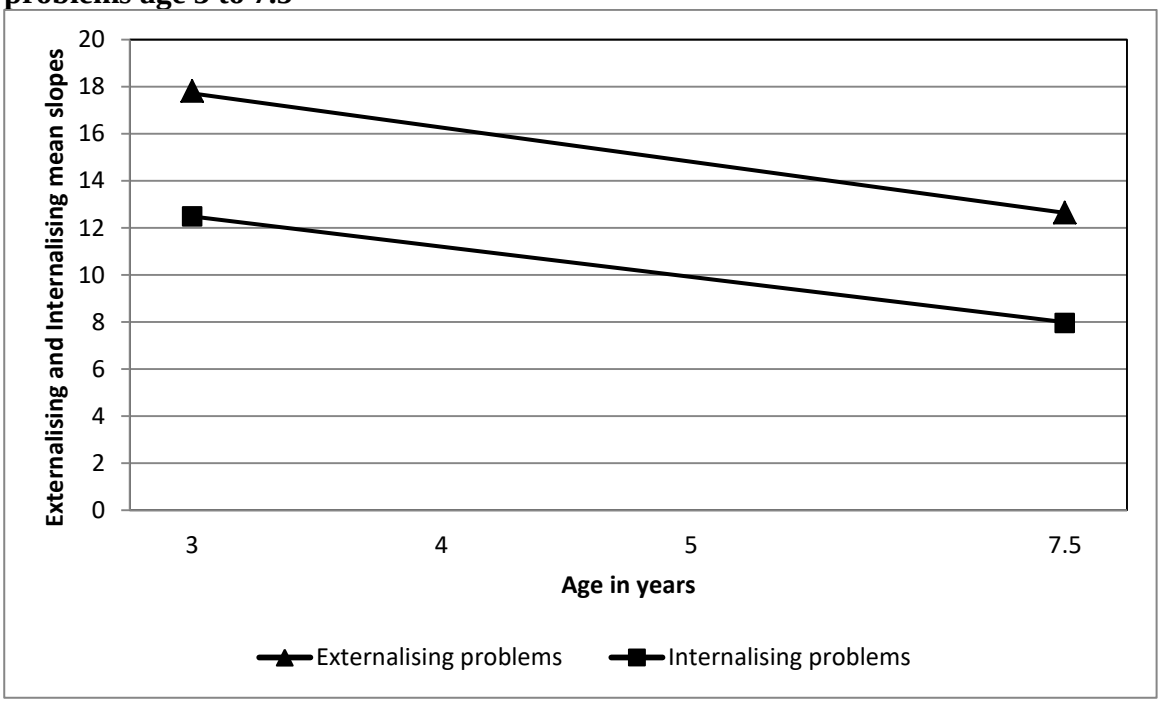
The unconditional model for child internalising also demonstrated a good fit with the data (RMSEA = .050; CFI = .990; TLI = .998; SRMR = .041). The intercept, or the mean level of internalising symptoms at age 3, was significant (estimate = 12.48, SE = 0.34, p<.001), and the slope showed a significant decrease in child internalising behaviour over time (estimate = -1.01, SE = 0.09, p<.001). Residual variances were significant for both the intercept (estimate = 43.55, SE = 4.64, p<.001) and the slope (estimate = 0.74, SE = 0.15, p<.001), meaning that children varied in their externalising trajectories sufficiently for this variability to be studied further in prediction models.

Alternatives to the spline model were also tested, including a quadratic model, and a linear model specified with covariates between residuals of adjacent repeated measures, however fit statistics for both of these model were unsatisfactory. It was not possible to test a piecewise growth model that estimated both the decline in child symptoms from age 3 to 5 and the increase from age 5 to 7.5 in each their growth factor. This was because the last piece in the model from age 5 to 7.5 is not identified, as a minimum three measurement points are required for identification of a growth factor (Kline, 2011).

Table 4.1.1: Unconditional models for child externalising and internalising trajectories age 3 to 7.5

Externalising trajectory	**Estimate**	**SE**	**Sig (p)**
Intercept	17.82	.31	<.001
Slope	-1.15	0.08	<.001
Residual variance intercept	50.53	3.61	<.001
Residual variance slope	0.91	0.18	<.001
Model fit: RMSEA = .086; CFI = .965; TLI = .951; SRMR = .058	-	-	-
Internalising trajectory	**Estimate**	**SE**	**Sig (p)**
Intercept	12.48	0.34	<.001
Slope	-1.01	0.09	<.001
Residual variance intercept	43.52	4.64	<.001
Residual variance slope	0.74	0.15	<.001
Model fit: RMSEA = .050; CFI = .990; TLI = .980; SRMR = .041	-	-	-

Figure 4.1.2: Unconditional growth curve for child externalising and internalising problems age 3 to 7.5



4.4. Longitudinal autoregressive measurement models

In the following section, results of longitudinal measurement models are presented. These test to what extent the respective parenting practices (warmth and effective management) and child functioning (externalising and internalising) are continuous over time and generally represent the same underlying measure at different assessment points. This is a first step before examining longitudinal (cross-lagged) relationships between parent and child domains, which are studied in research questions 5 to 7.

4.4.1. Parental warmth age 2-3 and 5

Figure 4.1.3 illustrates the hypothesised longitudinal autoregressive measurement model for parental warmth with age 2-3 and age 5 time points, each of which is a latent variable. The first factor loading for each of these variables was fixed at the value 1 in order to scale variables. Factor loadings were also constrained to be equal across time (1, a, b, c), and correlations between residuals of corresponding items were specified as illustrated with double headed arrows. This was in order to build in the assumptions of factorial invariance of autoregressive models and in order to identify models. The WLMSV estimator was used as some indicators were binary.

Results of the longitudinal autoregressive measurement model for parental warmth are shown in Figure 4.1.4. The standardised regression path between warmth at age 2-3 and age 5 was $\beta = .74$ ($p<.001$), indicating that parental warmth was highly stable over time. Factor loading were large ranging from .63-.88, and across the two time points, corresponding factor loadings appeared relatively equal. There was significant correlation between corresponding residuals of two of the four indicators. Overall, the model had a very good fit as assessed against multiple indices (RMSEA =.021, CFI=0.996, TLI=.994,

WRMR=.60). The fit of the specified model was slightly better than the baseline model with no factorial invariance constraints (RMSEA=.035, CFI=.989, TLI=.984, WRMR=.647). Overall, these results indicate that the assumptions of factorial invariance imposed on the models are appropriate, and therefore the latent measure of parental warmth at age 2-3 constitute the same underling construct as that measured at age 5. This means that the longitudinal measurement model provides a good base for comparison of early and later parental warmth in term of predicting other variables such as child functioning.

Figure 4.1.3: Hypothesised autoregressive measurement model for parental warmth age 2-3 and 5

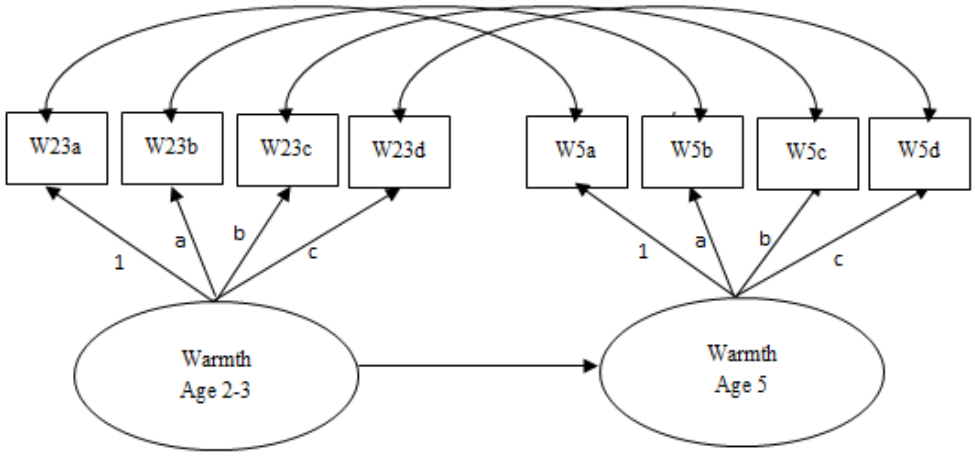
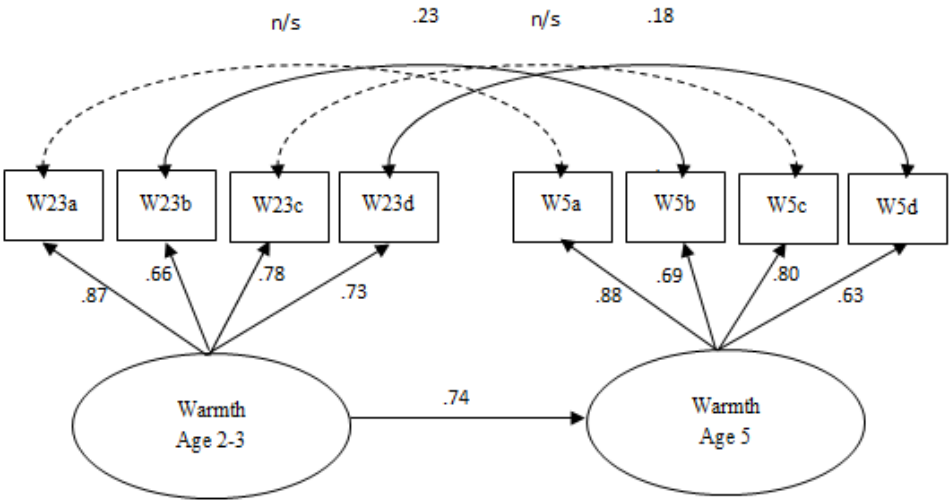


Figure 4.1.4: Results of autoregressive measurement model for parental warmth age 2-3 and 5



Model fit: RMSEA =.021, CFI=0.996, TLI=.994, WRMR=.602

4.4.2. Parental effective management age 2-3 and 5

Illustrated in Figure 4.1.5 is the theoretical longitudinal autoregressive measurement model for parental effective management at age 2-3 and age 5. As for the previous parenting construct, the first indicator in this model was fixed for scaling purposes and each corresponding factor loading was constrained to be equal (2, d, e, f), and errors of indicators were set to correlate. The MLR estimator was used in these analyses because all indicators were continuous. Results of the longitudinal measurement model are shown in Figure 4.1.6. The standardised regression path between effective management at age 2-3 and age 5 was β= .36 (p<.001), indicating that effective management was moderately stable from age 2-3 to age 5. The loadings of indicators onto factors were large (.63-.82) and two of the four loading looked equal across time, although none of the errors of the indicators correlated significantly across the two time points. However, assessing the overall model against several fit indices, there was a good fit of the model to the data (RMSEA =.037, CFI=0.987, TLI=.980, SRMR=.061). The model fitted slightly less well compared to the baseline model without any constraints (RMSEA=.031, CFI=.991, TLI=.986, SRMR=.024), although the models are comparable as both have very good fit, and also the parameters for the regression path between age 2-3 and age 5 effective management are equal between these models. Overall, results suggest that there is some consistency in measurement between age 2-3 and age 5, although factorial invariance is somewhat weak. This should be considered when interpreting the results in the cross-lagged models examining the main research questions in this study.

Figure 4.1.5: Hypothesised autoregressive measurement model for parental effective management age 2-3 and 5

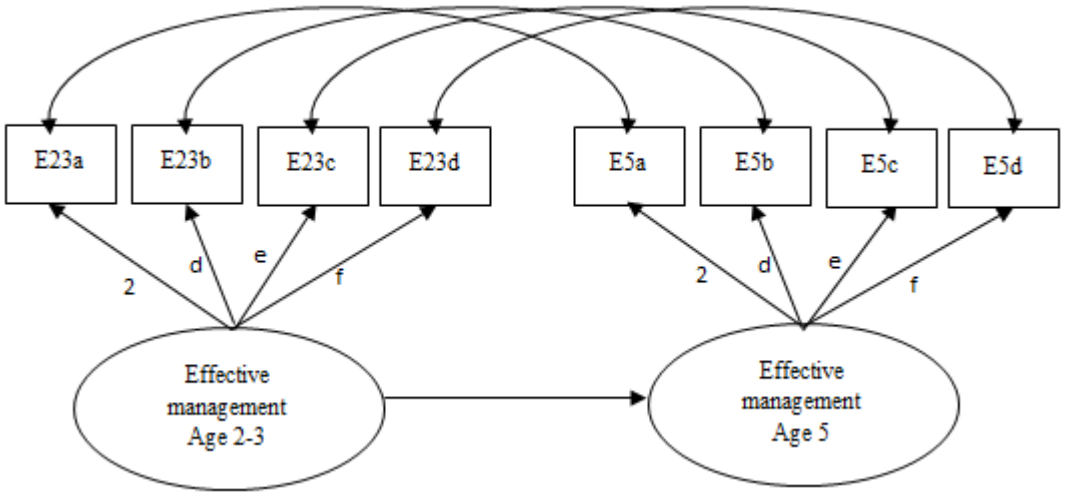
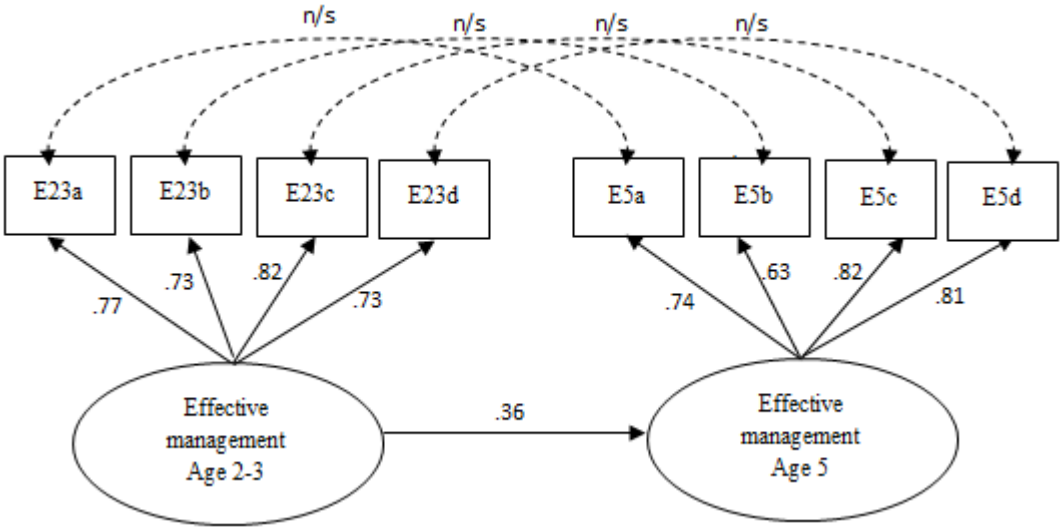


Figure 4.1.6: Results of autoregressive measurement model for parental effective management age 2-3 and 5



Model fit: RMSEA =.037, CFI=0.987, TLI=.980, SRMR=.061

4.4.3. Child externalising and internalising age 2, 3, 4, 5 and 7.5

Child externalising and internalising were measured by a single manifest score on the CBCL at age 2, 3, 4, 5, and 7.5. These measures were entered into an autoregressive model in order to check the extent to which the measures provided a good longitudinal measure for use in the later cross-lagged models. In these models, assumption of factorial invariance cannot be

checked because there is no latent aspect to these variables, but regression paths between time points can be inspected, and the model can be assessed in term of fit to the data. Scores on the CBCL are continuous for both externalising and internalising, and therefore the MLR estimator was used in these analyses. Initial models were run with first order effects, meaning that child outcomes were predicted only by the immediately preceding measure. However, these models did not have a good model fit for either externalising or internalising, and therefore second order effects were included where each measure was modelled to predict not just the next measure but also on the following one. This autoregressive measurement model, applied to both externalising and internalising, is illustrated in Figure 4.1.7.

Results of the final models with first and second order effects are shown in Figure 4.1.8 for externalising, and in Figure 4.1.9 for internalising. For externalising the standardised first order autoregressive paths ranged between β= .46 and β= .62 (p<.001) and second order effects ranged between β= .12 (p<.01) and β= .28 (p<.001). For age 4, 5 and 7.5 externalising, all predicted by both first and second order measures, the variance explained was R^2=.48, R^2=.47 and R^2=.49, respectively. For age 3 externalising, which was predicted only by first order previous behaviour as no second order variable was available, the variance explained was slightly lower (R^2=.37). This is comparable to the variance explained by the first order effect between age 3 and age 4 of R^2=.38. Therefore, the stability of externalising across time was very similar between time points. Overall fit of the model to the data was very good (RMSEA =.060, CFI=0.993, TLI=.977, SRMR=.020).

For the internalising autoregressive longitudinal model, the standardised regression paths ranged between β= .44 and β= .64 (p<.001) for first order effects, and for second order effects they were between β= .18 and β= .20 (p<.001). The variance explained in the internalising measures at age 4, 5 and 7.5, predicted by both first and second order effects,

were R^2=.46, R^2=.35, R^2=.33, respectively. For age 3 internalising the variance explained was R^2=.41, which was fairly high considering it was predicted only by first order (age 2) internalising, compared to the variance explained by first order effects between age 3 and age 4 internalising (R^2=.28). Therefore, for child internalising, the consistency across time seemed to attenuate in the sense that children's internalising problems were predicted less by previous problems as children moved from toddler age to early school age. Overall the model fitted the data well according to all fit indices (RMSEA =.056, CFI=0.992, TLI=.975, SRMR=.019).

Figure 4.1.7: Hypothesised autoregressive measurement model for child externalising and internalising age 2 to 7.5

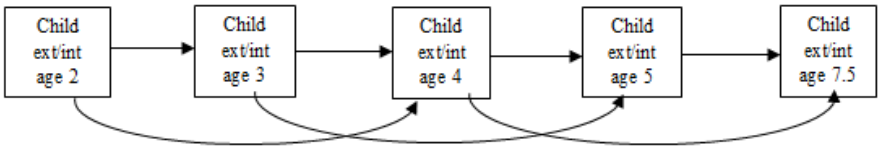
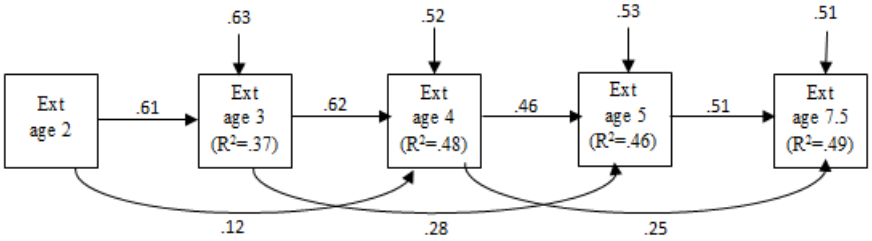
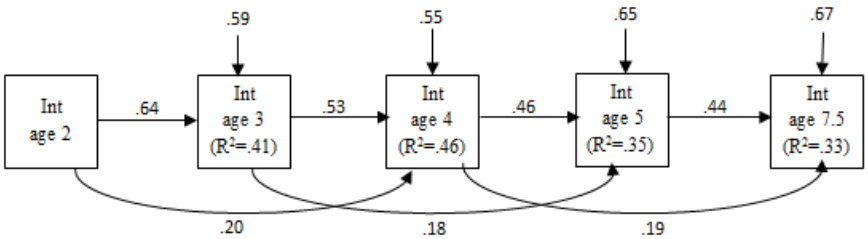


Figure 4.1.8: Results of autoregressive measurement model for child externalising age 2 to 7.5



Model fit: RMSEA =.060, CFI=0.993, TLI=.977, SRMR=.020

Figure 4.1.9: Results of autoregressive measurement model for child internalising age 2 to 7.5



Model fit: RMSEA =.056, CFI=0.992, TLI=.975, SRMR=.019

4.5. Description of study variables

An overview and descriptive statistics for all dependent, predictor and control variables in this study are reported in Table 4.2.0 below.

Table 4.2.0: Descriptive statistics for study variables

	N	Min	Max	Mean	Std. Deviation	Skewness	
CONTINUOUS VARIABLES:						**Skew**	**Std. Error**
Parental warmth age 2 and 3 aggregated (mean of 4 items)	637	-2.73	.85	.0050	.76907	-1.071	.097
Parental warmth age 5 (mean of 4 items)	574	-2.44	.63	-.0003	.73207	-1.525	.102
Parental effective management age 2 and 3 aggregated (mean of 4 item)	554	-3.35	1.73	.0001	.82657	-.407	.104
Parental effective management age 5 (mean of 4 items)	564	-3.23	1.77	.0006	.82285	-.328	.103
Child conduct problem ('externalising') age 2	730	32.00	95.00	59.4877	8.20890	.231	.090
Child emotional problem ('internalising') age 2	730	29.00	78.00	56.3288	8.52521	-.382	.090
Child conduct problem ('externalising') age	657	28.00	86.00	56.0000	9.37596	.108	.095
Child emotional problem ('internalising') age 3	657	29.00	86.00	54.3227	9.57381	.063	.095
Child conduct problem ('externalising') age 4	627	28.00	89.00	53.6523	10.48841	.153	.098
Child emotional problem ('internalising') age 4	627	29.00	82.00	53.3078	10.07905	-.084	.098
Child conduct problem ('externalising') age 5	612	33.00	82.00	57.8039	10.21091	-.347	.099
Child emotional problem ('internalising') age 5	612	33.00	80.00	51.1144	9.57698	.122	.099
Child conduct problem ('externalising') age 7.5	567	33.00	85.00	59.0617	10.56185	-.236	.103
Child emotional problem ('internalising') age 7.5	567	33.00	89.00	54.5150	10.65402	.155	.103
Household income (13 categories)	723	1	11	3.78	1.917	.536	.091
Parent depression score	729	0.00	55.00	16.7490	10.66101	.901	.091
Parent age	725	16	69	26.91	6.513	1.362	.091
CATEGORICAL VARIABLES:	**N**			**%**			
FCU intervention (age 3)	731			50%			
Child gender (female)	731			50%			
Parent race (white)	730			58%			
Parent education (less than high school)	731			24%			

Note:
1. Measures of parenting are manifest variables computed by taking the mean of z-scores of items.
2. Unless indicated otherwise, measures are from age 2 child assessments.
3. T-scores for child externalising an internalising are shown here, but in all analyses raw and unadjusted scores are used

4.6. Correlations between study variables

Concurrent and longitudinal bivariate correlations between main variables in this study were calculated and are shown in Table 4.3.0 below. It should be noted that because age 2 and age 3 parenting items are aggregated, the relationship between early parenting and age 3 child outcomes is not truly concurrent and some of this relationship could be considered longitudinal.

Table 4.3.0: Bivariate correlations between study variables

	W23	EM23	W5	EM5	EXT2	EXT3	EXT4	EXT5	EXT7.5	INT2	INT3	INT4	INT5	INT7.5
W23	1													
EM23	.48***	1												
W5	.69***	.41***	1											
EM5	.35***	.33***	.37***	1										
EXT2	-.10*	-.18***	-.07	-.07	1									
EXT3	-.21***	-.30***	-.17**	-.09*	.61***	1								
EXT4	-.22***	-.29***	-.19***	-.18***	.49***	.69***	1							
EXT5	-.28***	-.21***	-.23***	-.15***	.47***	.60***	.65***	1						
EXT7.5	-.25***	-.20***	-.19**	-.14**	.38***	.52***	.58***	.67***	1					
INT2	-.10*	-.15**	-.07	-.04	.50***	.38***	.31***	.28***	.21***	1				
INT3	-.16***	-.26***	-.19***	-.07	.35***	.58***	.45***	.36***	.35***	.64***	1			
INT4	-.16***	-.20***	-.17**	-.14**	.28***	.42***	.63***	.41***	.39***	.54***	.66***	1		
INT5	-.14**	-.05	-.08	-.07+	.23***	.33***	.42***	.58***	.42***	.38***	.48***	.58***	1	
INT7.5	-.15**	-.13**	-.06	-.09+	.24***	.32***	.37***	.41***	.60***	.28***	.41***	.44***	.54***	1
INTERVENTION	-.04	.02	-.04	.09*	.02	-.01	-.09*	-.05	-.01	.03	-.01	-.06+	-.06	-.01
CHILD FEMALE	.02	.10*	-.01	-.03	-.06+	-.10*	-.09*	-.05	-.08*	.06	.04+	.03	.11*	.06
WHITE	.21***	.07	.17***	.11*	.07+	.03	.01	.02	-.01	-.08*	-.04	-.08+	.02	.03
LESS THAN HIGH SCHOOL	-.16**	-.17**	-.10+	-.09+	.06	.09**	.09**	.06	.08	.17***	.14***	.13***	.04	.05
INCOME	.14**	.14**	.05	.14**	-.08+	-.10**	-.07	-.05	-.10**	-.15***	-.12**	-.10*	-.04	-.10*
PARENT DEPESSION	-.12**	-.13**	-.07*	.05	.16***	.26***	.20***	.21***	.23***	.26***	.28***	.20***	.22***	.22***
PARENT AGE	.19***	.05	.16***	.03	-.06	-.01	.01	.03	.02	-.03	-.04	-.03	.02	.08*

+p<.10, *p<.05, **p<.01, ***p<.001
W23 = warmth age 2-3
W5 = warmth age 5
EM23 = effective management age 2-3
EM5 = effective management age 5
EXTX = CBCL externalising score age X
INTX = CBCL internalising score age X

4.6.1. Continuity of child externalising and internalising

In terms of children's externalising behaviour, there were moderate to strong correlations between CBCL scores at ages 2, 3, 4, 5 and 7.5 (range r=.38-.69, p<.001). Similarly, child internalising showed modest to strong correlations across these age points (range r=.28-.66, p<.001). Therefore, there is indication that there was a moderate to high degree of continuity of child conduct problems and emotional problems over time.

Because correlations of CBCL scores include also normally functioning children who scored low on these problems, additional analyses were carried out that examined the continuity of clinical levels of externalising and internalising problems across time. For these analyses, binary variables (1=clinical, 0=non-clinical) were created for each assessment point, and logistic regressions were carried out with age 2 clinical externalising and internalising problems predicting corresponding clinical problems at age 3, 4, 5, and 7.5. Results are in Table 4.3.1 showing odds ratios. As expected, continuity was highest from age 2 to age 3, and lowest between age 2 and age 7.5. The odds of children with clinical levels of CBCL externalising problems at age 2 to be at clinical levels at age 3 were nine times higher than children with non-clinical levels (odds ratio=8.96, p<.001, 95% CI=5.87-13.68), and their odds of still experience clinical externalising problems when they reached the age of 7.5 were three times higher (odds ratio=2.97, p<001, CI=2.03-4.33). Similarly for children with clinical internalising problems at age 2, their odds of experiencing clinical problems at age 3 were twelve times that of non-clinical children (odds ratio=12.05, p<001, CI=7.60-19.10), and they had twice the odds at age 7.5 (odds ratio=2.05, p<001, CI=1.27-3.29).

Table 4.3.1: Continuity of children's clinical problems (logistic regressions with age 2 clinical externalising and internalising problems predicting clinical problems at age 3, 4, 5 and 7.5)

	Diagnosis at			
	Age 3	**Age 4**	**Age 5**	**Age 7.5**
	Odds ratio (95%CI)	**Odds ratio (95%CI)**	**Odds ratio (95%CI)**	**Odds ratio (95%CI)**
Clinical externalising age 2	8.96*** (5.87-13.68)	4.34*** (2.78-6.80)	3.88*** (2.66-5.66)	2.97*** (2.03-4.33)
Clinical internalising age 2	12.05*** (7.60-19.10)	7.78*** (4.85-12.47)	5.63*** (3.37-9.41)	2.05*** (1.27-3.29)
$^{+}$p<.10, *p<.05, **p<.01, ***p<.001				

4.6.2. Comorbidity of child externalising and internalising

There were large concurrent correlations between externalising and internalising CBCL scores (range r=.50-.63, p<.001), which suggests comorbidity of child emotional and conduct problems. However, also these correlations include children scoring low on both externalising and internalising, and therefore these correlations do not represent true comorbidity, which is defined as clinical levels of concurrent conduct and emotional problems. Therefore, the binary variables created as described above were used in logistic regressions with externalising as a concurrent predictor of internalising at each assessment age. Analyses could also have been run with internalising as a predictor of externalising as the results are the same. Results (Table 4.3.2) show that at age 2 children with clinical levels of externalising had over four times higher odds of also experiencing clinical internalising (odds ratio = 4.58, p<001, CI=3.12-6.74). Examining comorbidity across assessment ages, it appears that comorbidity increases as children get older, and at age 7.5 children with clinical levels of externalising had nine times higher odds of also manifesting clinical internalising (odds ratio = 9.14, p<001, CI=5.70-14.66).

Table 4.3.2: Comorbidity of clinical problems (logistic regressions with clinical externalising predicting concurrent clinical internalising problems at age 2, 3, 4, 5 and 7.5)

Age 2	Age 3	Age 4	Age 5	Age 7.5
Odds ratio (95%CI)	**Odds ratio (95%CI)**	**Odds ratio (95%CI)**	**Odds ratio (95%CI)**	**Odds ratio (95%CI)**
4.58*** (3.12-6.74)	5.56*** (3.60-8.61)	8.12*** (4.98-13.24)	9.72*** (5.59-16.88)	9.14*** (5.70-14.66)
$^{+}$p<.10, *p<.05, **p<.01, ***p<.001				

4.6.4. Continuity of parenting and correlation between parenting dimensions

In terms of continuity of parenting between the two assessment points examined in this study, at age 2-3 and age 5 (Table 4.3.0), this was high for warmth (r=.69, p<.001) and more modest for effective management (r=.33, p<001). There was concurrent correlation between the two parenting constructs, r=.48 (p<.001) at age 2-3 and r=.37 (p<.001) at age 5, suggesting that parents who were observed to be high in warmth also tended to more effectively manage their children.

4.6.5. Correlations between parenting and child outcomes

Bivariate correlation between latent parenting constructs and concurrent and longitudinal child externalising and internalising behaviours (Table 4.3.0) ranged from small and insignificant to modest and significant associations (range r=-.05, ns to r= -.30, p<.001). Parenting constructs were more strongly correlated with child externalising than internalising behaviour. Correlations were larger for early parenting (age 2-3) than for later parenting (age 5) in relation to child outcomes at age 5 and 7.5. The strength of correlations with child outcomes appeared to followed different trajectories for the two respective parenting constructs. Effective management had stronger concurrent and short-term correlation with child outcomes (age 3 and 4) than parental warmth, but correlations then attenuated over

time as children got to age 5 and 7, but for warmth the correlation with child functioning became stronger at these later child ages.

4.6.6. Socioeconomic and demographic variables and their correlation with parenting and child outcomes

Shown in Table 4.3.0 are also the bivariate relationships of demographic and socio-economic control variables at age 2, to child outcomes and parenting practices at each assessment point. Any relationships highlight the need to include these covariates in analyses in order to adjust for influences other than parenting in the main analyses of this study.

4.6.6.1. Gender

Girls were reported by their parent to have slightly lower externalising levels at age 3, 4 and 7.5 ($r=-.10$, $p<.05$, $r= -.09$, $p<.05$, $r= -.08$, $p<.05$, respectively), but their internalising problems were higher at age 5 ($r= .11$, $p<.01$). Girls also had parents who were observed to practice higher levels of effective management at age 2-3 ($r= .10$, $p<.05$), but there was no gender difference at age 5, and neither was gender related to parental warmth at either assessment age.

4.6.6.2. Race

Children of white parents had slightly lower internalising problems at age 2 ($r=-.08$, $p<.05$) but did not differ on any other child outcome. White parents had higher scores on observed warmth at age 2-3 ($r= .21$ $p<.01$) and at age 5 ($r= .17$, $p<.01$), and higher effective management scores at age 5 ($r= .11$, $p<.05$).

4.6.6.3. Parent education and income

Parents with less than high school education were lower in warmth ($r= -.16$, $p<.01$) and in effective management ($r= -.17$, $p<.01$) at child age 2-3, and their children had higher levels

of externalising problems at age 3 and age 4 (r=.09, p<.01 for both outcomes) and higher internalising problems at age 2, 3, and 4 (r= .17 p<.001, r=.14 p<.001, r=.13 p<.001). Higher family income was associated with higher warmth at age 2-3 (r= .14, p<.01), and with higher effective management at age 2-3 and 5 (both r= .14, p<.01). Higher income was also correlated with lower externalising problems at age 3 and age 7.5 (both r= -.10 p<.01), and with lower internalising at all ages (range r=-.10 p<.05 to r=-.15, p<.001) except at age 4.

4.6.6.4. Parent depression

Parent depression at age 2 was correlated with higher externalising and internalising outcomes at all ages (range r=.16 to .28, p<.001).

4.6.6.5. Parent age

Older parents were observed to be more warm at age 2-3 (r= .19, p<.01) and at age 5 (r= .16, p<.01), but age of parent was not associated with child functioning, except for internalising at age 7.5 which was slightly higher for children of older parents (r= .08, p<.05).

4.7. Relationship between observed global parenting measures and micro-social parenting measures

As described previously in the methods section, both of the observed parenting constructs used in this study were based on global measures. This was the HOME that was rated by the home visitor, and the COIMP that was reported by the coder of the video recorded parent-child interaction tasks. In the original study, also a microsocial measure of positive parenting was available. This was based on the coding system the Relationship Affect Coding System (RACS; Peterson et al., 2008) that was used for coding parent-child interactions in the structured tasks during the home visit. Because this micro-social measure of positive parenting was not able to separate out the two theoretical aspects of parenting, it was not suitable for use in the current study. However, in order to better understand how the global measures used in this study relate to this this micro-social measure, which can provide some indication of the reliability of these global measures, bivariate correlations were calculated. The RACS micro-social measure was positive parenting behaviours measured in rate per minute across all 7 interaction tasks (around 55 minutes in total). Also this measure was based on aggregating age 2 and age 3 assessments, like the global measures warmth and effective management. Result of correlations are presented in Table 4.4 below, and also shown are bivariate associations of the global and microsocial parenting measures to child externalising and internalising outcomes. The microsocial measure of positive parenting at age 2-3 showed a moderate correlation with warmth at age 2-3 ($r=40$, $p<.001$), and a slightly more modest correlation with effective management at age 2-3 ($r=.27$, $p<.001$). Overall, these results demonstrate that the global measures of positive parenting used in this study have convergent validity with positive parenting measured through a micro-social approach.

In terms of associations with child externalising and internalising at age 3, 4, 5 and 7.5, the micro-social parenting measure demonstrated only two significant and relatively small to modest correlations with child externalising (age 4: β = -.08, p <.05) and internalising (age 3: β = -.14, p <.01), whereas the global measures demonstrated a large number of significant and more substantial correlations with these child outcomes. This indicates that the global parenting measures used in this study are better predictors of child adjustment than the micro-social observational measure of positive parenting. Therefore in terms of predictive validity, the global measures appear to represent better measures of positive parenting.

Table 4.4: Bivariate correlations: observed global parenting measures (warmth and effective management), observed microsocial measures (positive parenting), and child externalising and internalising

	Global measures		**Microsocial measure[a]**
	Warmth age 2-3 (HOME)	**Effective management age 2-3 (COIMP)**	**Positive parenting age 2-3 (RACS)**
Warmth age 2-3	1		
Effective management age 2-3	**.38*** **	1	
Positive parenting age 2-3	**.40*** **	**.27*** **	1
Externalising age 3	**-.18*** **	**-.28*** **	-.07+
Externalising age 4	**-.20*** **	**-.29*** **	**-.08***
Externalising age 5	**-.25*** **	**-.19*** **	-.05
Externalising age 7.5	**-.23*** **	**-.21*** **	-.03
Internalising age 3	**-.13****	**-.23*** **	**-.14****
Internalising age 4	**-.14****	**-.20*** **	-.05
Internalising age 5	**-.12****	-.05	< -.01
Internalising age 7.5	**-.13****	**-.13****	< -.01

[+]p<.10, *p<.05, **p<.01, ***p<.001

[a] Rate per minute across all observed parent-child interaction tasks

4.8. Testing the appropriateness of using whole study sample

As noted previously, half of the study sample received the Family Check-Up intervention between age 2 and age 3 assessments. In the current study the sample was used to examine developmental rather than intervention questions. A consideration in this study was therefore the appropriateness of examining developmental questions using the whole sample from a study with an intervention design. Although intervention status is controlled for in all analyses, the reality of half of the sample receiving an intervention could be problematic if the intervention changed the relationship between parenting and child outcomes. In order to explore this, regression analyses were carried out separately for the control and the intervention group. A total of 24 regressions were computed in order to cover the many combinations of attachment and social learning parenting at age 2-3 and age 5 predicting externalising and internalising at age 3, 4, 5 and 7.5. These included all control variables used in main analyses of this study. In further analyses that repeated all of these regressions using the whole study sample, an interaction effect between the parenting predictor variable and group status was added as a predictor of child outcomes. This provided a test of whether groups were different in terms of the association between parenting and child externalising and internalising functioning. Results of these analyses are presented in Table 4.5. These showed that coefficients for the control group and the intervention group were largely comparable, and although there appeared to be some differences there was no pattern that relationships were consistently larger for the control group or the intervention group. Moreover, the interaction between groups status and parent predictor showed no significant effects for any of the regressions, with most interaction coefficients being close to zero and with large p values. This indicates that differences between intervention and control groups were not statistically significant and this study therefore made use of the whole sample rather than just the control group. It is worth noting that a number of published papers have also

used the whole of the Early Steps sample for studying developmental research questions (e.g. Hyde et al., 2013; Trentacosta et al., 2008; Waller et al., 2012; Waller et al., 2014; Waller et al., 2015).

Table 4.5: Testing differences between control and intervention group in association between parenting and child outcomes

					Interaction between predictor and group status	
Predictor		**Child outcome**	**Control**	**Intervention**	**β**	**Sig (p)**
Effective management age 2-3	→	Ext age 3	-.14**	-.20***	-.02	.68
Effective management age 2-3	→	Ext age 4	-.20***	-.18**	.05	.37
Effective management age 2-3	→	Ext age 5	-.16*	-.09	.05	.38
Effective management age 2-3	→	Ext age 7.5	-.11+	-.16*	-.02	.71
Effective management age 2-3	→	Int age 3	-.17**	-.16**	.001	.98
Effective management age 2-3	→	Int age 4	-.11*	-.13	.005	.93
Effective management age 2-3	→	Int age 5	-.004	-.01	-.01	.82
Effective management age 2-3	→	Int age 7.5	-.11+	-.08	.02	.75
Effective management age 5	→	Ext age 5	-.15*	-.10*	.01	.81
Effective management age 5	→	Ext age 7.5	-.22***	-.06	.06	.28
Effective management age 5	→	Int age 5	-.08	-.03	.03	.58
Effective management age 5	→	Int age 7.5	-.16*	-.02	.07	.22
Warmth age 2-3	→	Ext age 3	-.18**	-.12*	.03	.46
Warmth age 2-3	→	Ext age 4	-.24***	-.14*	.08	.11
Warmth age 2-3	→	Ext age 5	-.24***	-.29***	-.008	.87
Warmth age 2-3	→	Ext age 7.5	-.28***	-.20**	.04	.71
Warmth age 2-3	→	Int age 3	-.10*	-.09+	.002	.96
Warmth age 2-3	→	Int age 4	-.10*	-.08	.007	.89
Warmth age 2-3	→	Int age 5	-.12+	-.15*	-.03	.60
Warmth age 2-3	→	Int age 7.5	-.17*	-.15*	-.001	.99
Warmth age 5	→	Ext age 5	-.19**	-.24**	.003	.95
Warmth age 5	→	Ext age 7.5	-.25**	-.13+	.07	.26
Warmth age 5	→	Int age 5	-.005	-.10	-.03	.59
Warmth age 5	→	Int age 7.5	-.12	-.03	.06	.37

Notes: Control variables in models are: child behaviour age 2, gender of child, parent race, parent education, income, parent depression, parent age.
$^{+}$p<.10, *p<.05, ** p<.01, ***p<.001

CHAPTER 5: Results of main analysis

RESULTS PART I: Early parental warmth and effective management as predictors of child conduct and emotional problems

This part reports results of the first substantive research questions that examined early parenting (age 2-3) associated with attachment theory (warmth) and parenting related to social learning theory (effective management) as predictors of child conduct and emotional functioning. First, in questions 1 and 2, the two theoretical parenting constructs were examined in separate models. Then in question 3, both parenting dimensions were examined together; allowing an examination of their unique relationship to child functioning, which provided a direct comparison of these theoretical aspects of parenting. In question 3, the effects of concurrent interactions between parenting dimensions were also tested, and examined in question 4 were effects of their longitudinal interaction.

The relationship between parenting and child functioning was examined in two ways in these questions. First a series of structural equation models (SEMs) examined the association between parenting and child functioning at each assessment point for externalising and internalising, at age 3, 4, 5 and 7.5. Then, latent growth curve models (LGCMs) examined parenting as predictors of child trajectories of child externalising and internalising behaviour from age 3 to age 7.5. Growth models were not carried out for question 4 that examined child outcomes at age 5 and 7.5, because for LGCM a minimum of three measurement points are required.

All SEM and LGCM models were run with covariates on the outcomes and on parenting constructs, which allowed family background variables to have direct as well as indirect (mediated) effect on child emotional and behavioural problems as suggested in previous research. Preliminary models were run with covariates just on child outcomes, but models that allowed covariates to be mediated through parenting demonstrated better model fit.

5.1. Results of research question 1: Does early parental warmth (age 2-3) predict child externalising and internalising behaviour at age 3, 4, 5 and 7.5?

This research question tests attachment theory (Bowlby, 1958, 1988; Ainsworth et al., 1978) as an explanatory framework for linking parenting practice with child behavioural and emotional functioning. It was hypothesised that early attachment related parenting, 'warmth', at age 2-3 would predict lower levels of child externalising and internalising problems at age 3, 4, 5, and 7.5.

5.1.1. SEM models: warmth at age 2-3 predicting externalising and internalising at age 3, 4, 5 and 7.5

The hypothesised structural equation model for examination of early parental warmth as a predictor of child outcomes is shown in Figure 5.1.1a below. A model was run for each respective age (age 3, 4, 5 and 7.5) with externalising and internalising entered simultaneously and allowed to covary. Results of models are shown in Figures 5.1.4 to 5.1.7 (Appendix D) that show all significant regression paths. Goodness of fit indices indicated that all models had a good fit with the observed data (RMSEA <.05; CFI and TLC >.95; WRMR <.90). Table 5.1.1 below summarises the unstandardised (B) and standardised coefficients (β) between warmth at age 2-3 and child outcomes in each of the respective models. Standardised coefficients are also presented graphically in Figure 5.1.2 showing child externalising outcomes, and in Figure 5.1.3 showing internalising outcomes.

Results showed that, over and above child previous behaviour and effects of covariates, higher levels of early parental warmth (age 2-3) were significantly associated with lower externalising problems at age 3, 4, 5 and 7.5 (range $\beta = -.15$, $p < .001$ to $\beta = -.27$, $p < .001$) and with lower internalising problems at all child ages (range $\beta = -.09$, $p < .05$ to $\beta = -$

.16, p <.01). At each child age, warmth tended to be more predictive of child conduct problems than of emotional problems. The strength of the relationship appeared to change over time, as indicated in Table 5.1.1 and displayed visually in Figures 5.1.2 and 5.1.3, showing a weaker concurrent and short-term association between parental warmth and child externalising and internalising, but as children got older the relationship appeared to become stronger. The next set of analysis will provide further investigation of the predictive effect of early parental warmth on change in child problems over time.

5.1.2. Conditional LGCM models: warmth at age 2-3 predicting externalising and internalising trajectories age 3 to 7.5

Conditional latent growth curve models (LGCMs) examined early parental warmth at age 2-3 as a predictor of child externalising and internalising trajectories from age 3 to 7.5. Figure 5.1.1b illustrates this theoretical model. Externalising and internalising trajectories were analysed in each their model. As reported previously in the preliminary analyses that examined the unconditional LGCMs, both child externalising and internalising problems reduced over time from age 3 to 7.5.

5.1.2.1. Externalising trajectories

Results of the conditional model predicting child externalising are shown in Table 5.1.2 below that reports effects of parenting and covariates on the intercept and slope. Results of the full model are in Figure 5.1.8 (Appendix D). The overall model provided an excellent fit with the data (RMSEA = .000; CFI = 1.000; TLI = 1.001; WRMR = .545). Results showed that the intercept, which represents the initial levels of child externalising at age 3, was predicted by early parental warmth at age 2-3 in the direction that higher levels of early parental warmth was significantly related to lower initial problems (β = -.15, p<.001). In

term of prediction of the slope, which is the rate of change of child externalising problems from age 3 to 7.5, higher levels of parental warmth were associated with a steeper decrease in child problems over time (β = -.20, p<.01). In addition, there was significant negative correlation between the intercept and the slope (β = -.41, p<.001), and higher levels of age 2 externalising problems predicted a greater decrease in symptoms (β = -.20, p<.001), which indicates that children who had higher levels of externalising problems at an early age tended to experience a steeper reduction in these problems through to age 7.5.

5.1.2.2. Internalising trajectories

Results of the prediction model for children's internalising trajectories are reported in Table 5.1.3. The full model is in Figure 5.1.9 (Appendix D). This model had good model fit with the data (RMSEA = .025; CFI = .987; TLI = .980; WRMR = .706). Results showed that the intercept, or children's initial levels of internalising problems at age 3, was predicted by early parental warmth at age 2-3, with the pattern that higher levels of parental warmth predicted lower initial levels of child symptoms (β = -.10, p<.05). In terms of the slope, which represents the rate of decrease in child internalising from age 3 to age 7.5, early parental warmth was not a significant predictor. A variable that predicted the slope was age 2 internalising (β = -.55, p<.001), and there was a negative correlation between the intercept and slope (β = -.56, p<.001), which means that children who had higher levels of problems at toddler age experienced a steeper reduction in their internalising symptoms over time through to age 7.5.

5.1.3. Conclusion

These results support the hypothesis that higher levels of early attachment related parenting ('warmth') at age 2-3 predict lower levels of child conduct and emotional problems at age 3,

4, 5 and 7.5. For externalising behaviour, effects of warmth were weaker at toddler age but became stronger at early school age, which was confirmed in trajectory analysis showing that in addition to predicting initial levels of child problems at age 3, early warmth predicted a steeper reduction in child externalising problems through to age 7.5. This indicates that there might be 'sleeper effects' of early parental warmth on child conduct problems. As for child internalising problems there were significant effects of early parental warmth on all child assessment points, and although these effects appeared to increase slightly over time, early warmth did not have a significant effect on trajectories of child internalising beyond the prediction of lower initial levels of child symptoms at age 3. This demonstrated that early warmth had enduring effects on lower child internalising problems from toddler age to early school age. Overall findings suggest that early parenting practices associated with attachment theory have a reductive effect on child problems longer-term, especially in relation to conduct problems. The investigations presented here constitute merely preliminary analyses of the predictive effect of early attachment related parenting on child conduct and emotional adjustment. The larger objective of this thesis was to compare these parenting practices with those drawing on social learning theory. Analyses in research question 3 will examine parental warmth simultaneously with parental effective management. This will provide unique effects of these dimensions of parenting and thereby a direct comparison between these parenting practices can be made.

Figure 5.1.1a: Theoretical SEM model for research question 1: parental warmth age 2-3 predicting child externalising and internalising at age 3, 4, 5, and 7.5

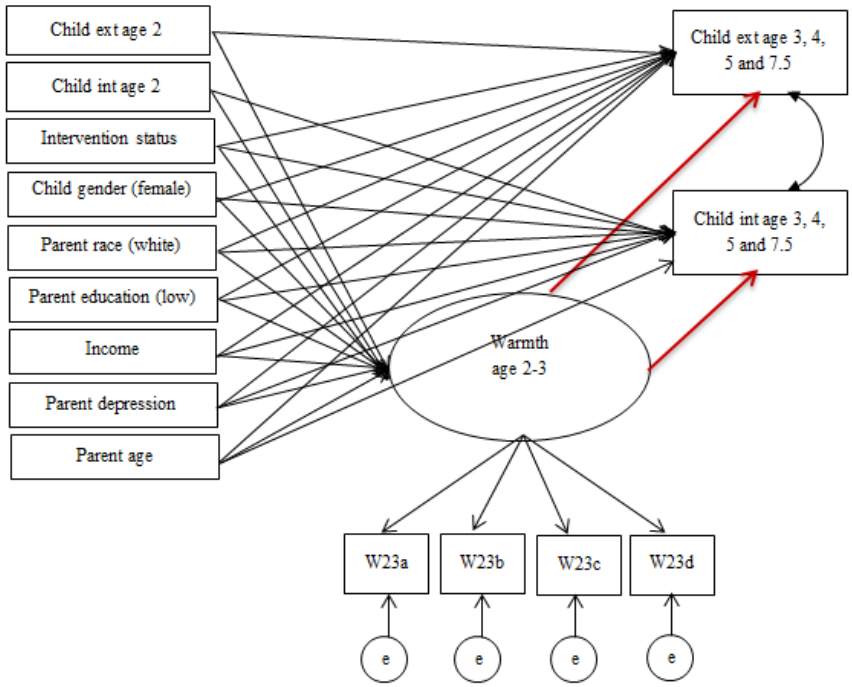
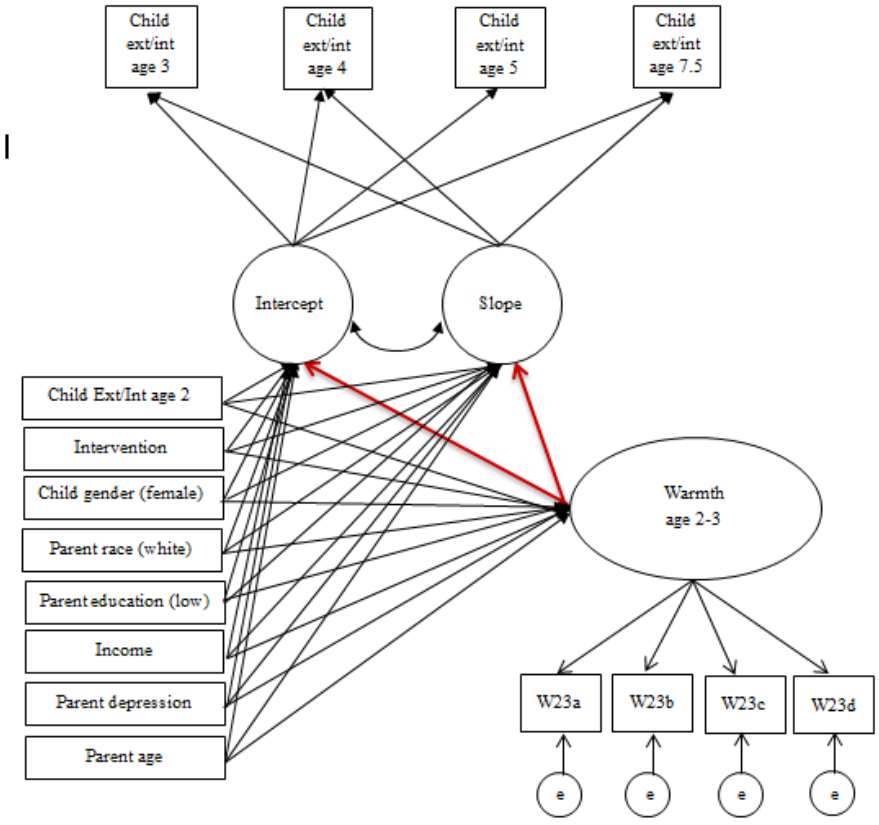


Figure 5.1.1b: Theoretical LGCM model for research question 1: parental warmth age 2-3 predicting externalising and internalising trajectories from age 3 to 7.5



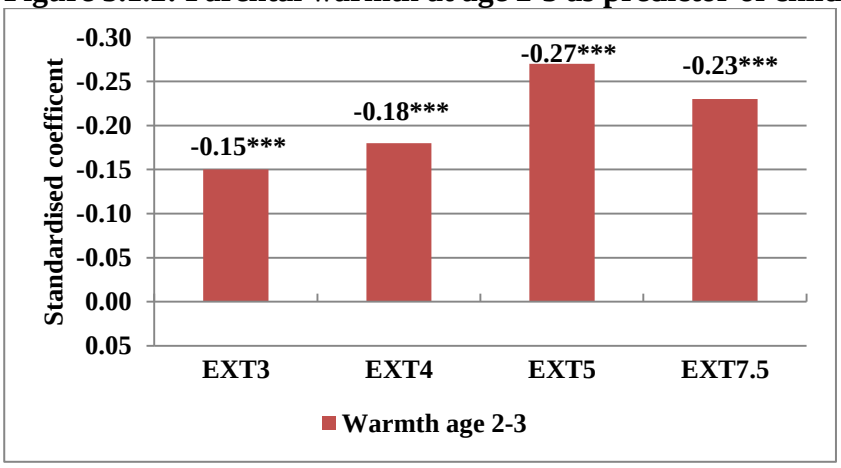
Notes: Externalising and internalising trajectories outcomes were analysed in separate models.

Table 5.1.1: Parental warmth at age 2-3 as predictor of child externalising and internalising at age 3, 4, 5 and 7.5

	Warmth age 2-3		
Child outcome	**B**	**S.E**	**β**
Externalising age 3	-1.31	0.33	**-.15*** **
Externalising age 4	-1.71	0.40	**-.18*** **
Externalising age 5	-2.47	0.40	**-.27*** **
Externalising age 7.5	-2.43	0.50	**-.23*** **
Internalising age 3	-0.77	0.29	**-.09***
Internalising age 4	-0.77	0.31	**-.10***
Internalising age 5	-0.76	0.28	**-.13****
Internalising age 7.5	-1.23	0.39	**-.16****

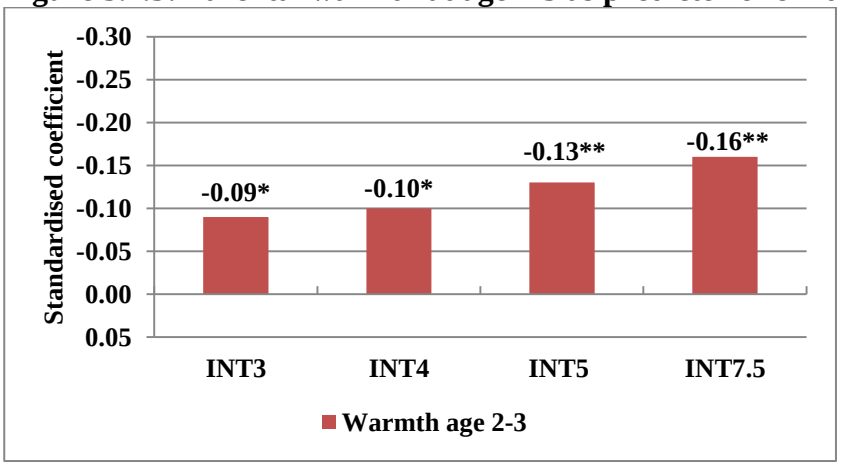
Notes: Figures are regression coefficients from structural equation models (See Figures 5.1.4 to 5.1.7, Appendix D). Control variables in models are: child behaviour age 2, intervention group, gender of child, parent race, parent education, income, parent depression, parent age. $^{+}$p<.10, *p<.05, ** p<.01, ***p<.001

Figure 5.1.2: Parental warmth at age 2-3 as predictor of child <u>externalising</u> age 3 to 7.5



Notes: Control variables in models are: child behaviour age 2, intervention group, gender of child, parent race, parent education, income, parent depression, parent age. *p<.05, **p<.01, ***p<.001

Figure 5.1.3: Parental warmth at age 2-3 as predictor of child <u>internalising</u> age 3 to 7.5



Notes: Control variables in models are: child behaviour age 2, intervention group, gender of child, parent race, parent education, income, parent depression, parent age. *p<.05, **p<.01, ***p<.001

Table 5.1.2: Parental warmth at age 2-3 predicting trajectories of child externalising age 3 to 7.5

Predictor variables	Unstandardised estimate (B)	Standard error (SE)	Standardised estimate (β)
Effect on the intercept			
Externalising age 2	0.62	0.04	**.60*** **
Intervention status	- 0.80	0.50	- .05
Child gender (female)	- 0.13	0.07	- .06^{+}
Parent race (white)	0.58	0.52	.04
Parent education (low)	0.94	0.59	.05
Income	- 0.06	0.13	- .02
Parent depression	0.11	0.02	**.15*** **
Parent age	0.06	0.04	.06
Warmth	- 1.24	0.33	**- .15*** **
Effect on slope			
Externalising age 2	- 0.03	0.01	**- .20*** **
Intervention status	- 0.09	0.13	- .04
Child gender (female)	0.006	0.018	.02
Parent race (white)	- 0.01	0.13	- .004
Parent education (low)	- 0.15	0.15	- .05
Income	0.018	0.030	.03
Parent depression	- 0.001	0.006	- .008
Parent age	0.014	0.012	.08
Warmth	- 0.26	0.09	**- .20** **
Intercept and slope correlation	- 2.48	0.96	**- .41*** **
Intercept R^2 =.48***			
Slope R^2 =.08*			
Model fit: RMSEA = .000; CFI = 1.000; TLI = 1.001; WRMR = .545			
Ratio of observations to free parameters: 685:49 = 14:1.			
Notes: $^{+}$p<.10, *p<.05, ** p<.01, ***p<.001			

Table 5.1.3: Parental warmth at age 2-3 predicting trajectories of child <u>internalising</u> age 3 to 7.5

Predictor variables	Unstandardised estimate (B)	Standard error (SE)	Standardised estimate (β)
Effect on the intercept			
Internalising age 2	0.71	0.03	**.69*** **
Intervention status	- 0.81	0.43	- .06^{+}
Child gender (female)	0.004	0.061	.00
Parent race (white)	0.42	0.44	.03
Parent education (low)	0.43	0.50	.03
Income	0.001	0.113	.00
Parent depression	0.07	0.02	**.12*** **
Parent age	- 0.008	0.034	- .01
Warmth	- 0.72	0.28	**- .10***
Effect on slope			
Internalising age 2	- 0.09	0.01	**- .55*** **
Intervention status	0.02	0.10	.01
Child gender (female)	0.02	0.01	.08^{+}
Parent race (white)	0.10	0.11	.05
Parent education (low)	- 0.15	0.12	- .06
Income	0.007	0.026	.01
Parent depression	0.000	0.005	.005
Parent age	0.02	0.01	.10^{+}
Warmth	- 0.03	0.07	- .03
Intercept and slope correlation	- 2.04	0.45	**- .56*** **
Intercept R^2 =.57***			
Slope R^2 =.34***			
Model fit: RMSEA = .025; CFI = .987; TLI = .980; WRMR = .706			
Ratio of observations to free parameters: 685:49 = 14:1.			
Notes: $^{+}$p<.10, *p<.05, ** p<.01, ***p<.001			

5.2. Results of research question 2: Does early parental effective management (age 2-3) predict child externalising and internalising behaviour at age 3, 4, 5 and 7.5?

This research question tests social learning theory (Gardner, 1987; Patterson, 1982) as an explanatory framework for linking parenting practices with child behavioural and emotional functioning. It was hypothesised that early parenting related to social learning, 'effective management', at age 2-3, would predict lower levels of child externalising and internalising problems at age 3, 4, 5 and 7.5.

5.2.1. SEM models: effective management at age 2-3 predicting externalising and internalising at age 3, 4, 5 and 7.5

The theoretical SEM model for the examination of early effective management as a predictor of child externalising and internalising outcomes at each time point is shown in Figure 5.2.1a. A model was run for each respective age (age 3, 4, 5 and 7.5), with externalising and internalising entered simultaneously and allowed to covary. The results of these analyses are reported in Figures 5.2.4 to 5.2.7 (Appendix D), where all significant paths are shown. All models demonstrated a good fit with the data (RMSEA <.05; CFI and TLC >.95; SRMR <.08). Table 5.2.1 below provides a summary of the unstandardised (B) standardised coefficients (β) between effective management at age 2-3 and child outcomes in each of the models. Figures 5.2.2 and 5.2.3 illustrate the standardised coefficients graphically for child externalising and internalising, respectively.

It was found that over and above previous child behaviour and effects of covariates, higher levels of early parental effective management at age 2-3 were significantly associated with lower levels of externalising problems at all child ages from 3 to 7.5 (range: $\beta = -.12$, $p < .05$ to $\beta = -.19$, $p < .001$), and to lower internalising problems at age 3 ($\beta = -.16$, $p < .001$), age

4 (β = -.13, p <.01), and at age 7.5 (β = -.10, p <.05), but not at age 5. At each child age, effective management was a stronger predictor of child conduct problems than of emotional problems. The strength of the relationship between effective management and child externalising and internalising seemed to change over time, which is best illustrated in Figures 5.2.2 and 5.2.3. These show that associations between this parenting variable and child outcomes declined slightly from age 3 through to age 7.5, suggesting that the magnitude of the predictive effect of early effective management on child functioning attenuated with time. This pattern was examined further in the following analysis that tested parental effective management as a predictor of change in child functioning across time.

5.2.2. Conditional LGCM models: effective management at age 2-3 predicting externalising and internalising trajectories age 3 to 7.5

Conditional latent growth curve models (LGCMs) examined early effective management at age 2-3 as a predictor of child trajectories of externalising and internalising problems from age 3 to age 7.5. This theoretical model is shown in Figure 5.2.1b. Externalising and internalising trajectories were analysed in separate models. As reported previously in the preliminary analyses that examined the unconditional LGCMs, both child externalising and internalising problems showed a pattern of decrease over time from age 3 to 7.5.

5.2.2.1. Externalising trajectories

Results of the conditional growth model for child externalising are presented in Table 5.2.2 below, whilst results of the full model can be inspected in Figure 5.2.8 (Appendix D). The overall model provided a very good fit to the data (RMSEA = .011; CFI = 0.998; TLI = 0.997; SRMR = .018). Results showed that the intercept, which is the initial levels of child externalising at age 3, was predicted by effective management at age 2-3, whereby higher

levels of this dimension of parenting predicted lower initial levels of externalising symptoms (β = -.20, p<.001). As for the slope, or the rate of decline of child externalising from age 3 through to age 7.5, effective management was not a significant predictor. Higher levels of externalising at age 2 were associated with a steeper decrease over time in these child problems (β = -.18, p<.01), and there was also a negative correlation between the intercept and slope (β = -.23, p<.01), indicating that children with more initial externalising problems at toddler age tended to decrease their symptoms more rapidly through to early school age.

5.2.2.2. Internalising trajectories

Results of the conditional model for internalising trajectories are reported in Table 5.2.3 below and the full model is in Figure 5.2.9 (Appendix D). The fit of the model was good (RMSEA = .026; CFI = 0.986; TLI = 0.978; SRMR = .023). The intercept (internalising at age 3) was negatively related to parent effective management at age 2-3 (β = -.18, p<.001), which means that higher levels of this aspect of parenting were associated with lower initial child internalising symptoms. However, in terms of change over time, the slope was positively related to effective management (β = .22, p<.01), which means that those children whose parents scored higher on effective management at age 2-3 experienced a slower decrease in their internalising symptoms from age 3 to age 7.5. Results also showed that children with higher levels of internalising problems at age 2, tended to decrease their problems at a faster rate (β = -.49, p<.001), and similarly, the negative correlation between the intercept and slope indicated that elevated internalising problems at age 3 were associated with a steeper reduction in child symptoms during the developmental period through to age 7.5 (β = -.40, p<.001).

5.2.3. Conclusion

Results are mostly supportive of the hypothesis that higher levels of early parenting associated with social learning ('effective management') at age 2-3 were predictive of lower levels of externalising and internalising problems at age 3, 4, 5 and 7.5. For child externalising behaviour there were significant effects of this aspect of parenting at all individual assessment points. Effects appeared to decrease slightly for later child ages, although trajectory analysis showed that effective management did not significantly predict a slower rate of change in child externalising problems across time beyond its prediction of lower initial levels of these child problems at age 3. Results therefore indicate that there are relatively consistent effects of this parenting dimension on lower child externalising problems from toddler age through to early school age. In term of child internalising outcomes, effective management predicted lower levels of child symptoms at all measurement points, except at age 5. In terms of the pattern over time, although early effective management was predictive of lower initial levels of child internalising problems at 3, it predicted a slower decrease in child problems through to age 7.5, meaning that effects on child emotional functioning may not be enduring.

The investigations reported here are initial analyses of early parenting associated with social learning as a predictor of child outcomes. However, the main purpose of this thesis was to compare theoretical parenting practices from attachment theory and social learning theory. Therefore the analyses in relation to the next research question will examine the theoretical parenting dimensions warmth and effective management simultaneously. This will offer a direct comparison between these parenting dimensions in terms of their respective unique predictive effects on child adjustment.

Figure 5.2.1a: Theoretical SEM model for research question 2: parental effective management age 2-3 predicting child externalising and internalising at age 3, 4, 5 and 7.5

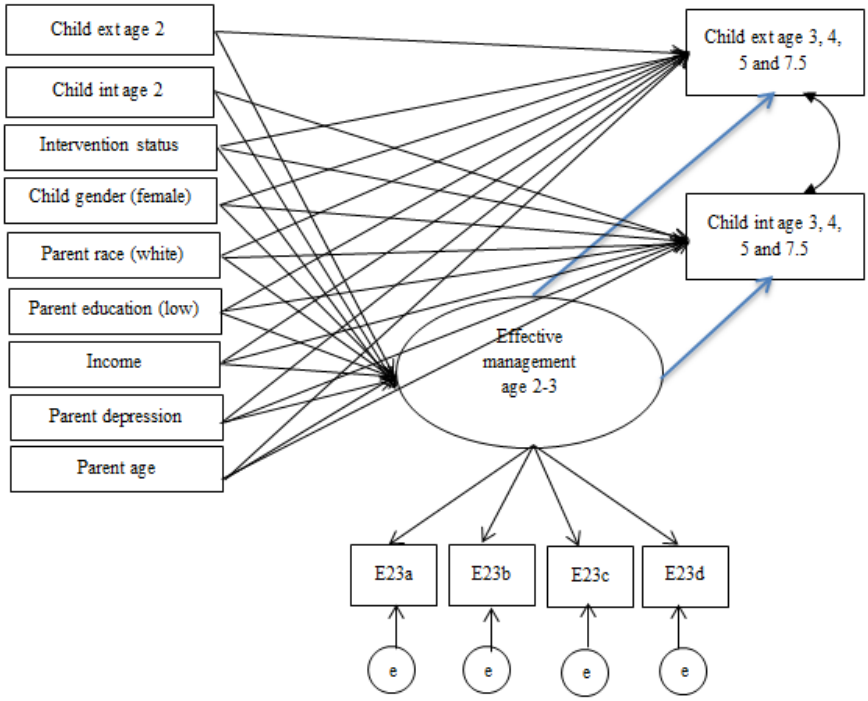
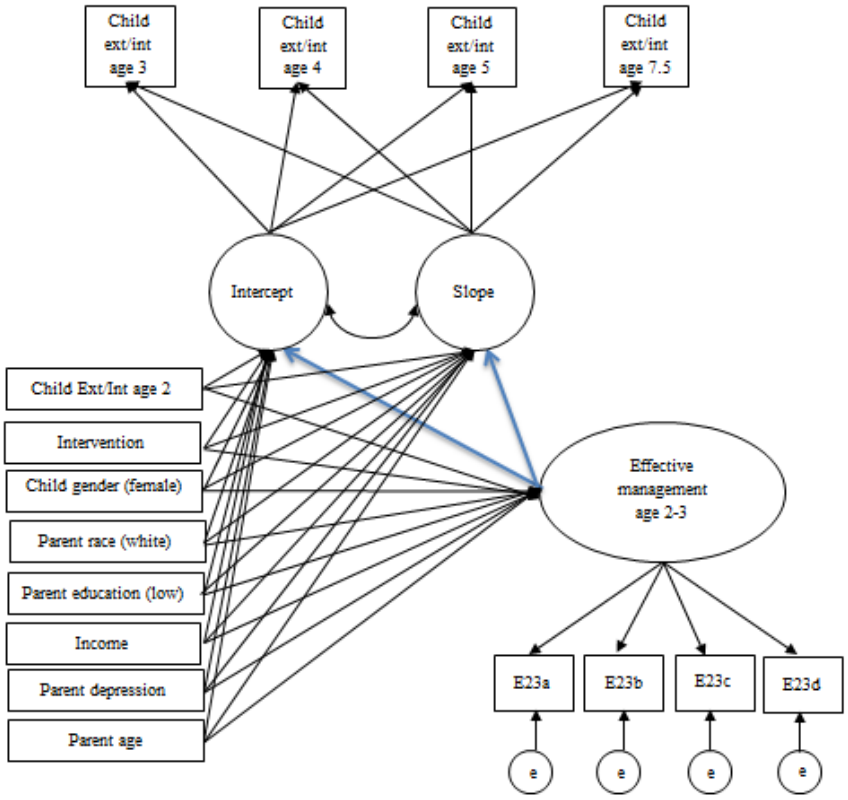


Figure 5.2.1b: Theoretical LGCM model for research question 2: parental effective management predicting child externalising and internalising trajectories from age 3 to 7.5



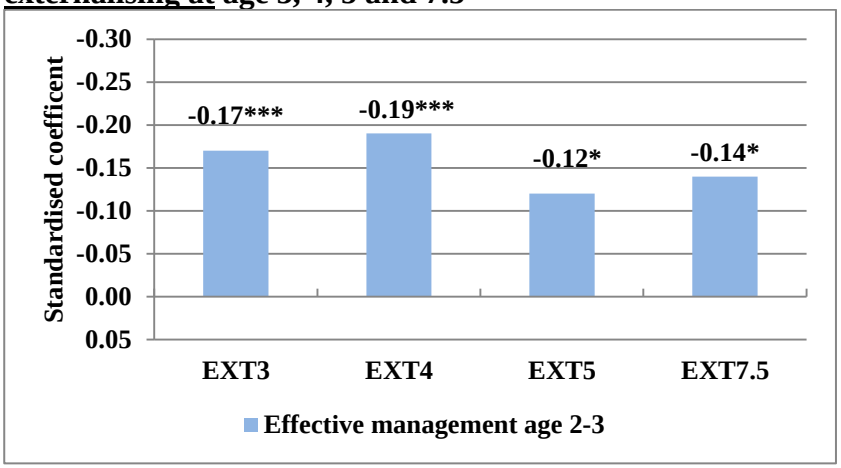
Notes: Externalising and internalising trajectories outcomes are analysed in separate models.

Table 5.2.1: Parental effective management at age 2-3 as predictor of child externalising and internalising age 3, 4, 5 and 7.5

Child outcome	Effective management age 2-3		
	B	S.E	β
Externalising age 3	-1.74	0.39	**-.17*** **
Externalising age 4	-2.07	0.47	**-.19*** **
Externalising age 5	-1.28	0.51	**-.12** **
Externalising age 7.5	-1.66	0.61	**-.14** **
Internalising age 3	-1.49	0.35	**-.16*** **
Internalising age 4	-1.15	0.44	**-.13** **
Internalising age 5	-0.08	0.31	-.01
Internalising age 7.5	-0.87	0.44	**-.10***

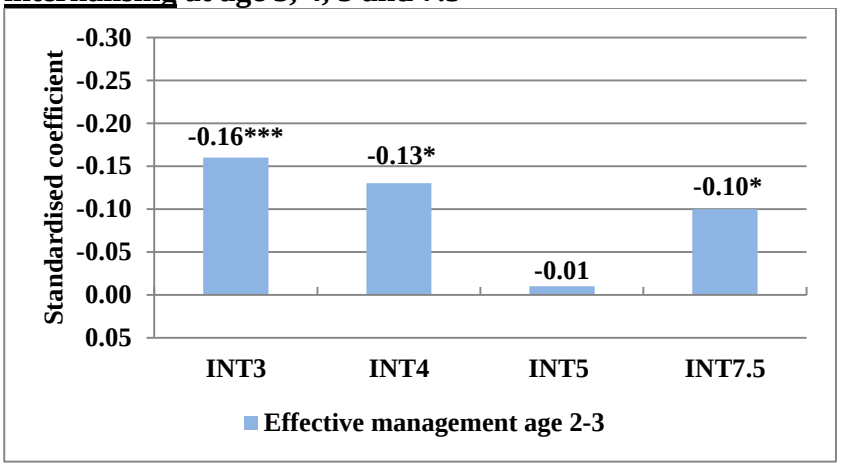
Notes: Figures are regression coefficients from structural equation models (See Figures 5.2.4 to 5.2.7, Appendix D). Control variables in models are: child behaviour age 2, intervention group, gender of child, parent race, parent education, income, parent depression, parent age. $^{+}$p<.10, *p<.05, ** p<.01, ***p<.001

Figure 5.2.2: Parental effective management at age 2-3 as predictor of child externalising at age 3, 4, 5 and 7.5



Notes: Control variables in models are: child behaviour age 2, intervention group, gender of child, parent race, parent education, income, parent depression, parent age. *p<.05, **p<.01, ***p<.001

Figure 5.2.3: Parental effective management at age 2-3 as predictor of child internalising at age 3, 4, 5 and 7.5



Notes: Control variables in models are: child behaviour age 2, intervention group, gender of child, parent race, parent education, income, parent depression, parent age. *p<.05, **p<.01, ***p<.001

Table 5.2.2: Parental effective management age 2-3 predicting trajectories of child externalising age 3 to 7.5

Predictor variables	Unstandardised estimate (B)	Standard error (SE)	Standardised estimate (β)
Effect on the intercept			
Externalising age 2	0.61	0.04	**.61*** **
Intervention status	- 0.57	0.48	- .04
Child gender (female)	- 0.11	0.07	- .05
Parent race (white)	0.16	0.50	.01
Parent education (low)	0.57	0.62	.03
Income	- 0.05	0.11	- .01
Parent depression	0.11	0.02	**.16*** **
Parent age	0.04	0.04	.04
Effective management	- 1.87	0.38	**- .20*** **
Effect on slope			
Externalising age 2	- 0.03	0.01	**- .18** **
Intervention status	- 0.06	0.11	- .03
Child gender (female)	0.01	0.02	.03
Parent race (white)	- 0.06	0.12	- .03
Parent education (low)	- 0.01	0.14	- .002
Income	0.01	0.04	.03
Parent depression	- 0.001	0.006	.005
Parent age	0.01	0.01	.04
Effective management	0.12	0.08	.10
Intercept and slope correlation	- 1.11	0.54	**- .23** **
Intercept R^2 =.53***			
Slope R^2 =.07*			
Model fit: RMSEA = .011; CFI = .998; TLI = .997; SRMR = .018			
Ratio of observations to free parameters: 685:49 = 14:1			
Notes: $^{+}$p<.10, *p<.05, ** p<.01, ***p<.001			

Table 5.2.3: Parental effecting management age 2-3 predicting trajectories of child internalising age 3 to 7.5

Predictor variables	Unstandardised estimate (B)	Standard error (SE)	Standardised estimate (β)
Effect on the intercept			
Internalising age 2	0.65	0.04	**.68*** **
Intervention status	- 0.65	0.40	- .05
Child gender (female)	0.04	0.06	.02
Parent race (white)	0.18	0.42	.01
Parent education (low)	0.15	0.57	.01
Income	0.00	0.09	.00
Parent depression	0.07	0.02	**.12****
Parent age	- 0.01	0.03	- .01
Effective management	- 1.44	0.34	**- .18*** **
Effect on slope			
Internalising age 2	- 0.06	0.01	**- .49*** **
Intervention status	- 0.01	0.07	- .01
Child gender (female)	0.02	0.01	.07
Parent race (white)	0.06	0.07	.04
Parent education (low)	- 0.07	0.10	- .04
Income	0.01	0.02	.02
Parent depression	0.00	0.00	.00
Parent age	0.04	0.01	.04
Effective management	0.21	0.06	**.22****
Intercept and slope correlation	- 0.93	0.31	**- .40*** **
Intercept R^2 =.59***			
Slope R^2 =.35***			
Model fit: RMSEA = .026; CFI = .986; TLI = .978; SRMR = .023			
Ratio of observations to free parameters: 685:49 = 14:1			
Notes: $^{+}$p<.10, *p<.05, ** p<.01, ***p<.001			

5.3. Results of research question 3: Do both early parental warmth and early effective management (age 2-3) predict child externalising and internalising behaviour at age 3, 4, 5 and 7.5, and do these parenting dimensions interact over and above their additive effects in predicting these child outcomes?

This research question tests the hypothesis that parenting related to attachment theory (Bowlby, 1958, 1988; Ainsworth et al., 1978) and to social learning theory (Gardner, 1987; Patterson, 1982) are both predictive of child behavioural and emotional functioning. It was hypothesised that both warmth and effective management at age 2-3 would be independently associated with lower child externalising and internalising problems at age 3, 4, 5, and 7.5. The hypothesis was also tested that an interaction between the two dimensions of parenting is associated with enhanced child functioning, as proposed by Baumrind (1966, 1967) who identified the authoritative parenting type as optimal for child functioning, and as suggested in the motivational model formulated by Richters and Waters (1991).

5.3.1. SEM models: warmth and effective management at age 2-3 predicting externalising and internalising at age 3, 4, 5 and 7.5

The hypothesised structural equation models with both theoretical parenting dimensions as simultaneous predictors of child externalising and internalising at each respective assessment point at age 3, 4, 5, and 7.5, is illustrated in Figure 5.3.1a. Parenting measures ‘warmth’ and ‘effective management’ were included simultaneously, and also the interaction between these two latent parenting variables was modelled to predict child outcomes. A model was run for each respective child assessment point, with externalising and internalising modelled simultaneously and allowed to covary. First, models were run without the interaction to

assess just the main effects of the two latent parenting variables, and then models were run adding the interaction term as a predictor of child outcomes. This two-step procedure is the latent moderated structural equation method (LMS), which is recommended for the testing of interaction effect in MPlus as described previously in the methods chapter. Results of analyses are presented in Figures 5.3.4 to 5.3.7 (Appendix D) that show all significant paths in models. All models demonstrated good fit with the data (RMSEA <.05; CFI and TLC >.95; SRMR <.08). Table 5.3.1 provides a summary of this series of models in term of the estimated coefficients for the main effects of the relationship of the two theoretical parenting constructs to child externalising and internalising outcomes. Table 5.3.2 shows results of the interaction between parental warmth and effective management as a predictor of child problems. Graphical illustrations of standardised coefficients are shown in Figure 5.3.2 for externalising, and in Figure 5.3.3 for internalising outcomes. First, the results of main effects are presented and then the interaction analyses are reported.

5.3.1.1. Main effects of warmth age 2-3

Reported in Table 5.3.1 and Figure 5.3.2 are results showing that, independent of effective management and covariates, early parental warmth at age 2-3 was associated with lower child externalising at age 4 (β = -.11, p <.05), at age 5 (β = -.26, p <.001), and at age 7.5 (β = -.23, p <.001). So whilst early parental warmth did not predict child externalising concurrently at age 3, the effect of this parenting aspect became apparent by age 4 where the effect was small, but it then became more pronounced at later child ages, at age 5 and 7.5. A similar pattern was found with regards to the association between early warmth and child internalising (Table 5.3.1 and Figure 5.3.3). No relationship was found between warmth at age 2-3 and internalising at age 3 and 4, but there was a significant association later at age 5 (β = -.15, p <.01) and at age 7.5 (β = -.16, p <.05). In all models, the strength of the

association between warmth and children's outcomes was stronger for externalising than for internalising problems.

5.3.1.2. Main effects of effective management age 2-3

As for the predictive effect of early parental effective management (Table 5.3.1 and Figure 5.3.2), results showed that, independent of early warmth and covariates, higher levels of early effective management at age 2-3 were significantly related to lower child externalising at age 3 (β = -.14, p <.01) and at age 4 (β = -.15, p <.01), but at age 5 and age 7.5 there was no association. Higher levels of effective management (Table 5.3.1 and Figure 5.3.3) were also related to lower levels of child internalising at age 3 (β = -.15, p <.01), but later child internalising outcomes were not predicted by this aspect of early parenting. Therefore parental effective management seemed to predict externalising and internalising outcomes only relatively short-term. In the LGCM analyses further below, the effects across time were tested more formally.

5.3.1.3. Interaction effect of warmth and effective management age 2-3

Results of models with the interaction between the two early parenting constructs at age 2-3 as an additional predictor are shown in Table 5.3.2. This showed that the interaction term had no significant association with any of the child outcomes examined.

5.3.2. Conditional LGCM models: warmth and effective management at age 2-3 predicting externalising and internalising trajectories age 3 to 7.5

Conditional latent growth curve models (LGCMs) examined early warmth and effective management at age 2-3 as simultaneous predictors of trajectories of child externalising and internalising problems from age 3 to age 7.5. The interaction between the parenting

constructs was also examined using the LMS approach as in the SEMs above. The theoretical LGCM is illustrated in Figure 5.3.1b. Externalising and internalising are here shown in the same theoretical model, although these were analysed separately. As reported in the preliminary analyses that examined the unconditional LGCMs, both child externalising and internalising problems reduced over time from age 3 to 7.5 in this sample of children.

5.3.2.1. Externalising trajectories

Results of the conditional model for externalising trajectories are reported in Table 5.3.3, and results of the full model are in Figure 5.3.8 (Appendix D). The model provided a good fit with the data (RMSEA = .012; CFI = .996; TLI = .994; SRMR = .023).

In terms of early parental warmth at age 2-3 and child externalising, independent of early effective management and covariates, higher warmth was not predictive of the intercept, i.e. initial child internalising problems at age 3 (β = -0.08 $p<.10$), but it predicted a steeper decrease in child externalising symptoms through to 7.5 (β = -0.29 $p<.01$). As for early effective management at age 2-3, this showed a unique effect (independent of warmth and covariates) on the intercept, in the direction that higher levels of effective management predicted lower starting levels of child externalising problems at age 3 (β = -0.17 $p<.001$). However, this aspect of parenting then predicted a *slower* reduction in child externalising symptoms through to age 7.5 (β = 0.23 $p<.01$). There was no effect of the interaction between the two theoretical parenting dimensions on the intercept or on the slope of child externalising trajectories.

Results also showed that children with higher levels of externalising at age 2 experienced a steeper decrease in symptoms (β = -.18, $p<.01$), and likewise the negative correlation between the intercept and slope (β = -.26, $p<.001$) signified that higher

externalising problems at age 3 were related to symptoms declining more rapidly through to age 7.5.

5.3.2.2 Internalising trajectories

As for child internalising trajectories from age 3 to 7.5, the results of the conditional growth model with early warmth and effective management modelled simultaneously as predictors are shown in Table 5.3.4. The full model that shows all significant paths is in Figure 5.3.9 (Appendix D). The fit of the model was good according to multiple fit indices (RMSEA = .023; CFI = .984; TLI = .977; SRMR = .026).

Results showed that early warmth at age 2-3 was not a significant predictor of the intercept (child internalising at age 3), and nor was it or predictive of the slope (decrease in child internalising from age 3 to 7.5). In terms of early effective management at age 2-3, this predicted lower initial levels of child internalising symptoms (β = -0.16 $p<.001$), however it was predictive of a significantly slower decrease in child symptoms from age 3 to 7.5 (β = 0.25 $p<.001$).

The interaction analysis showed that there was no effect of an interaction between early warmth and effective management at age 2-3 that predicted the intercept of child internalising problems, although over time it predicted a more rapid reduction in internalising problems (β = -0.17 $p<.05$). This means that higher levels of effective management in the context of higher warmth contributed to a steeper decline in child internalising symptoms.

Other predictor variables of the slope included age 2 internalising (β = -.50, $p<.001$), and age 3 internalising (intercept and slope correlation, β = -.41, $p<.001$), which means that those children with more initial problems tended to reduce their symptoms faster through to age 7.5.

5.3.3. Conclusion

In these investigations, aspects of early parenting at age 2-3 related to attachment theory ('warmth') and to social learning theory ('effective management') were examined simultaneously, and thereby their unique and independent effects on child functioning at age 3, 4, 5 and 7.5 could be studied and compared. Overall findings showed that these parenting dimensions predicted child outcomes at different child ages, and therefore results are only partially supportive of the hypothesis that both early parental warmth and effective management predict child outcomes.

Higher levels of early effective management at age 2-3 predicted lower levels of child problems only in the short-term, for externalising at age 3 and 4, and for internalising at age 3. In in the longer-term, when children reached early school age at age 5 and 7.5, effective management had no effect on externalising or internalising. As suggested by results of the trajectory analyses that examined the development of child functioning over time, effective management predicted a slower decrease in both externalising and internalising symptoms. Overall, these results suggest that early effective management is not a conducive parental strategy for protecting children from adjustment problems in the longer-term.

As for parental warmth, quite a different pattern was shown. Early parental warmth at age 2-3 was unrelated to child externalising at age 3, and to internalising at age 3 and 4, but over time warmth became predictive by showing prediction of more distal child functioning at age 5 and 7.5. In terms of the development of child problems across time, trajectory analyses indicated that higher levels of warmth at age 2-3 predicted a more rapid decrease in externalising problems from age 3 through to age 7.5. Early parental warmth therefore seems to be a promising parental strategy for inducing long-term child functioning.

These findings suggest that there may be what Kagan and Moss (1962) referred to as 'sleeper effects' of parental warmth on child adjustment. However, one of the challenges of

the concept of sleeper effects is the possibility of an intervening variable (Clarke & Clarke, 1981) whereby early parenting practices may be associated with later child outcome because they correlated with later parenting behaviours that are more causally related to child outcomes than early parenting. In this study this may be especially applicable because of the high continuity of parental warmth between age 2-3 and age 5, whereas the continuity was lower for effective management. In research questions 5 to 7 there will be a more thorough examination of how parenting at age 5 contribute to child conduct and emotional problems. Analyses will be run with early and later parenting as simultaneous predictors of child outcomes, with repeated measures of parenting and child outcomes entered in autoregressive models that provide a more comprehensive check of sleeper effects.

Another conclusion based on the current findings, is that there was only partial support for the hypothesis that the two parenting dimensions at age 2-3 interact in predicting child adjustment (Baumrind, 1966, 1967; Richters & Waters, 1991). The analyses of individual assessment points showed little evidence that being a warm parent and at the same time being an effective manager was of further benefit to children's behavioural and emotional functioning in addition to the main effects of these two parenting dimensions. However, the trajectory analyses that investigated the change in child functioning over time showed that warmth coupled with effective management predicted a faster decrease in children's internalising symptoms but not externalising. Next in research question 4 it will be investigated if *early* warmth and *later* effective management interact in predicting child functioning as proposed in Shaw and Bell's (1993) child developmental 'bridging model', which links attachment theory and social learning theory.

Figure 5.3.1a: Theoretical SEM model for research question 3: parental warmth and effective management age 2-3 predicting externalising and internalising at age 3, 4, 5 and 7.5

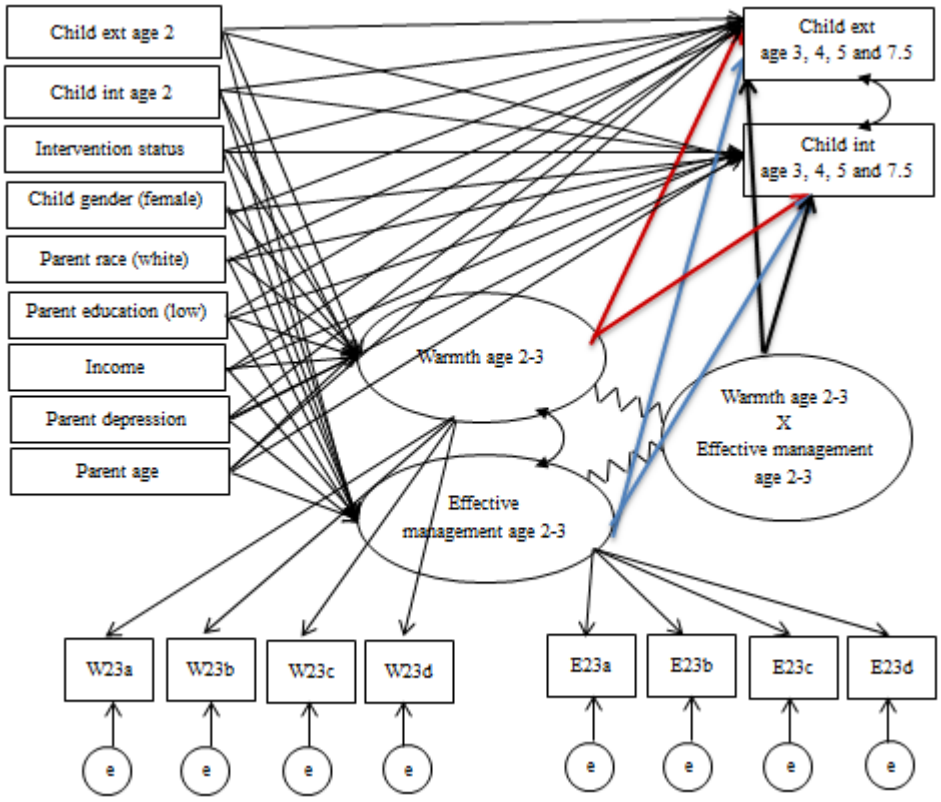
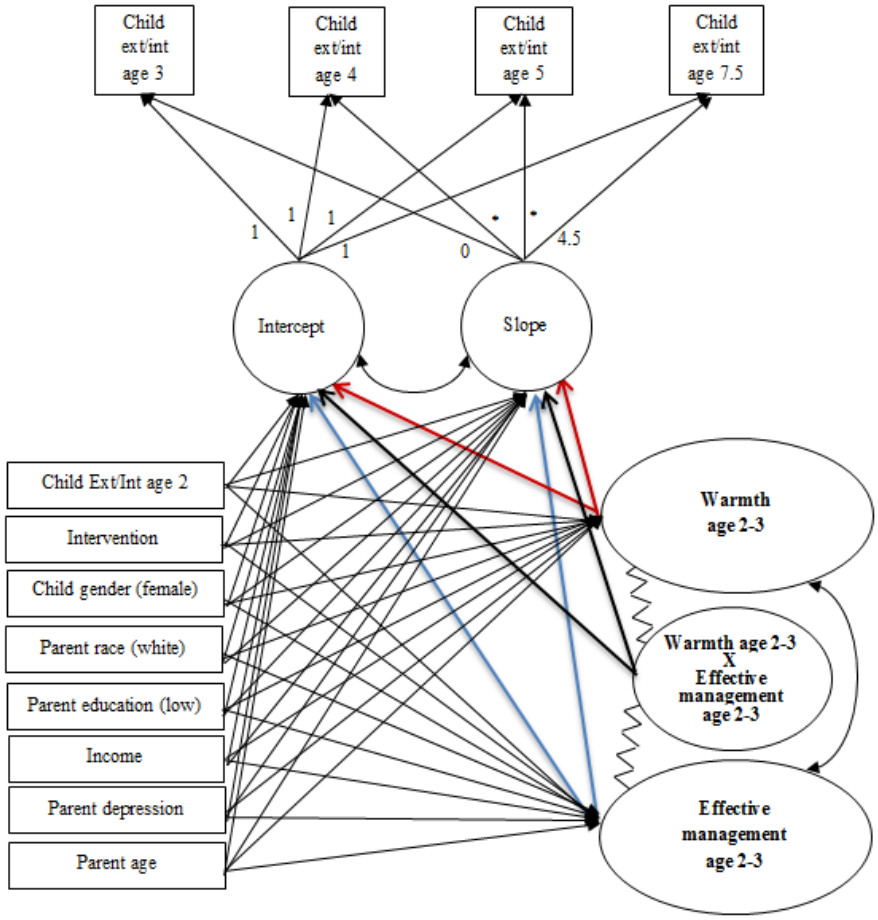


Figure 5.3.1b: Theoretical LGCM model for research question 3: parental warmth and effective management at age 2-3 as predictors of externalising and internalising trajectories from age 3 to 7.5



Notes: 1) Indicators for latent parenting variables warmth and effective management are not shown; see CFA in chapter 4 for details. (2)Externalising and internalising trajectories outcomes are analysed in separate models.

Table 5.3.1: Main effects of parental warmth and parent effective management at age 2-3 as predictors of child externalising and internalising at age 3, 4, 5 and 7.5

Child outcome	Warmth age 2-3			Effective management age 2-3		
	B	S.E	β	B	S.E	β
Externalising age 3	-2.09	1.16	-.08	-1.40	0.44	**-.14****
Externalising age 4	-3.05	1.47	**-.11***	-1.62	0.57	**-.15****
Externalising age 5	-6.80	1.67	**-.26*****	-0.03	0.59	-.01
Externalising age 7.5	-6.82	1.93	**-.23*****	-0.44	0.71	-.04
Internalising age 3	-0.58	1.00	-.03	-1.36	0.40	**-.15****
Internalising age 4	-1.29	1.22	-.06	-0.92	0.50	-.10
Internalising age 5	-2.46	0.99	**-.15****	0.31	0.38	. 05
Internalising age 7.5	-3.56	1.57	**-.16***	-0.27	0.55	-.03

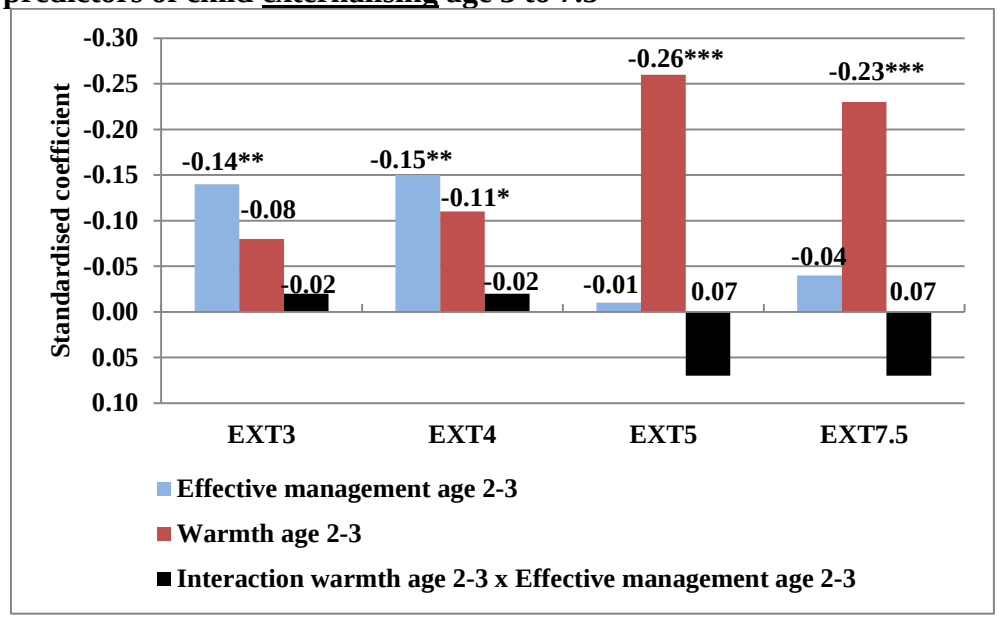
Notes: Figures are regression coefficients from structural equation models (See Figures 5.3.4 to 5.3.7, Appendix D). Control variables in models are: child behaviour age 2, intervention group, gender of child, parent race, parent education, income, parent depression, parent age. $^{+}$p<.10, *p<.05, ** p<.01, ***p<.001

Table 5.3.2: Interaction effects between parental warmth and parent effective management at age 2-3 as predictor of child externalising and internalising at age 3, 4, 5 and 7.5

Child outcome	Warmth age 2-3 X Effective management age 2-3		
	B	S.E	β
Externalising age 3	-0.01	1.15	-.02
Externalising age 4	-0.22	1.14	-.02
Externalising age 5	0.93	2.38	.07
Externalising age 7.5	1.29	2.17	.07
Internalising age 3	0.65	0.94	.08
Internalising age 4	0.37	1.55	.04
Internalising age 5	-1.31	0.97	$-.14^{+}$
Internalising age 7.5	-0.86	1.31	-.06

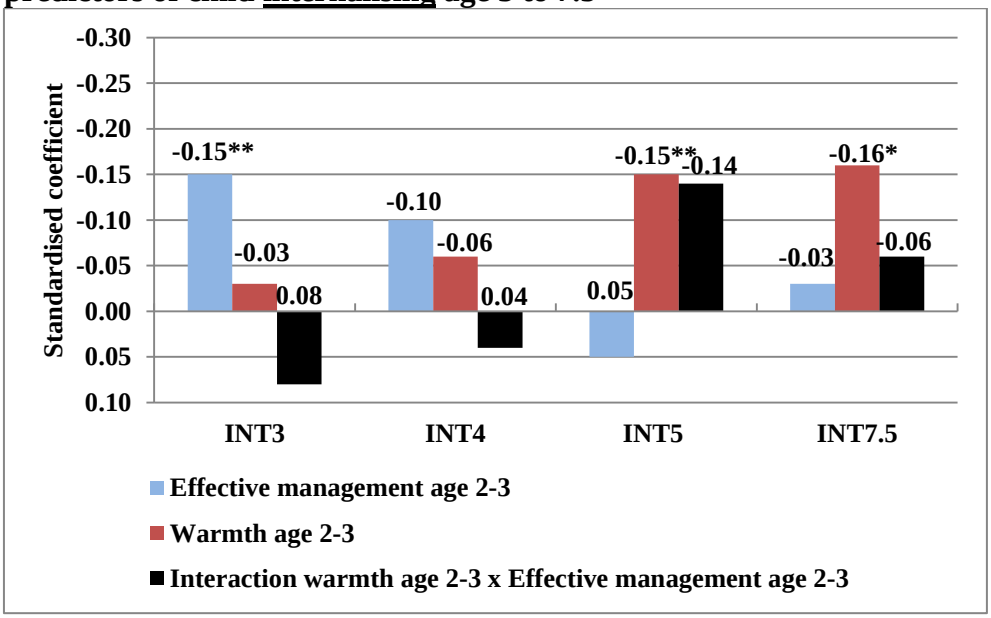
Notes: Figures are regression coefficients from structural equation models (See Figures 5.3.4 to 5.3.7, Appendix D). Control variables in models are: child behaviour age 2, intervention group, gender of child, parent race, parent education, income, parent depression, parent age. $^{+}$p<.10, *p<.05, ** p<.01, ***p<.001.

Figure 5.3.2: Parental warmth and parent effective management at age 2-3 as predictors of child externalising age 3 to 7.5



Notes: Control variables in models are: child behaviour age 2, intervention group, gender of child, parent race, parent education, income, parent depression, parent age. *p<.05, **p<.01, ***p<.001

Figure 5.3.3: Parental warmth and parent effective management at age 2-3 as predictors of child internalising age 3 to 7.5



Notes: Control variables in models are: child behaviour age 2, intervention group, gender of child, parent race, parent education, income, parent depression, parent age. *p<.05, **p<.01, ***p<.001

Table 5.3.3: Parental warmth and effective management at age 2-3 predicting trajectories of child externalising age 3 to 7.5

Predictor variables	Unstandardised estimate (B)	Standard error (SE)	Standardised estimate (β)
Effect on the intercept			
Externalising age 2	0.60	0.04	**.60*** **
Intervention status	- 0.62	0.48	- .04
Child gender (female)	- 0.11	0.07	- .05
Parent race (white)	0.33	0.50	.02
Parent education (low)	0.59	0.61	.03
Income	- 0.04	0.11	- .01
Parent depression	0.10	0.02	**.15*** **
Parent age	0.06	0.04	.05
Warmth	- 1.89	1.13	- .08^{+}
Effective management	- 1.57	0.44	**- .17*** **
Warmth X Effective management [a]	-0.01	1.08	- .01
Effect on slope			
Externalising age 2	- 0.03	0.01	**- .18****
Intervention status	- 0.10	0.11	- .05
Child gender (female)	0.01	0.02	.03
Parent race (white)	0.05	0.12	.02
Parent education (low)	- 0.05	0.14	- .02
Income	0.01	0.03	.03
Parent depression	- 0.002	0.006	- .02
Parent age	0.012	0.009	.08
Warmth	- 0.94	0.30	**- .29****
Effective management	0.29	0.10	**.23****
Warmth X Effective management [a]	0.06	0.28	.06
Intercept and slope correlation	- 1.19	0.54	**- .26*** **
Intercept R^2 =.54***			
Slope R^2 =.12**			
Model fit: RMSEA = .012; CFI = .996; TLI = .994; SRMR = .023			
Ratio of observations to free parameters: 685:72= 10:1			

Notes: [a] Interaction effect is from separate model compared to main effects model and effect therefore does not contribute to the R^2 reported. $^{+}$p<.10, *p<.05, ** p<.01, ***p<.001

Table 5.3.4: Parental warmth and effective management at age 2-3 predicting trajectories of child internalising age 3 to 7.5

Predictor variables	Unstandardised estimate (B)	Standard error (SE)	Standardised estimate (β)
Effect on the intercept			
Internalising age 2	0.65	0.04	**.68*** **
Intervention status	- 0.67	0.40	- .06^{+}
Child gender (female)	0.03	0.06	.02
Parent race (white)	0.24	0.42	.02
Parent education (low)	0.20	0.56	.01
Income	0.01	0.09	.004
Parent depression	0.07	0.02	**.12****
Parent age	- 0.002	0.033	- .003
Warmth	- 0.94	0.95	- .03
Effective management	- 1.28	0.40	**- .16*** **
Warmth X Effective management [a]	0.61	1.07	.10
Effect on slope			
Internalising age 2	- 0.06	0.01	**- .50*** **
Intervention status	0.02	0.07	- .02
Child gender (female)	0.02	0.01	.08
Parent race (white)	0.09	0.07	.06
Parent education (low)	- 0.10	0.10	- .06
Income	0.01	0.02	.02
Parent depression	- 0.001	0.004	- .01
Parent age	0.01	0.01	.06
Warmth	- 0.28	0.17	- .12^{+}
Effective management	0.25	0.07	**.25*** **
Warmth X Effective management [a]	- 0.30	0.14	**- .17***
Intercept and slope correlation	- 0.94	0.31	**- .41*** **
Intercept R^2 =.59***			
Slope R^2 =.37***			
Model fit: RMSEA = .023; CFI = .984; TLI = .997; SRMR = .026			
Ratio of observations to free parameters: 685:72= 10:1			

Notes: [a] Interaction effect is from separate model compared to main effects model and effect therefore does not contribute to the R^2 reported. $^{+}$p<.10, *p<.05, ** p<.01, ***p<.001

5.4. Results of research question 4: Do early parental warmth (age 2-3) and later effective management (age 5) predict child externalising and internalising behaviour at age 5 and 7.5, and do these parenting dimensions interact over and above their additive effects in predicting these child outcomes?

This research question tests the hypothesis that early parenting related to attachment theory ('warmth') and later parenting based on social learning theory ('effective management'), both constitute protective factors for child behavioural and emotional problems, as suggested by Greenberg et al. (1993) in their risk model approach. It was hypothesised that higher levels of warmth at age 2-3 and higher levels of effective management at age 5 would both uniquely predict lower child externalising and internalising symptoms at age 5 and 7.5. Furthermore, based on the 'bridging model' proposed by Shaw and Bell (1993), the hypothesis is tested that early attachment and later social learning parenting are interrelated, by examining effects of an interaction between these parenting dimensions. It was hypothesised that an interaction between high levels of warmth at age 2-3 and high levels of effective management at age 5 would be predictive of children showing lower levels of externalising and internalising problems at age 5 and 7.5.

5.4.1. SEM models: warmth at age 2-3 and effective management at age 5 predicting externalising and internalising at age 5 and 7.5

The hypothesised structural equation model examining early warmth and later effective management as predictors of child functioning at each respective assessment point at age 5, and 7.5 is shown in Figure 5.4.1. Parental warmth at age 2-3 and effective management at age 5 were included simultaneously as predictors, and also the interaction between these parenting variables was modelled to predict child functioning. A model was run for age 5

and one for age 7.5, with externalising and internalising entered simultaneously and specified to covary. As in the previous research question, the two step LMS method was adopted for analysing interactions. First, models were run without the interaction to assess the main effects of the two latent parenting variables as predictors, and then models were run with the interaction term. Results of the SEM models with all estimated path coefficients are presented in Figures 5.4.4 and 5.4.5 (Appendix D). Both models demonstrated good fit with the data (RMSEA <.05; CFI and TLC >.95; SRMR <.08). Results of regression coefficients between parenting constructs and child outcomes are summarised in Table 5.4.1 that shows main effects, and in Table 5.4.2 where interaction effects are presented. Graphical illustrations of the standardised coefficients are in Figures 5.4.2 and 5.4.3, which show child externalising and internalising outcomes respectively. In the following, the results of main effects are first presented and then results of the interaction are reported.

5.4.1.1. Main effects of warmth age 2-3

As shown in Table 5.4.1, Figure 5.4.2, and Figure 5.4.3, it was found that higher levels of early parental warmth at age 2-3 predicted lower child externalising at age 5 (β = -.24, p <.001) and at age 7.5 (β = -.22, p <.001), and lower internalising problems at age 5 (β = -.12, p <.05) and at age 7.5 (β = -.16, p <.01). This was independent of effective management at age 5 and covariates in the model. These are largely the same results as those reported previously for research question 3 that assessed early warmth together with early effective management (both at age 2-3) as predictors of child outcomes.

5.4.1.2. Main effects of effective management age 5

As for the association between age 5 parental effective management and child externalising and internalising problems at age 5 and 7.5, when controlling for early warmth at age 2-3 and covariates, no significant relationships were found (Table 5.4.1, Figures 5.4.2 and 5.4.3).

5.4.1.3. Interaction effect of warmth age 2-3 and effective management age 5

In the second step of analyses the interaction between early parental warmth at age 2-3 and effective management at age 5 was included in models. Results (Table 5.4.2, Figures 5.4.2 and 5.4.3) showed that the interaction was a significant predictor of age 5 externalising (β = -.15, $p<.01$) and internalising (β = -.10, $p<.05$), but it did not predict these measures of child functioning at age 7.5.

Additional analyses that are not presented here were carried out in order to test alternative explanations for these interaction effects. For example, it could be the case that the interaction reflects an effect of a continuity of positive parenting practices, regardless of their theoretical framework. That is, parents who interact with their children positively at an early age, and who continue to do so at a later stage, would be expected to have children that are better adjusted. Therefore, analyses were run that tested the interaction between all combinations of early and later parenting: a) effective management age 2-3 x warmth age 5, b) warmth age 2-3 x warmth age 5, and c) effective management age 2-3 x effective management age 5. Any significant interaction effects in these alternative models would call into question that interpretation of the previous findings supporting the bridging model that specifically hypothesised an interaction between early attachment and later social learning. Results of these additional analyses showed that there were no significant interaction effects between early and later parenting in these alternative models.

5.4.2 Conclusion

These investigations examined early parenting at age 2-3 associated with attachment theory ('warmth') and later parenting at age 5 related to social learning theory ('effective management') as predictors of child externalising at age 5 and 7.5, and also interaction

effects between these dimensions of parenting were tested. Findings do not support the hypothesis that both early warmth and later effective management are predictive of child functioning (Greenberg et al., 1993), when testing their independent effects. Results showed that higher level of early warmth at age 2-3 predicted lower levels of child conduct and emotional problems later at age 5 and 7.5, with effects showing a greater magnitude for child externalising than for internalising problem, but effective management at age 5 was not predictive of these child outcomes.

However, as indicated by the significant interaction effects, high effective management at age 5 was a predictor of concurrent child conduct and emotional functioning in the context of high levels of early parental warmth at age 2-3. In other words, if accompanied by early parental warmth, later effective management at early school age appears to have a positive effect on child adjustment, although only for concurrent child outcomes at age 5 and not for longer-term child functioning at age 7.5. Alternative models with interaction between early and later parenting were tested, but these demonstrated no significant predictive effect on child functioning. Therefore, the only linkage between earlier and later parenting associated with child outcomes was the relationship between early warmth and later effective management, as predicted in Shaw and Bell's (1993) 'bridging model'. This model suggests that children who are securely attached in infancy are less likely to develop coercive cycles of interactions with their caregivers later in development, and they are therefore less likely to develop conduct problems. In the current study, early parenting related to secure attachment (warmth), and parenting thought to prevent coercive cycles (effective management), were found to interact.

Overall, findings suggest that parents who show their children a high degree of warmth during the toddler years and later, and at early school age effectively manage their children, provide protection for their children against conduct and emotional problems.

Figure 5.4.1: Theoretical SEM model for research question 4: parental warmth at age 2-3 and effective management at age 5 predicting externalising and internalising at age 5 and 7.5

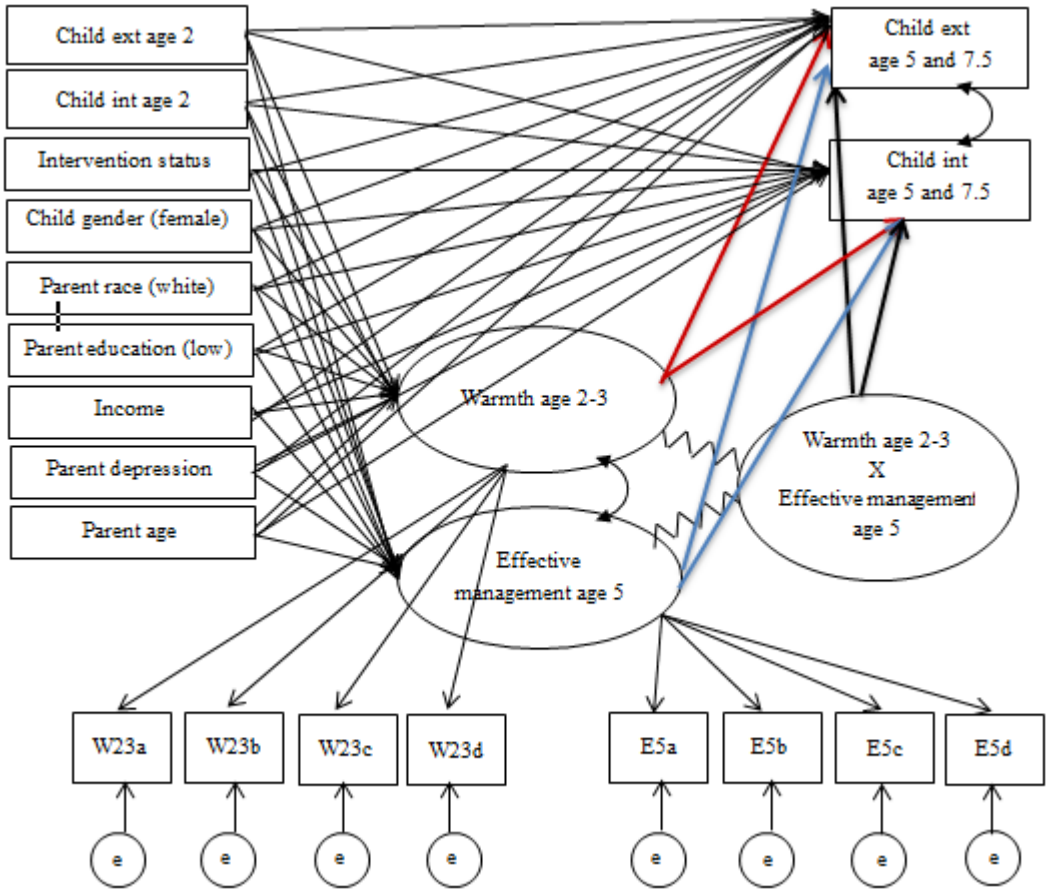


Table 5.4.1: Main effects of parental warmth at age 2-3 and effective management at age 5 as predictors of child externalising and internalising at age 5 and 7.5

Child outcome	Warmth age 2-3			Effective management age 5		
	B	S.E	β	B	S.E	β
Externalising age 5	-6.10	1.62	**-.24*** **	-0.34	0.50	-.03
Externalising age 7.5	-6.74	1.85	**-.22*** **	-0.42	0.57	-.04
Internalising age 5	-1.93	0.90	**-.12***	-0.11	0.31	-.02
Internalising age 7.5	-3.61	1.41	**-.16****	-0.16	0.46	-.02

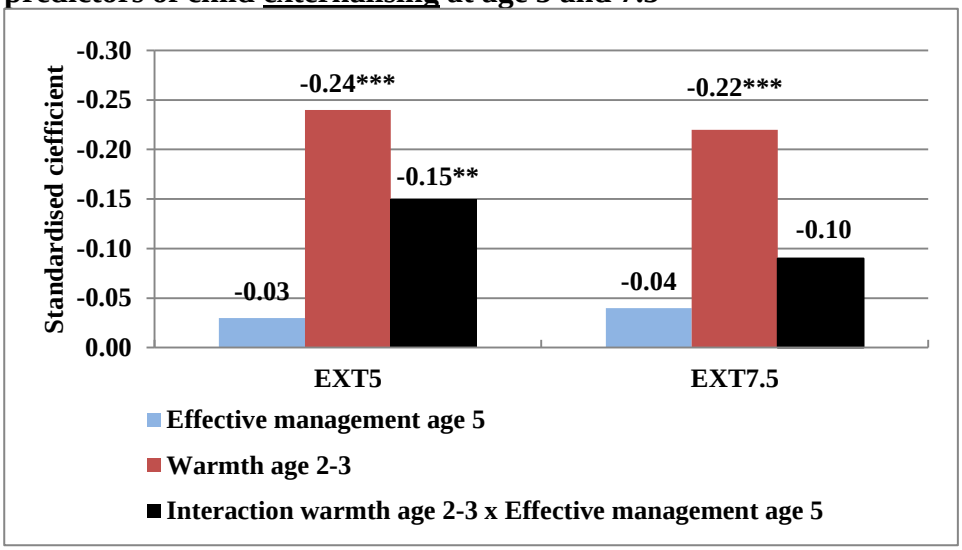
Notes: Figures are regression coefficients from structural equation models (See Figures 5.4.4 and 5.4.5).
Control variables in models are: child behaviour age 2, intervention group, gender of child, parent race, parent education, income, parent depression, parent age. *p<.05, ** p<.01, ***p<.001

Table 5.4.2: Interaction effects between parental warmth age 2-3 and effective management at age 5 as predictor of child externalising and internalising at age 5 and 7.5

	Warmth age 2-3 Warmth age 2-3 X Effective management age 5		
Child outcome	**B**	**S.E**	**β**
Externalising age 5	-3.67	1.28	**-.15****
Externalising age 7.5	-2.54	1.78	-.09
Internalising age 5	-1.60	0.68	**-.10***
Internalising age 7.5	-0.35	1.58	-.04

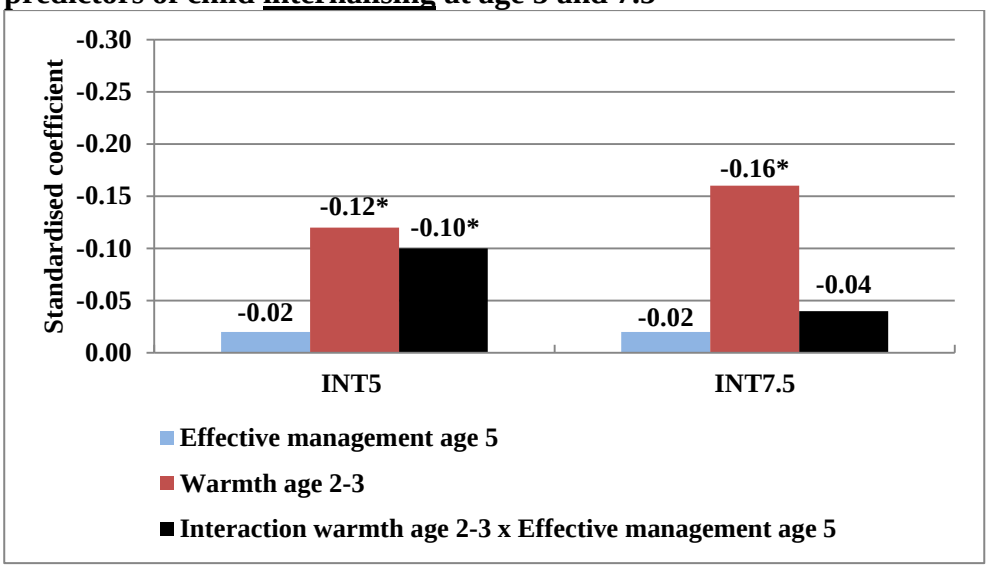
Notes: Figures are regression coefficients from structural equation models (See Figures 5.4.4 and 5.4.5).
Control variables in models are: child behaviour age 2, intervention group, gender of child, parent race, parent education, income, parent depression, parent age. *p<.05, ** p<.01, ***p<.001

Figure 5.4.2: Parental warmth at age 2-3 and effective management at age 5 as predictors of child externalising at age 5 and 7.5



Notes: Control variables in models are: child behaviour age 2, intervention group, gender of child, parent race, parent education, income, parent depression, parent age. *p<.05, **p<.01, ***p<.001

Figure 5.4.3: Parental warmth at age 2-3 and effective management at age 5 as predictors of child internalising at age 5 and 7.5



Notes: Control variables in models are: child behaviour age 2, intervention group, gender of child, parent race, parent education, income, parent depression, parent age. *p<.05, **p<.01, ***p<.001

RESULTS PART II: Comparing early and later parental warmth and effective management as predictors of child conduct and emotional problems

This part reports results of analyses that address research questions 5 to 7 that examine early and later parenting behaviours simultaneously as predictors of child conduct and emotional problems. These questions test the *enduring effects* perspective versus the *revisionist* perspective of early parental influences in childhood (Fraley et al., 2013). The enduring effects model proposes that early childhood experiences, such as parenting, have lasting or enduring effects in child adjustment (Fraley et al., 2013; Raby et al., 2015; Sroufe et al, 1990, 2010). In contrast, the revisionist perspective suggest that early experiences are insignificant as they are dominated by later experiences that have more causal effects on child functioning (Bruer, 1999; Clarke & Clarke, 1981; Harris, 1998; Lewis, 1997).

In these analyses, early and later parenting associated with attachment ('warmth') and parenting related to social learning ('effective management') were first examined separately in questions 5 and 6, respectively. Then in question 7, the two theoretical parenting constructs were examined together, which allowed an examination and comparison of their unique relationship to child functioning. In all models, parenting at age 2-3 and age 5 were modelled simultaneously, along with repeated measures of child functioning at age 3, 4, 5 and 7.5. This permitted an examination of temporal aspects of the relationship between these theoretical parenting constructs and child functioning, including a comparison of the predictive effect of early versus later parenting, and a study of short-term and long-term effects of the respective parenting dimensions. These models provided a thorough examination of any sleeper effects of early parental warmth on children's longer-term outcomes, which was indicated in analyses reported in the previous chapter that only examined early parenting at age 2-3. In the reporting of results of the following research

questions, age 5 parenting was first examined on its own as a predictor of child functioning before being modelled with earlier parenting.

The relationships between parenting and child conduct and emotional functioning were examined in autoregressive cross-lagged models as detailed previously in the methods chapter. These models were built in stages, and first autoregressive measurement models of both parenting and child functioning were run that test their within construct stability over time. Results of these were reported in the preliminary analyses in Chapter 4 and showed that all models had a good fit. The next step, which addresses the current research questions, was to examine the cross-lagged relationships between parenting to child outcomes over time. Child externalising and internalising outcomes were examined in separate models as this makes for a clearer presentation of results. Indirect or mediation effects were modelled, which is one of the advantages of autoregressive models, and this is an especially useful way of examining potential sleeper effects. This allowed the testing of whether effects of earlier parenting on later child outcomes are mediated through later parenting.

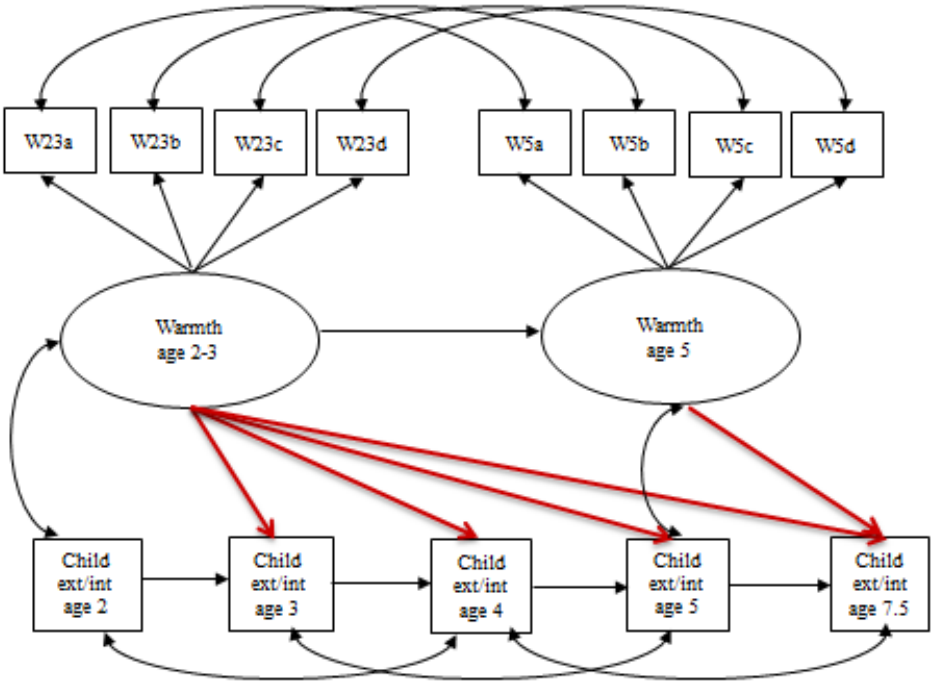
In additional analyses, bidirectional effects were tested in order to examine if parenting behaviour is influenced by child behaviour. This was examined in modified models where parenting at age 2 and 3 were disaggregated and entered with age 5 parenting in autoregressive models, with two-way bidirectional cross-lagged paths modelled between all parenting measures and child functioning at age 2, 3 and 5. Modifying the models in this way was in order for all two-way lags to be equivalent in time, which makes for a better comparison of cross-lagged effects from parenting to child behaviour and from child behaviour to parenting.

II.0. Specification of cross-lagged models

A series of cross-lagged models were computed. The hypothesised models are shown in Figures 5.5.1, 5.5.2 and 5.5.3, for questions 5, 6 and 7 respectively. In these models, all longitudinal paths between parenting predictors and child outcomes are in bold. Strictly speaking, the relationship between age 2-3 parenting and age 3 child functioning is not truly longitudinal as this parenting measure only partly precedes this child outcome. However, this hypothesised predictive relationship it is built on the assumption that parenting is the main driver of the association between parent and child variables, although bi-directional effects were also tested and results are presented as additional analyses to the examination of the main research questions. The relationship between concurrent parenting and child behaviour at age 2 and at age 5 is specified with correlations (double arrowed paths). Again, it should be pointed out that the relationship at age 2 is only partly concurrent because of the aggregation of parenting across age 2 and 3. In all models the same covariates as were used in the examination of the previous research questions were modelled onto parenting predictors and child outcome at every time point because it is theoretically conceivable that these exert influence at each time point. The exception to this is intervention status, which was not modelled onto age 2 child behaviour because the FCU intervention had not yet taken place. Analyses confirmed that these model specifications resulted in a better fit than in alternative models with covariates predicting only the first measurement point for parenting and child variables.

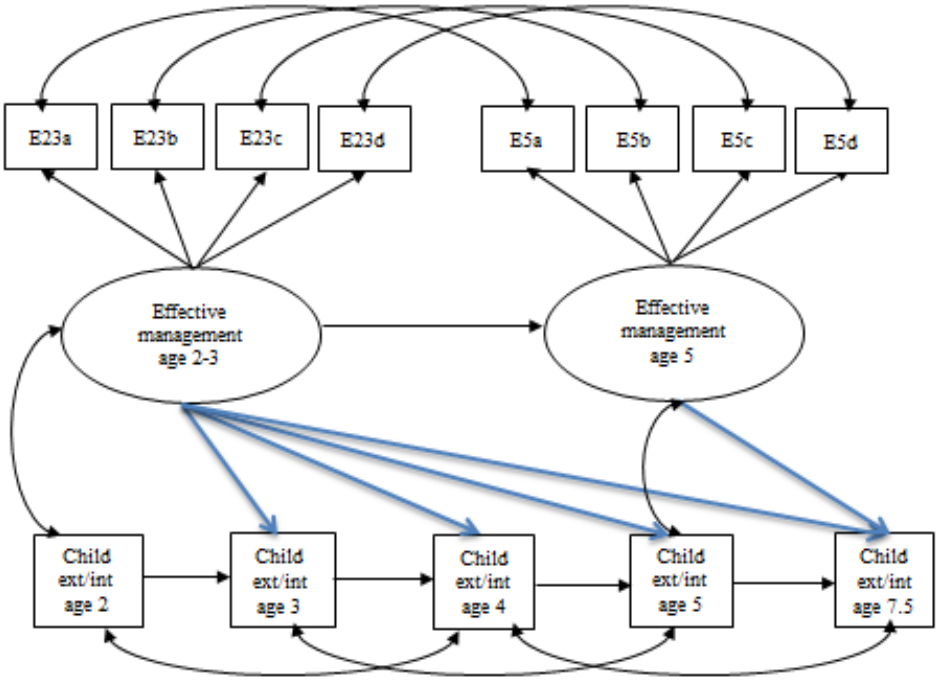
Further specifications for the autoregressive part of the models were described in the preliminary analyses in Chapter 4, i.e. constraining loading to be equal across time, and correlations between residuals of corresponding indicators. As in previous analyses, models that included parental warmth, which had some binary indicators, used the WLSMV estimator, and for analyses with continuous indicators the MLR estimator was used. Indirect effects that examined how earlier effects are carried through to later child outcomes were obtained using the Delta method.

Figure 5.5.1: Theoretical model for research question 5: Does early parental warmth (age 2-3) predict child conduct and emotional problems at age 5 and 7.5 when parenting at age 5 is controlled for?



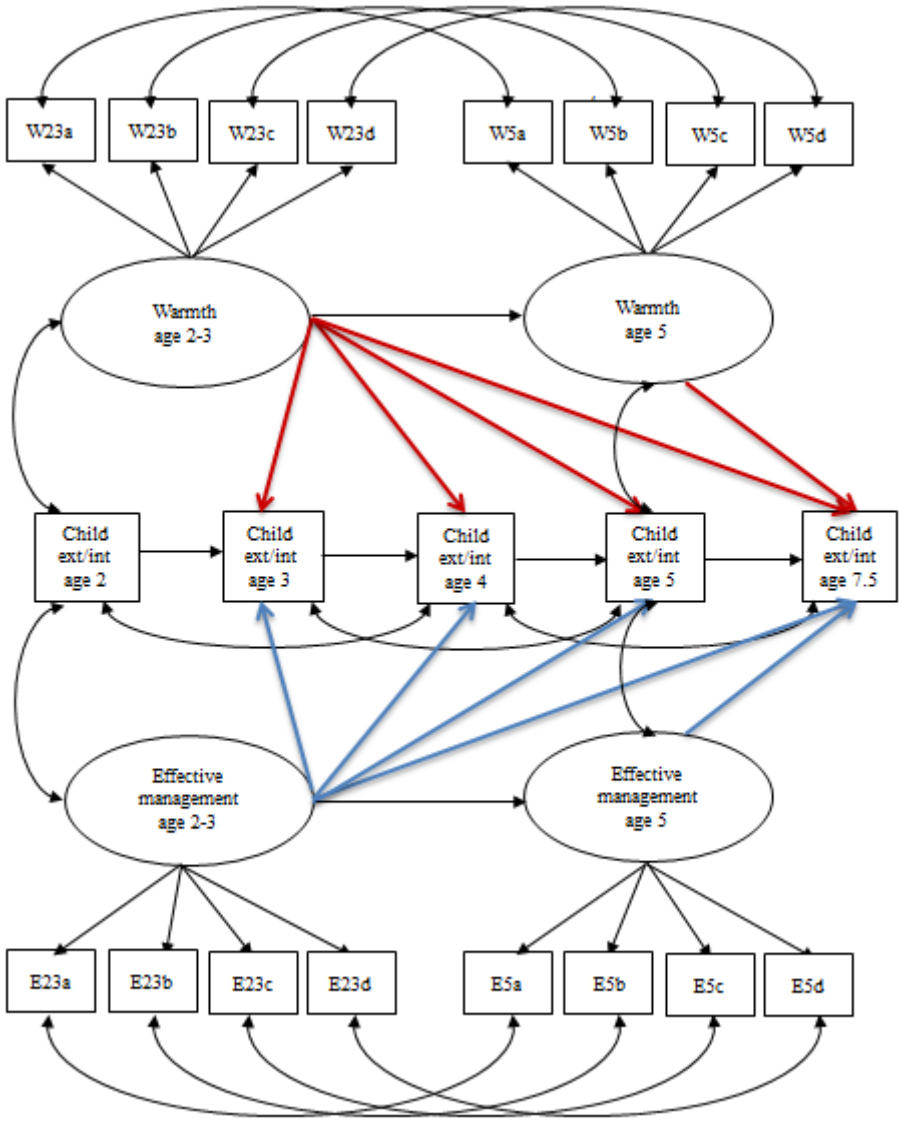
Notes: Covariates are intervention status, child gender, parent race, parent education, income, parent depression, parent age

Figure 5.5.2: Theoretical model for research question 6: Does early parental effective management (age 2-3) predict child conduct and emotional problems at age 5 and 7.5 when parenting at age 5 is controlled for?



Notes: Covariates are intervention status, child gender, parent race, parent education, income, parent depression, parent age

Figure 5.5.3: Theoretical model for research question 7: Do early parental warmth and early effective management (age 2-3) predict child conduct and emotional problems at age 5 and 7.5 when parenting at age 5 is controlled for?



Notes: Covariates are intervention status, child gender, parent race, parent education, income, parent depression, parent age

5.5. Results of research question 5: Does early parental warmth (age 2-3) predict child conduct and emotional problems at age 5 and 7.5 when parenting at age 5 is controlled for?

5.5.1. Warmth predicting child externalising

5.5.1.1. Age 5 parental warmth predicting child externalising

Figure 5.5.4 below shows results of the relationship between parental warmth at age 5 and child externalising concurrently at age 5, and longitudinally at age 7.5, where these child outcomes were entered simultaneously in an autoregressive model. The model had a very good fit with the data (RMSEA = .004; CFI = 1.000; TLI = 0.999; WRMR = .531). There was a significant relationship between parental warmth and child externalising concurrently at age 5 (β = -.26, p<.001) that showed that higher levels of parental warmth predicted lower child externalising problems. Longitudinally, parental warmth at age 5 was not predictive of externalising at age 7.5 once the concurrent relationship at age 5 was controlled for.

5.5.1.2. Age 2-3 and age 5 parental warmth predicting child externalising

Next, both early warmth at age 2-3 and later warmth at age 5 were modelled simultaneously. This was in order to examine if early parental warmth was a significant predictor of child externalising at age 5 and age 7.5, when later warmth closer in time with child these outcomes was controlled for. This was tested in an autoregressive cross-lagged model where all longitudinal relationships between parenting (at age 2-3 and age 5) and child externalising outcomes from age 3 to 7 were as modelled as predictive paths, and concurrent relationships were modelled as correlations. Results are shown in Figure 5.5.5. Note that indicators of the latent parenting variables are not shown in this figure and the reader is referred to results of the measurement model presented previously in Chapter 4. Neither are

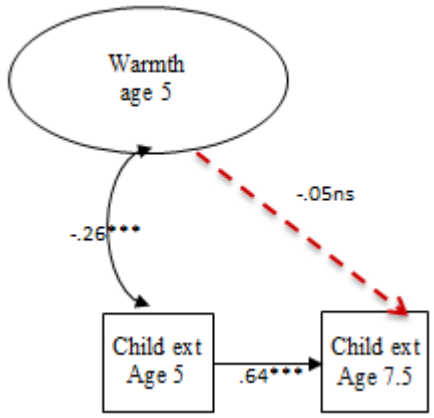
covariates shown, but these were modelled onto all parenting and child measures. Overall model fit was good (RMSEA = .013; CFI = 0.996; TLI = 0.992; WRMR = .61).

Results showed that higher parental warmth at age 2-3 was directly associated with fewer child externalising symptoms at age 3 (β = -.15, p<.001), at age 4 (β = -.13, p<.001), and at age 5 (β = -.14, p<.001), but there was no direct effect on externalising at age 7.5. In addition to these main effects, there were a number of indirect effects, which are reported in Table 5.5.1. Parental warmth at age 2-3 had an indirect effect on child externalising outcomes at age 4 (β = -.08, p<.001), at age 5 (β = -.13, p<.001), and at age 7.5 (β = -.20, p<.001). These indirect effects were mediated through effects of early warmth on child externalising at a previous time. These specific indirect effects are also detailed in Table 5.5.1. For example, indirect effects on age 5 externalising were mediated through externalising at age 3 (β = -.05, p<.001) and at age 4 (β = -.05, p<.001), and through age 3 and 4 combined (β = -.03, p<.001). In other word, in addition to the direct effect of early parental warmth predicting lower child externalising problems, as reported above, these effects continued to translate into further effects by predicting later externalising behaviours. Note that there was no indirect effect of early warmth through later warmth at age 5. When considering both the direct and indirect effect, the total effect of early parental warmth at age 2-3 on child externalising behaviours increased over time: age 3 (β = -.15, p<.001), age 4 (β = -.21, p<.001), age 5 (β = -.27, p<.001), and age 7.5 (β = -.23, p<.001). These results are parallel to those reported previously in research question 1 where warmth was tested as a predictor of child externalising in models that analysed this child outcome separately at each age.

Last is a re-examination of the effect of parental warmth at age 5, on child externalising at age 5 and at age 7.5, which was examined previously in Figure 5.5.4 in the model without the early measure or warmth and earlier child outcomes. When parental

warmth at age 2-3 and earlier child outcomes were included in the model (Figure 5.5.5 right hand side), parental warmth at age 5 was no longer associated with concurrent child externalising at age 5, and it was still not predictive of externalising longitudinally at age 7.5. This suggests that the concurrent relationship found previously was due primarily to effects (both direct and indirect) of parental warmth at an earlier developmental stage.

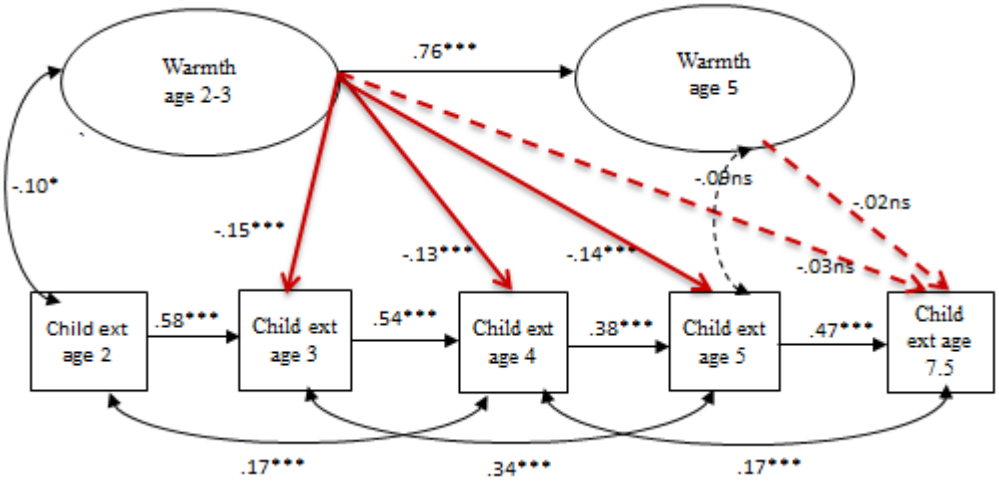
Figure 5.5.4: Results of model with parental warmth at age 5 predicting child externalising at age 5 and 7.5



Model fit: RMSEA = .004; CFI = 1.000; TLI = 0.999; WRMR = .531

Notes: 1) Latent variable indicators are not shown. 2) Covariates are intervention status, child gender, parent race, parent education, income, parent depression, parent age. 3) Figures are standardised coefficients. 4) + p<.10, *p<.05, ** p<.01, ***p<.001, 5) Ratio of observations to free parameters: 640:37 = 17:1

Figure 5.5.5: Results of longitudinal model of parental warmth as predictor of child externalising



Model fit: RMSEA = .013; CFI = 0.996; TLI = 0.992; WRMR = .61

Notes: 1) Latent variable indicators are not shown. 2) Covariates: Intervention status, child gender, parent race, parent education, income, maternal depression, maternal age. 3) Figures are standardised coefficients.
4) + p<.10, *p<.05, ** p<.01, ***p<.001, 5) Ratio of observations to free parameters: 720:95 = 8:1

Table 5.5.1: Direct, indirect, and total effects from parental warmth age 2-3 to child externalising age 3, 4, 5 and 7.5 (standardised coefficients)

		Warmth age 2-3 Predicting:			
		Ext age 3	**Ext age 4**	**Ext age 5**	**Ext age 7.5**
		β	**β**	**β**	**β**
Direct effect		**-.15*****	**-.13*****	**-.14*****	-.03ns
Indirect effect			**-.08*****	**-.13*****	**-.20*****
Specific indirect	**Ext 3**		**-.08*****	**-.05*****	
	Ext 4			**-.05*****	**-.04****
	Ext 3, Ext 4			**-.03*****	**-.02****
	Ext 3, Ext 5				**-.03*****
	Ext 4, Ext 5				**-.02*****
	Ext 3, Ext 4, Ext 5				**-.02*****
	Ext 5				**-.07***
	Warmth 5				-.01ns
Total effect		**-.15*****	**-.21*****	**-.27*****	**-.23*****

Notes: Control variables in models are child behaviour age 2, intervention group, gender of child, parent race, parent education, income, parent depression, parent age.
+ p<.10, *p<.05, ** p<.01, ***p<.001

5.5.2. Warmth predicting child internalising

5.5.2.1. Age 5 parental warmth predicting child internalising

Figure 5.5.6 shows the regression coefficients for the relationship between parental warmth at age 5 and child internalising behaviour concurrently at age 5 and longitudinally at age 7.5, where child outcomes are entered autoregressively. Neither of these parameters demonstrated significance. The model had good fit with the data (RMSEA = .005; CFI = 0.999; TLI = 0.999; WRMR = .535).

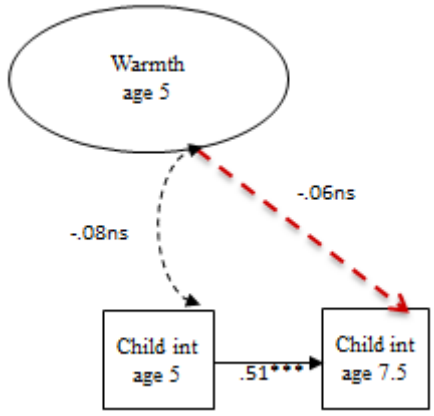
5.5.2.2. Age 2-3 and age 5 parental warmth predicting child internalising

Next, early and later parenting variables were modelled simultaneously and Figure 5.5.7 show results of this larger longitudinal autoregressive model. This included warmth both at age 2-3 and at age 5 as predictors of child internalising problems across time from age 3 to age 7.5. This therefore examined early warmth as a predictor of child outcomes whilst parenting more concurrent in time was also considered. Overall, this model demonstrated a

good fit with the data (RMSEA = .025; CFI = 0.982; TLI = 0.971; WRMR = .720). Results of path coefficients in this model showed that higher levels of warmth at age 2-3 was related to lower child internalising problems at age 3 (β = -.14, p<.001), but there were no other direct longitudinal effects of parental warmth at age 2-3. However, as shown in Table 5.5.2, there were significant indirect effects of early warmth at age 2-3 on child internalising at age 4 (β = -.07, p<.001) and at age 5 (β = -.09, p<.001), These were mediated through earlier effect of warmth on children's internalising behaviours that continued to predict later symptoms. Note that there were no indirect effects of early warmth through later warmth at age 5. Considering both direct and indirect effects, early parental warmth at age 2-3 had a fairly consistent predictive effect on child internalising behaviour across time: age 3 (β = -.14, p<.001), age 4 (β = -.15, p<.01), age 5 (β = -.14, p<.01), and age 7.5 (β = -.16, p<.01). These results are comparable to those reported previously for research question 2 where early effective management was examined as a predictor of these child outcomes

Also shown in Figure 5.5.7 (right hand side) are results of parental warmth at age 5 and its association with internalising at age 5 and 7.5, whilst controlling for early warmth at age 2-3 and with earlier measures of child internalising included in this autoregressive model. Results reconfirm the findings reported previously that, although closer in time with these child outcomes, parental warmth at age 5 was not predictive of child internalising at age 5 or at age 7.5. However as reported above, age 5 and 7.5 internalising outcomes were predicted (directly and indirectly) by early parental warmth.

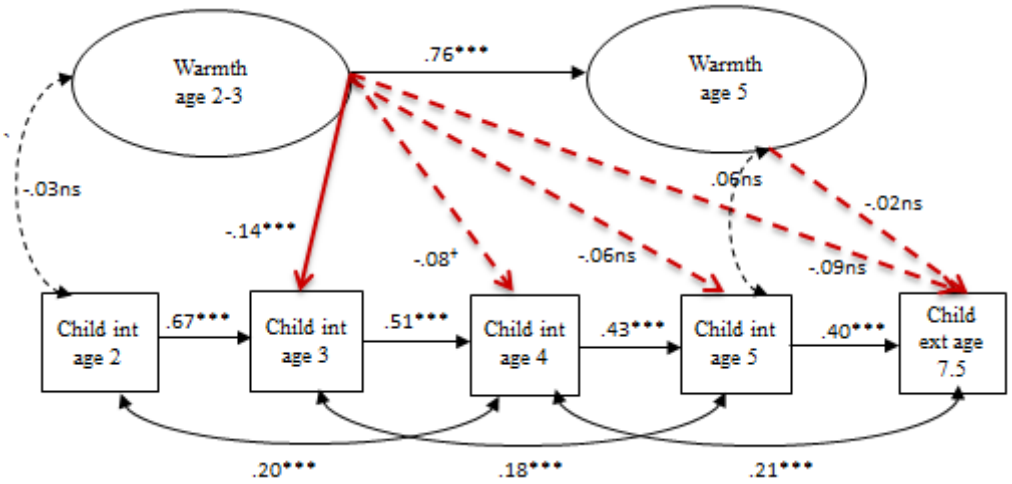
Figure 5.5.6: Results of model with parental warmth at age 5 predicting child internalising at age 5 and 7.5



Model fit: RMSEA = .005; CFI = 0.999; TLI = 0.999; WRMR = .535

Notes: 1) Latent variable indicators are not shown. 2) Covariates are intervention status, child gender, parent race, parent education, income, parent depression, parent age. 3) Figures are standardised coefficients. 4) + p<.10, *p<.05, ** p<.01, ***p<.001, 5) Ratio of observations to free parameters: 640:37 = 17:1

Figure 5.5.7: Results of longitudinal model of parental warmth at age 2-3 and age 5 as predictors of child internalising



Model fit: RMSEA = .025; CFI = 0.982; TLI = 0.971; WRMR = .720

Notes: 1) Latent variable indicators are not shown. 2) Covariates are intervention status, child gender, parent race, parent education, income, parent depression, parent age. 3) Figures are standardised coefficients. 4) + p<.10, *p<.05, ** p<.01, ***p<.001. 5) Ratio of observations to free parameters: 720:89 = 8:1.

Table 5.5.2: Direct, indirect, and total effects from parental warmth age 2-3 to child internalising age 3, 4, 5 and 7.5 (standardised coefficients)

		Warmth age 2-3 predicting			
		Int age 3	**Int age 4**	**Int age 5**	**Int age 7.5**
		β	**β**	**β**	**β**
Direct effect		**-.14*** **	**-.08+**	-.06ns	-.09ns
Indirect effect			**-.07*** **	**-.09*** **	-.08ns
Specific indirect	**Int 3**		**-.07*** **	**-.03****	
	Int 4			-.03+	-.04+
	Int 3, Int 4			**-.03****	**-.01****
	Int 3, Int 5				**-.01****
	Int 4, Int 5				-.01+
	Int 3, Int 4, Int 5				**-.01****
	Int 5				-.02ns
	Warmth 5				.01ns
Total effect		**-.14*** **	**-.15****	**-.14****	**-.16****

Notes: Control variables in models are: child behaviour age 2, intervention group, gender of child, parent race, parent education, income, parent depression, parent age.
+ p<.10, *p<.05, ** p<.01, ***p<.001

5.5.3. Conclusion

These analyses examined parental warmth during the toddler years as a predictor of child externalising and internalising problems later at early school age, whilst considering also effects of later parenting that was more concurrent in time with these child outcomes. Overall results suggested that higher levels of parental warmth in early childhood at age 2-3 significantly predict lower levels of child externalising and internalising problems later when children reached age 5 and age 7.5. This was over and above later parenting at age 5 that was closer in time with these child outcomes, but which showed no association with these. There was indication that there may be sleeper effects of early parental warmth on child externalising outcomes, as effect were larger for later child outcomes than for earlier. These sleeper effects were due to direct effects of early parenting on later child externalising outcomes, and there were also indirect effects through earlier effects of warmth that continued to cascade through to later measures of child functioning. Internalising problems were predicted less strongly by parental warmth, and whilst there was no evidence of sleeper

effects there were enduring longitudinal effects due to indirect effects via previous child functioning that predicted later emotional adjustment.

It should be noted that in these analyses parental warmth was examined alone, and therefore results presented here are preliminary, as the larger objective of this thesis was to compare these parenting practices with parental effective management. Analyses in research question 7 will examine both parenting dimensions simultaneously, and thereby provide their unique effects, which will allow a direct comparison between parenting practices associated with attachment theory and social learning theory, respectively.

5.6. Results of research question 6: Does early parental effective management (age 2-3) predict child conduct and emotional problems at age 5 and 7.5 when parenting at age 5 is controlled for?

5.6.1. Effective management predicting child externalising

5.6.1.1. Age 5 parental effective management predicting child externalising

Figure 5.6.1 shows results of the relationship between parental effective management at age 5 and child externalising behaviour concurrently at age 5 and longitudinally at age 7.5, where these child outcomes are modelled autoregressively. Concurrently at age 5, higher levels of effective management were associated with lower child externalising problems (β = -.16, p<.001). There was no longitudinal relationship between age 5 parenting and child functioning at age 7.5 independent of the concurrent relationship at age 5. The overall fit of the model was good (RMSEA = .024; CFI = 0.990; TLI = 0.980; SRMR = .016).

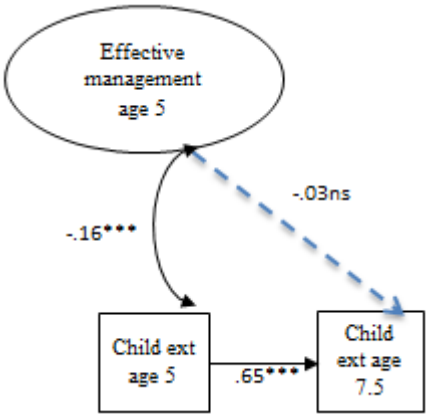
5.6.1.2. Age 2-3 and age 5 parental effective management predicting child externalising

The next step was to simultaneously model early effective management at age 2-3 and later parenting at age 5 as predictors of child externalising. This was in order to examine the unique contribution of earlier and later parenting in explaining variances in these behavioural problems. All longitudinal relationships from parenting at age 2-3 and age 5 to child externalising outcomes from age 3 to 7 were modelled as predictive paths, and concurrent relationships were modelled as correlations. Results are shown in Figure 5.6.2. Overall, the model demonstrated a good fit with the data (RMSEA = .022; CFI = 0.989; TLI = 0.981; SRMR = .036). In terms of the lagged effects from parenting to child functioning, higher levels of effective management at age 2-3 predicted lower child externalising problems at age 3 (β = -.15, p<.001) and at age 4 (β = -.09, p<.001), but there was no significant direct

prediction of later child externalising at age 5 or at age 7.5. However, there were a number of indirect effects (Table 5.6.1) on child externalising at age 4 (β = -.10, p<.001), at age 5 (β = -.13, p<.001), and at age 7.5 (β = -.11, p<.01). These effects were mediated through child externalising at a previous time point that was predicted by age 2-3 effective management. In other words, earlier effects of effective management at age 2-3 on child externalising continued to cascade through to later outcomes of child externalising. Combining direct and indirect effects, total effects of effective management on child functioning were largest for age 4 externalising (β = -.19, p<.001), and then decreased slightly for later outcomes at age 5 (β = -.12, p<.001) and at age 7.5 (β = -.11, p<.05). These results are parallel to those reported previously in research question 2 where effective management was examined as a predictor of child externalising in models that analysed this child outcome separately at each age.

Next, a re-examination of effective management at age 5 as a predictor of child externalising at age 5 and 7.5, whilst controlling for earlier parenting at age 2-5. This is shown on the right hand side of Figure 5.6.2. Effective management at age 5 showed no significant association with concurrent externalising at age 5, and neither was it associated longitudinally with age 7.5 externalising. Therefore, the significant concurrent relationship between effective management and externalising at age 5, which was found in the first model reported above in Figure 5.6.1, was reduced when earlier parenting at age 2-3 was included in the model. As reported above, the effect of parental effective management at age 2-3 on age 5 and age 7.5 externalising was indirect through earlier effects of parenting continuing to predict later child externalising outcomes.

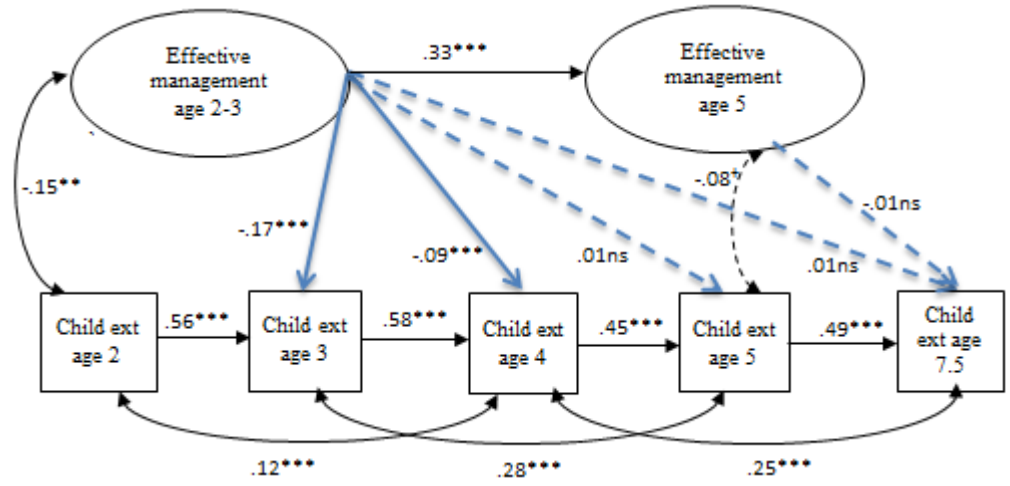
Figure 5.6.1: Results of effective management age 5 as predictor of child externalising



Model fit: RMSEA = .024; CFI = 0.990; TLI = 0.980; SRMR = .016

Notes: 1) Latent variable indicators are not shown. 2) Covariates are intervention status, child gender, parent race, parent education, income, parent depression, parent age. 3) Figures are standardised coefficients. 4) + p<.10, *p<.05, ** p<.01, ***p<.001. 5) Ratio of observations to free parameters: 640:37 = 17:1

Figure 5.6.2: Results of longitudinal model of effective management age 2-3 and age 5 as predictors of child externalising



Model fit: RMSEA = .022; CFI = 0.989; TLI = 0.981; SRMR = .036

Note: 1) Latent variable indicators are not shown. 2) Covariates are intervention status, child gender, parent race, parent education, income, parent depression, parent age. 3) Figures are standardised coefficients. 4) + p<.10, *p<.05, ** p<.01, ***p<.001, 5) Ratio of observations to free parameters: 720:98 = 7:1

Table 5.6.1: Direct, indirect, and total effects from effective management age 2-3 to child externalising age 3, 4, 5 and 7.5 (standardised coefficients)

		Effective management age 2-3 predicting			
		Ext age 3	**Ext age 4**	**Ext age 5**	**Ext age 7.5**
		β	**β**	**β**	**β**
Direct effect		**-.17*** **	**-.09*** **	-.01ns	.005ns
Indirect effect			**-.10*** **	**-.13*** **	**-.11** **
Specific indirect	**Ext 3**		**-.10*** **	**-.05*** **	
	Ext 4			**-.04** **	**-.02***
	Ext 3, Ext 4			**-.05*** **	**-.03** **
	Ext 3, Ext 5				**-.02*** **
	Ext 4, Ext 5				**-.02***
	Ext 3, Ext 4, Ext 5				**-.02*** **
	Ext 5				.006ns
	Effective management 5				-.003ns
Total effect		**-.17*** **	**-.19*** **	**-.12*** **	**-.11***

Notes: Control variables in models are: child behaviour age 2, intervention group, gender of child, parent race, parent education, income, parent depression, parent age. + p<.10, *p<.05, ** p<.01, ***p<.001

5.6.2 Effective management predicting child internalising

5.6.2.1. Age 5 parental effective management predicting child internalising

Shown in Figure 5.6.3 are results of modelling effective management at age 5 as a predictor of child internalising concurrently at age 5 and longitudinal at age 7.5. Neither of these outcomes was significantly predicted by this parenting variable. Overall fit of the model was good (RMSEA = .027; CFI = 0.986; TLI = 0.973; SRMR = .016).

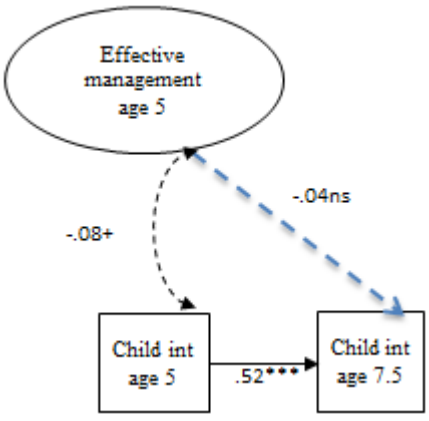
5.6.2.2. Age 2-3 and age 5 parental effective management predicting child internalising

Next, early parenting and later parenting were entered simultaneously along with all child outcomes in an autoregressive model. This longitudinal model therefore included both parental effective management at age 2-3 and at age 5 as predictors, and child internalising at age 3, 4, 5 and 7.5 as dependent variables. Results are shown in Figure 5.6.4. Overall the model had good fit with the data (RMSEA = .021; CFI = 0.989; TLI = 0.981; SRMR = .035). Estimates showed that higher levels of effective management at age 2-3 predicted

lower child internalising behaviour at age 3 (β = -.17, p<.001), but there were no further direct prediction of later internalising problems. However, as reported in Table 5.6.2, there were indirect effects on later child internalising at age 4 (β = -.09, p<.001) and at age 5 (β = -.09, p<.01), which worked through effects of effective management at age 2-3 on earlier child internalising that continued to impact later outcomes. Total effects of age 2-3 effective management on child internalising were significant at age 4 (β = -.12, p<.05), but not at age 5 as the negative indirect effect was countered with a positive direct effects of age 2-3 effective management, which means that this parenting measure was associated with higher levels of child internalising at age 5, and this reduced the total effects that overall were insignificant.

Re-examining effective management practices at age 5, when age 2 parenting was controlled for, this still showed no relationship to child internalising symptoms concurrently at age 5 or longitudinally at age 7.5.

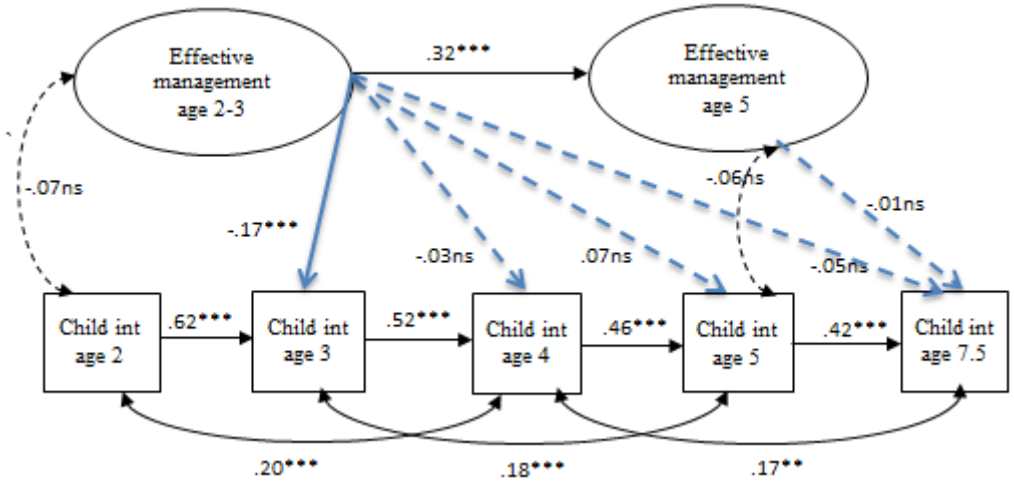
Figure 5.6.3: Results of effective management age 5 as predictor of child internalising



Model fit: RMSEA = .027; CFI = 0.986; TLI = 0.973; SRMR = .016

Notes: 1) Latent variable indicators are not shown. 2) Covariates are intervention status, child gender, parent race, parent education, income, parent depression, parent age. 3) Figures are standardised coefficients. 4) + p<.10, *p<.05, ** p<.01, ***p<.001. 5) Ratio of observations to free parameters: 641:40 = 16:1

Figure 5.6.4: Results of longitudinal model of effective management as predictor of child internalising



Model fit: RMSEA = .021; CFI = 0.989; TLI = 0.981; SRMR = .035

Note: 1) Latent variable indicators are not shown. 2) Covariates: Intervention status, child gender, parent race, parent education, income, maternal depression, maternal age. 3) Figures are standardised coefficients. 4) + p<.10, *p<.05, ** p<.01, ***p<.001, 5) Ratio of observations to free parameters: 720:98 = 7:1

Table 5.6.2: Direct, indirect, and total effects from effective management age 2-3 to child internalising age 3, 4, 5 and 7.5 (standardised coefficients)

		Effective management age 2-3 predicting			
		Int age 3	**Int age 4**	**Int age 5**	**Int age 7.5**
		B	**β**	**β**	**β**
Direct effect		**-.17*** **	-.03ns	.07ns	-.05ns
Indirect effect			**-.09*** **	**-.09****	-.03ns
Specific indirect	**Int 3**		**-.09*** **	**-.03****	
	Int 4			-.02ns	-.006ns
	Int 3, Int 4			**-.04*** **	**-.02***
	Int 3, Int 5				**-.01***
	Int 4, Int 5				-.006ns
	Int 3, Int 4, Int 5				**-.02*** **
	Int 5				.03ns
	Effective management 5				-.004ns
Total effect		**-.17*** **	**-.12***	-.01ns	-.08+

Notes: Control variables in models are: child behaviour age 2, intervention group, gender of child, parent race, parent education, income, parent depression, parent age.
+ p<.10, *p<.05, ** p<.01, ***p<.001

5.6.3. Conclusion

These analyses examined effective management during the toddler years as a predictor of child externalising and internalising problems later at early school age, whilst considering also effects of later parenting that were more concurrent in time with these child outcomes. Results showed that higher levels of early parental effective management at age 2-3 predicted lower levels of child externalising problems at age 5 and 7.5. This was over and above effects of parenting at age 5. However, total effects of effective management on child externalising appeared to attenuate over time as predictions were stronger in magnitude for earlier child assessment and became weaker for these later child externalising outcomes. Examinations showed that effects were indirect and due to effects of parenting on externalising at an earlier point in time that then predicted child problems at subsequent ages. Early effective management at age 2-3 was not predictive of internalising at child age 5 or at age 7.5, although earlier at age 3 and 4 there were significant associations. Overall results suggest that effects of early effective management on child functioning tend to attenuate over time, especially for child internalising and less so for externalising. Results are however preliminary, as only parental effective management was examined in these models, and the main objective of this thesis is to compare this parenting construct with parental warmth that is associated with attachment theory. In order to make a robust comparison, the theoretical parenting dimensions must be examined simultaneously in order to obtain their unique effects. These analyses will be undertaken in relation to research question 7 and presented in the following section of results.

5.7. Results of research question 7: Do early parental warmth and early effective management (age 2-3) predict child conduct and emotional problems at age 5 and 7.5 when parenting at age 5 is controlled for?

This final research question investigated parental warmth and effective management simultaneously as predictors of child externalising and internalising behaviours at age 5 and 7.5. This was examined in autoregressive models that included both dimensions of parenting, at age 2-3 and age 5, with these parenting variables modelled as predictors of all longitudinal cross-lagged child outcomes from age 3 to 7.5. By modelling all variables in one analytic step the unique effect of each theoretical parenting dimension could be studied and compared, including the effects of early versus later parenting. In terms of the parenting dimensions examined in this study, this addresses the important question of whether these early childhood parenting experiences aspects have enduring effects, or whether a revisionist perspective provides a better fit.

5.7.1. Warmth and effective management predicting child externalising

Presented in Figure 5.7.1 are results of parental warmth and effective management, at age 2-3 and age 5, as predictors of child externalising from age 3 to 7.5. This model demonstrated good fit with the data (RMSEA = .029; CFI = 0.963; TLI = 0.948; WRMR = .847).

First examining the predictive effect of early parental warmth at age 2-3, results showed that higher levels of warmth were significantly related to lower child externalising problems when children reached the age of 5 (β = -.26, p<.001). This was whilst controlling for parental warmth at age 5, for effective management at age 2-3 and age 5, and for covariates. There were no other direct effects of early warmth at age 2-3, but there were indirect effects, presented in Table 5.7.1, and although these were not significant they

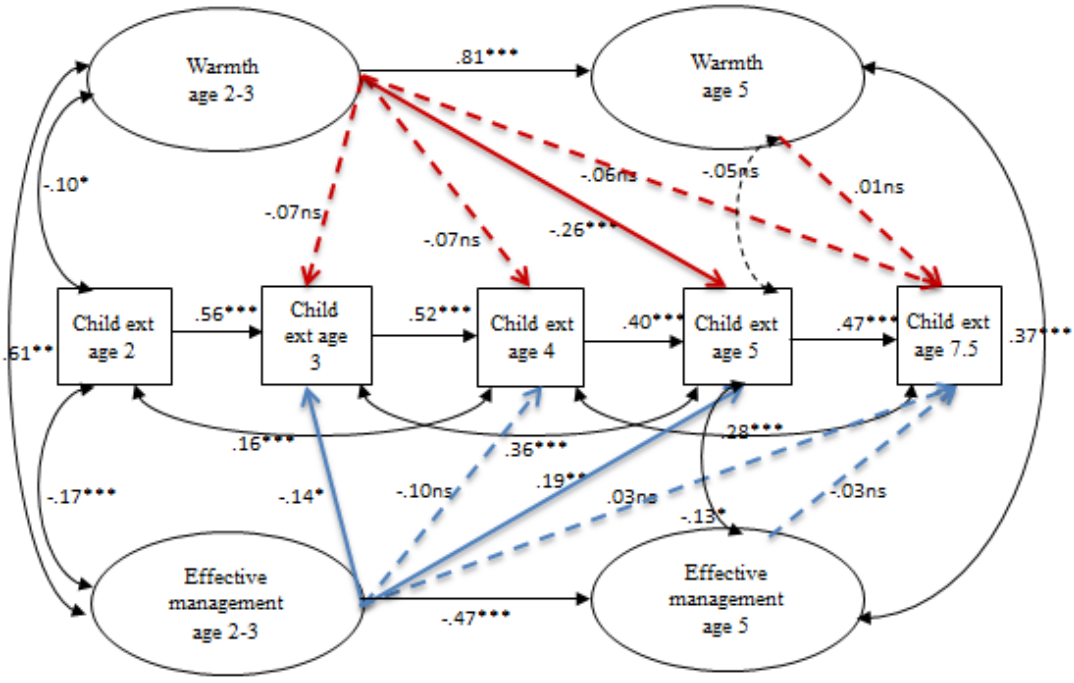
contributed to total effects of early warmth. Parallel to indirect effects reported previously, these were mediated through effects of early warmth on child externalising at a previous time. Total effects of early warmth on child externalising increased steadily over time, from an insignificant relationship age 3 and 4, to showing a moderate significant effect at age 5 (β = -.32, p<.001). At age 7.5 there was still a modest effects (β = -.24, p<.001), and as detailed in Table 5.7.1 this was driven mainly by the specific indirect effect of the effect previously on age 5 externalising. There was no indirect effect through parental warmth at age 5 on child externalising at age 7.5, which means that the effect of early warmth on these later child outcomes was not mediated through more concurrent parenting. There was no significant concurrent relationship at age 5 between parental warmth and child externalising.

Next are the results of effective management at age 2-3 as predictor of child externalising, controlling for covariates and the effect of later effective management and parental warmth at both time points. These results are shown in the bottom half of Figure 5.7.1. It was found that higher levels of effective management at age 2-3 directly predicted child externalising at age 3 (β = -.14, p<.05) but there was no prediction of externalising problems at age 4. At age 5 the predictive effect had reversed (β = .19, p<.05), meaning that higher levels of parental effective management at age 2-3 predicted higher externalising scores, and this indicates a negative impact of this early aspect of parenting across time. Early effective management showed no direct predictive effects on age 7.5 externalising.

There were also indirect effects of early effective management, reported in Table 5.7.1, on child externalising outcomes at age 4 (β = -.07, p<.05), and at age 5 (β = -.12, p<.01), which were due to earlier effects of effective management carrying on predicting later child outcomes. For externalising at age 7.5 indirect effects of early effective management showed mixed results as there were both positive and negative specific indirect effects. The direct effect of age 2-3 effective management that predicted higher child

externalising problems at age 5 contributed to negative (positive coefficient) indirect effect on age 7.5 externalising. This was countered by other specific indirect effects via effect on prior child behaviour that predicted lower child externalising at age 7.5. In terms of total effects, so direct and indirect effects combined, early effective management at age 2-3 was associated with child externalising at age 3 (β = -.12, p<.05) and at age 4 (β = -.17, p<.05), but there were no significant total effects at later stages at age 5 and age 7.5, which indicates that effects of early effective management are relatively short-lived. Concurrently at age 5, higher effective management was associated with lower child externalising problems (β = -.13, p<.05), although it showed no longitudinal predictive effect on externalising at age 7.5.

Figure 5.7.1: Results of longitudinal model of parental warmth and effective management as predictors of child externalising



Model fit: RMSEA = .029; CFI = 0.963; TLI = 0.948; WRMR = .847

Notes: 1) Latent variable indicators are not shown. 2) Covariates: Intervention status, child gender, parent race, parent education, income, maternal depression, maternal age. 3) Figures are standardised coefficients. 4) + p<.10, *p<.05, ** p<.01, ***p<.001. 5) Ratio of observations to free parameters: 720:144 = 5:1

Table 5.7.1: Direct, indirect, and total effects from warmth and effective management age 2-3, to child externalising age 3, 4, 5 and 7.5 (standardised coefficients)

		Warmth age 2-3 predicting				**Effective management age 2-3 Predicting**			
		Externalising				**Externalising**			
		Age 4	**Age 4**	**Age 5**	**Age 7.5**	**Age 3**	**Age 4**	**Age 5**	**Age 7.5**
			β	**β**	**β**		**β**	**β**	**β**
Direct effect		-.07ns	-.07ns	**-.26*****	-.06ns	**-.14***	-.10ns	**.19****	-.03ns
Indirect effect			-.04ns	-.07+	-.18+		**-.07***	**-.12****	-.03ns
Specific indirect	**Ext 3**		-.04ns	-.02ns			**-.07***	**-.05***	
	Ext 4			-.03ns	-.02ns			-.04ns	-.03ns
	Ext 5				**-.12*****				**.09****
	Ext 3, Ext 4			-.01ns	-.01ns			**-.03***	**-.02***
	Ext 3, Ext 5				-.01ns				**-.02***
	Ext 4, Ext 5				-.01ns				-.02ns
	Ext 3, Ext 4, Ext 5				-.007ns				**-.01***
	Warmth 5				.008ns				
	Effective management 5								-.01ns
Total effect		-.07ns	-.11+	**-.32*****	**-.24****	**-.14***	**-.17***	.07ns	.006ns

Notes: Control variables in models are: child behaviour age 2, intervention group, gender of child, parent race, parent education, income, parent depression, parent age. + p<.10, *p<.05, ** p<.01, ***p<.001

5.7.2. Warmth and effective management predicting child internalising

Results of analysis of parental effective management and warmth at age 2-3 and at age 5, as predictors of child internalising problems at age 3, 4, 5, and 7.5, are presented in Figure 5.7.2. The overall fit of this model was good (RMSEA = .030; CFI = 0.956; TLI = 0.939; WRMR = .875).

Early parental warmth at age 2-3 predicted lower child internalising at age 5 (β = -.18, p<.05), this was independent of effects of covariates, and of age 5 warmth, and effective management at both time points. There were no other direct effects of early parental warmth on internalising outcomes. In terms of indirect effects of early parental warmth, reported in Table 5.7.2, none of these were significant, although these still contributed to total effects on child internalising at age 5 (β = -.23, p<.01), and at age 7.5 (β = -.17, p<.05) for which here was a specific indirect effect through age 5 externalising. Note that there were no indirect effects through parental warmth at age 5, which suggests that the effect of early warmth was

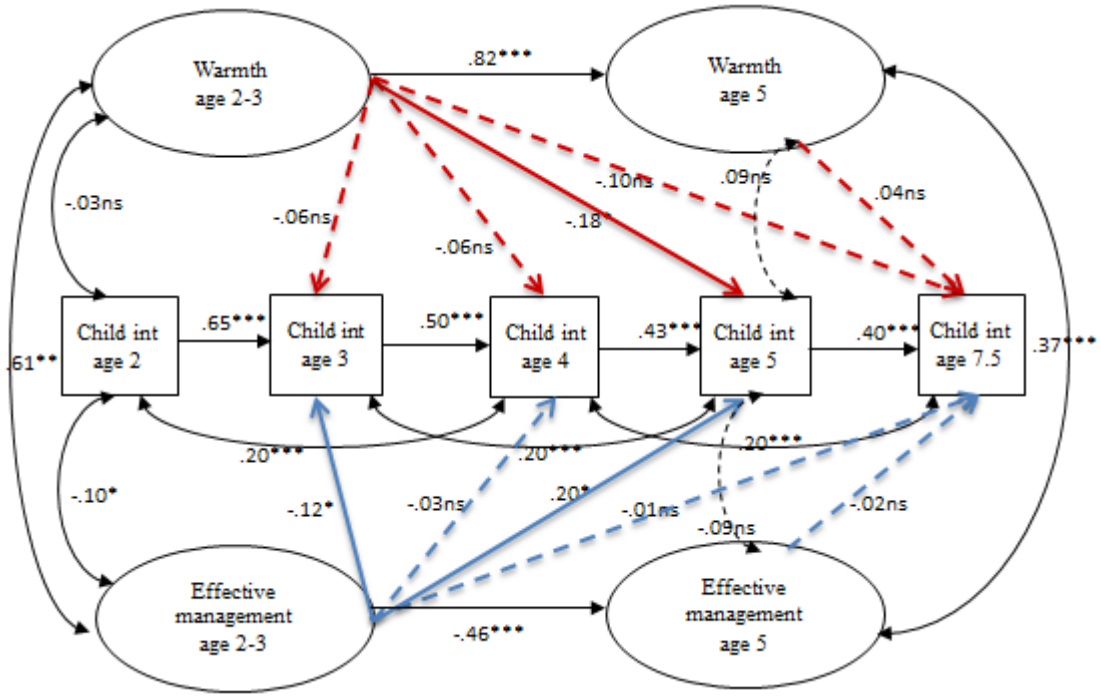
not mediated through the measure of later parental warmth. Neither did parental warmth at age 5 predict concurrent or longitudinal child internalising at age 7.5.

Next are the results of early effective management at age 2-3 as a predictor of child internalising outcomes, whilst controlling for effective management at age 5, for early and later parental warmth, and for covariates. These results are shown in the bottom part of Figure 5.7.2. Higher levels of early effective management at age 2-3 predicted lower levels of child internalising problems at child age 3 (β = -.12, p<.05) but not at age 4. At child age 5 the relationship had reversed, meaning that higher levels of early effective management directly predicted higher levels of child internalising problems (β = .20, p<.05). Internalising problems at age 7.5 were not predicted by age 2-3 effective management.

With respect to indirect effects of effective management at age 2-3, shown in Table 5.7.2, there were indirect effects on internalising at age 4 (β = -.06, p<.05) and at age 5 (β = -.07, p<.05). Similar to results for externalising, specific indirect effects on age 7.5 internalising showed a mix of both positive and negative coefficients. Through internalising age 5 there was an indirect effect of early effective management predicting higher levels of internalising at age 7.5. This was countered by other specific indirect effects via effects on prior child internalising that predicted lower child internalising at age 7.5. Overall, in terms of total effects, higher levels of early effective management predicted lower child internalising at age 3 (β = -.12, p<.05), but at age 4, 5 and 7.5 there were no total predictive effects.

In terms of later effective management at age 5, this was not significantly associated with concurrent child internalising, nor did it have longitudinal predictive effects on child internalising at age 7.5.

Figure 5.7.2: Results of longitudinal model of parental warmth and effective management as predictors of child internalising



Model fit: RMSEA = .030; CFI = 0.956; TLI = 0.939; WRMR = .875

Notes: 1) Latent variable indicators are not shown. 2) Covariates are intervention status, child gender, parent race, parent education, income, parent depression, parent age. 3) Figures are standardised coefficients. 4) + p<.10, *p<.05, ** p<.01, ***p<.001, 5) Ratio of observations to free parameters: 720:138 = 5:1

Table 5.7.2: Direct, indirect, and total effects, from warmth and effective management age 2-3, to child internalising age 3, 4, 5 and 7.5 (standardised coefficients)

		Warmth age 2-3 predicting				**Effective management age 2-3 predicting**			
		Internalising				**Internalising**			
		Age 3	**Age 4**	**Age 5**	**Age 7.5**	**Age 3**	**Age 4**	**Age 5**	**Age 7.5**
		β	**β**	**β**	**β**	**β**	**β**	**β**	**β**
Direct effect		-.06ns	-.06ns	**-.18***	-.10ns	**-.12***	-.03ns	**.19***	-.008ns
Indirect effect			-.03ns	-.05ns	-.08ns		**-.06***	**-.07***	.02ns
Specific indirect	**Int 3**		-.03ns	-.01ns			**-.06***	**-.03***	
	Int 4			-.03ns	-.01ns			-.01ns	-.007ns
	Int 5				**-.07***				**.08***
	Int 3, Int 4			-.01ns	-.006ns			**-.03***	**-.01***
	Int 3, Int 5				-.005ns				**-.01***
	Int 4, Int 5				-.01ns				-.006ns
	Int 3, Int 4, Int 5				-.007ns				-.01*
	Warmth 5				.03ns				
	Effective management 5								-.01ns
Total effect		-.06ns	-.09ns	**-.23****	**-.17***	**-.12***	-.09ns	.13+	.02ns

Notes: Control variables in models are: child behaviour age 2, intervention group, gender of child, parent race, parent education, income, parent depression, parent age. + p<.10, *p<.05, ** p<.01, ***p<.001

5.7.3. Conclusion

In these investigations, early parental warmth and effective management at age 2-3 were analysed simultaneously as predictors of child externalising and internalising outcomes later when children were age 5 and age 7.5, whilst controlling for both of these parenting measures at age 5. Results therefore represent the independent or unique predictive effects of these early aspects of parenting. This allowed a direct comparison of these parenting domains, whilst also testing the significance of early parenting compared to later parenting, in terms of their prediction of child functioning.

In summary, results showed that higher levels of early parental warmth during the toddler years at age 2-3 had little predictive effects on children's short-term externalising and internalising outcomes at age 3 and 4, however in the longer term they predicted lower levels of both conduct and emotional problems at age 5 and 7.5. Results are indicative that there may be sleeper effects of this parenting dimension. In contrast, higher levels of early effective management at age 2-3 predicted lower child externalising problems at age 3 and 4, and lower internalising problems at age 3. However, beyond these ages, in the longer term effective management was unrelated to these child problems.

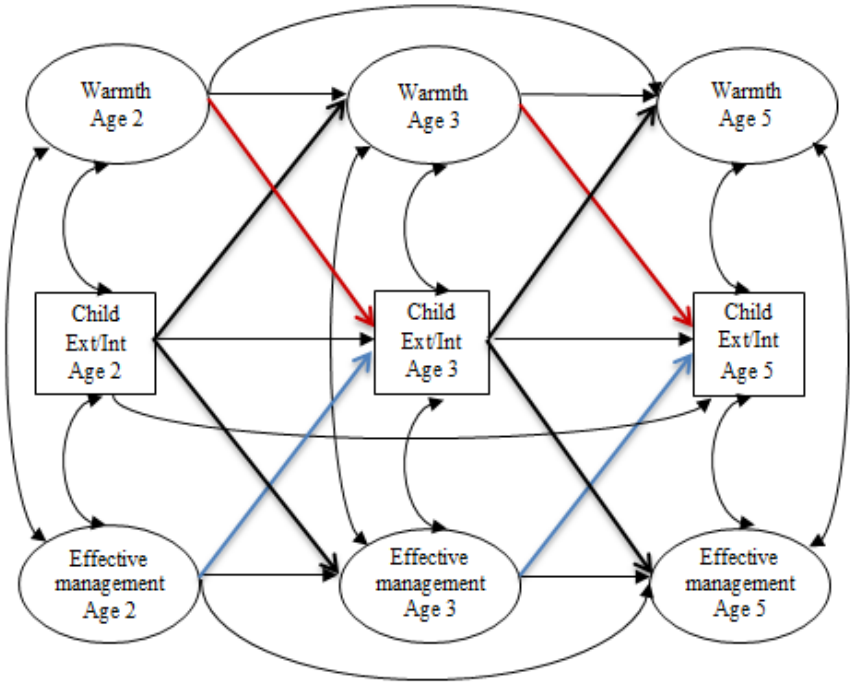
Therefore, overall conclusions from these examinations are that early parenting associated with attachment (warmth) has positive and longer lasting effects on child conduct and emotional problems, compared to early parenting related to social learning (effective management) that has no long-term positive effects on child conduct and emotional functioning.

5.8. Additional analyses: examination of bidirectional effects between parenting and child conduct and emotional functioning

The substantial research questions examined of this study focused on parenting as a predictor of child functioning. However, as touched upon in the background section of this thesis, the parent child relationship should be considered as reciprocal or bidirectional (Bell, 1968; Burke et al., 2008; Lansford et al., 2011; Larsson et al., 2008; Sameroff, 1975). Therefore, as well as testing parenting as a predictor of child functioning, it was examined if child conduct and emotional problems are predictive of parenting behaviours.

For these analyses, early parental warmth and effective management were disaggregated into the original age 2 and age 3 measures, and along with the measures of parenting at age 5, these were entered in autoregressive models. Measures of child externalising and internalising at age 2, 3 and 5 were also included in models auto-regressively, and two-way cross-lagged predictive paths were modelled for all longitudinal relationships between parenting and child behaviour, and between child behaviour and parenting. Concurrent parenting and child behaviour were modelled as correlations. The two theoretical parenting constructs were modelled simultaneously, which means that estimated reciprocal effects are unique effects between each parenting dimension and child outcomes, because the other parenting construct was controlled for. In order to accommodate binary indicators, the WLSMV estimator was used. Both first and second order autoregressive effects were modelled for parenting and child behaviour as this provided a better model fit. The theoretical longitudinal model with bidirectional cross-lagged effects is shown in Figure 5.8.0. Externalising and internalising were examined in separate models.

Figure 5.8.0: Hypothetical longitudinal cross-lagged reciprocal effects between parenting (warmth and effective management) and child externalising and internalising at ages 2, 3, and 5



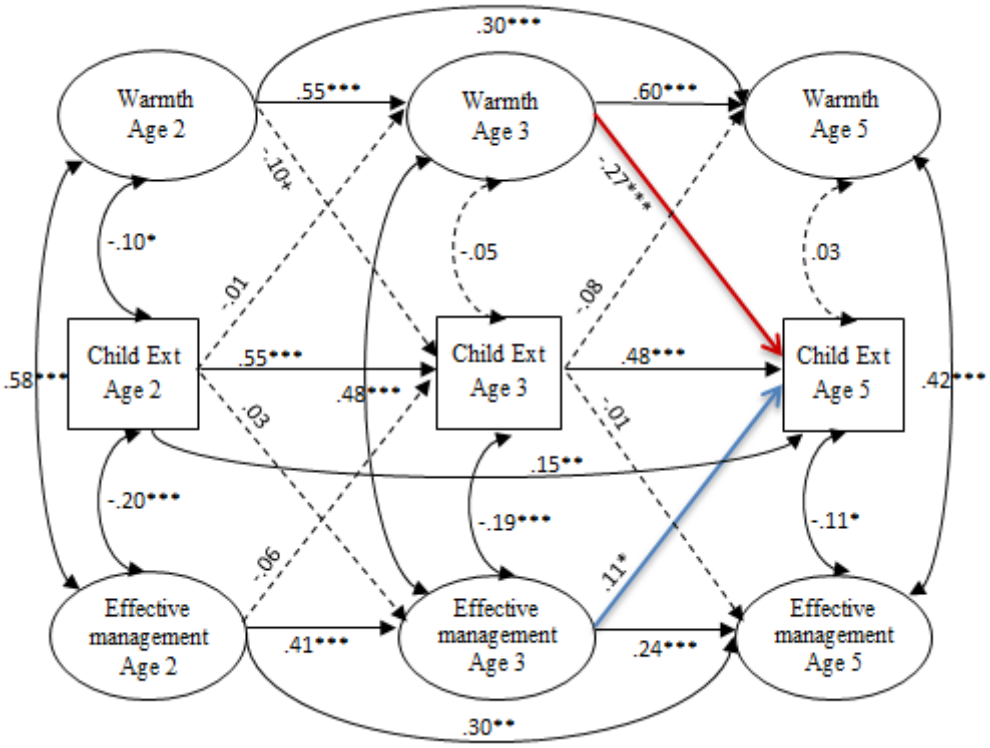
5.8.1. Parenting and child externalising

Results of the examination of bidirectional effects between parenting and child externalising are provided in Figure 5.8.1. The overall fit of this model was acceptable (RMSEA = .029; CFI = 0.942; TLI = 0.925; WRMR = .969).

Estimates showed that there was no longitudinal bidirectional relationship between parenting and child externalising, as none of the measures of child externalising predicted parental warmth or effective management. However, there were significant paths for parenting predicting child externalising. This was between parental warmth at age 3 and child externalising at age 5 (β = -.27, $p<.001$), with higher levels of warmth predicting lower levels of child symptoms. Effective management at age 3 had the direct opposite effect on child externalising behaviour at age 5 by predicting higher levels of these child problems (β = .11, $p<.05$). These results reflect those reported previously for the age 2-3 aggregated parenting measure predicting age 5 externalising.

There were also a number of concurrent correlations between child externalising and parenting, especially for effective management that correlated with child externalising at all three time point (age 2: β = -.20, p<.001; age 3: β = -.19, p<.001; age 5: β = -.11, p<.05), but for parental warmth the only significant concurrent association with child externalising was at age 2 (β = -.10, p<.05). All concurrent correlations were negative, meaning that higher levels of parental warmth and effective management were associated with lower child externalising. However, because these relationships are concurrent, significant care has to be taken in making causal claims as these results could represent parental influences on children as much as they could signify child effects on parenting, or both, as these could signify concurrent reciprocal effects.

Figure 5.8.1: Results of longitudinal cross-lagged reciprocal effects between parenting (warmth and effective management) and child externalising at ages 2, 3, and 5



Model fit: RMSEA = .029; CFI = 0.942; TLI = 0.925; WRMR = .969

Notes: 1) Latent variable indicators are not shown. 2) Covariates are intervention status, child gender, parent race, parent education, income, parent depression, parent age. 3) Figures are standardised coefficients. 4) + p<.10, * p<.05, ** p<.01, *** p<.001. 5) Ratio of observations to free parameters: 720:167 = 4:1

5.8.2. Parenting and child internalising

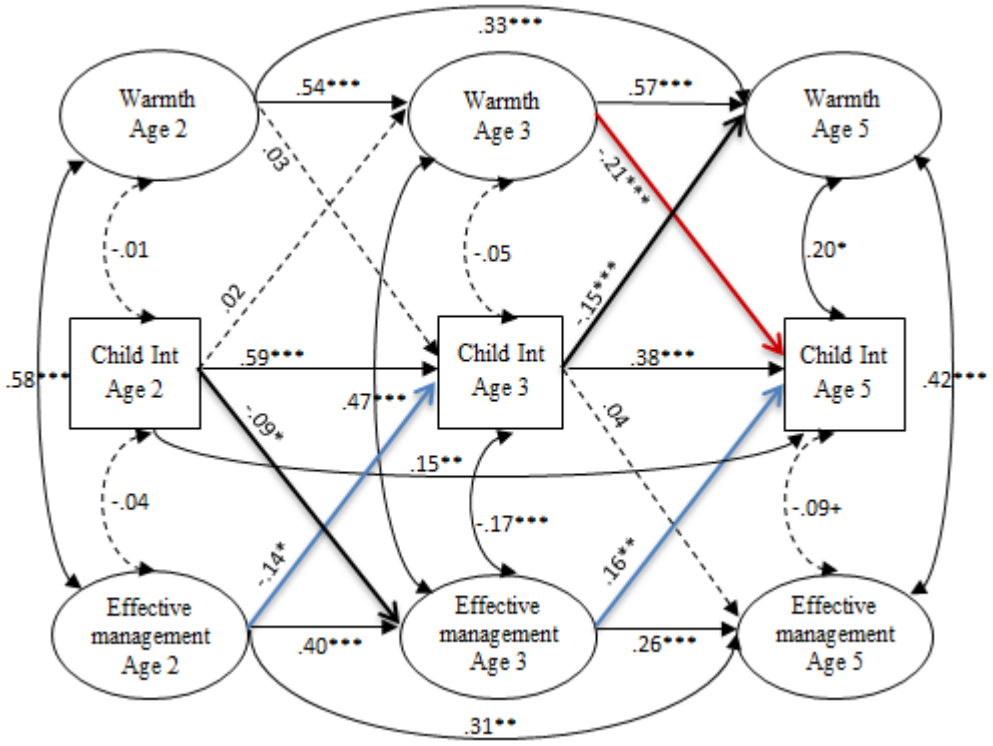
Figure 5.8.2 shows results for the examination of bidirectional effects between parenting and child internalising. Model fit was acceptable (RMSEA = .029; CFI = 0.940; TLI = 0.922; WRMR = .971).

Results indicate that some relationships between parenting and child internalising were bidirectional. Higher levels of child internalising at age 2 predicted lower levels of effective management at age 3 (β = -.09, p<.05), whilst higher levels of effective management at age 2 predicted lower levels of child internalising at age 3 (β = -.14, p<.05). These coefficients indicate that the predictive effect of parenting on child functioning appeared to be slightly stronger than the effect of child internalising on parental effective management. Another bidirectional relationship was between warmth and child internalising. Higher levels of child internalising problems at age 3 predicted lower levels of parental warmth at age 5 (β = -.15, p<.001), whilst high parental warmth at age 3 predicted less internalising problems at age 5 (β = -.21, p<.001). Also these coefficients indicate that parenting was a stronger predictor of child behaviour than effects in the direction from child behaviour to parenting. There was a significant predictive path between effective management at age 3 and child internalising at age 5 (β = .16, p<.01), which mirrored the results reported for the aggregated parenting measures at age 2 and 3, showing that higher levels of effective management predicted higher levels of child internalising symptoms. However, this relationship was not bidirectional as child internalising at age 3 did not predict effective management at age 5.

In addition to the cross-lagged relationships, there were some concurrent relationships between parenting and child internalising. At age 3, more effective management correlated with less internalising problems (β = -.17, p<.001), and at age 5 higher warmth correlated with more internalising problems (β = .20, p<.05). As noted above,

care should be taken in making any causal claims in relations to these concurrent associations as it is difficult to interpret the direction of these associations, and they may to some extent represent concurrent reciprocal effects.

Figure 5.8.2: Results of longitudinal cross-lagged reciprocal effects between parenting (warmth and effective management) and child internalising at ages 2, 3, and 5



Model fit: RMSEA = .029; CFI = 0.940; TLI = 0.922; WRMR = .971

Notes: 1) Latent variable indicators are not shown. 2) Covariates are intervention status, child gender, parent race, parent education, income, parent depression, parent age. 3) Figures are standardised coefficients. 4) + p<.10, *p<.05, ** p<.01, ***p<.001.
5) Ratio of observations to free parameters: 720:167 = 4:1

5.8.3. Conclusion

Child emotional and conduct problems were examined as predictors of parenting in order to study reciprocal or bidirectional effects. Results showed that, whilst both warmth and effective management predicted child externalising problems longitudinally, there was no evidence for child externalising evoking these parenting behaviours over time. Although, concurrently there may be reciprocal effects of child externalising mainly in relation to

parental effective management, with higher levels of parenting being associated with lower child externalising, but whether these associations are parent or child driven, or both, cannot be established. On the other hand, child internalising problems seemed to have effect over time on parenting behaviour with higher levels of internalising predicting lower parental warmth. Although, these relationships were bidirectional as higher parental warmth also predicted lower child internalising, and parenting effects were larger in magnitude than effects of child internalising on parenting. The significant concurrent association between higher child internalising and higher parental warmth at early school age indicated that child internalising at early school age may induce higher levels of parental warmth, although it is also possible that parenting could be influencing child internalising symptoms.

Overall finding suggest that child externalising does not appear to evoke parenting behaviours longitudinally, however concurrently there may be reciprocal effects mainly in relation to parental effective management. On the other hand, child internalising problems seemed to have effects over time on parenting behaviour, although parenting was a more dominant factor as there were larger parenting effects than child effects.

CHAPTER 6: Discussion

This study contributes to our knowledge of early positive parenting as a predictor of child emotional and behavioural functioning. Using a large longitudinal sample of children and observed measures of parenting, it examined and compared two dimensions of positive parenting based on the theoretical frameworks of attachment theory (Bowlby, 1958, 1969, 1988; Ainsworth et al., 1978) and social learning theory (Gardner, 1987; Patterson, 1982). Both theories speak to how parenting is influential in child development, but they propose different mechanisms for how parenting impacts child outcomes. Furthermore, drawing on theories proposing that both theoretical dimensions of parenting play a role in child development (Baumrind, 1966, 1971; Richters & Waters, 1991; Shaw & Bell, 1993), this study tested interactions between these aspects of parenting as predictors of child outcomes. This study therefore contributes to our understanding of how aspects of early parenting may work together in predicting child conduct and emotional problems.

Few previous studies have explicitly compared positive parenting associated with attachment theory and social learning theory. By modelling these theoretical aspects of parenting simultaneously, this study tested the unique predictive effect of these parenting dimensions. Another major limitation of previous studies is that parenting has been examined in relation to children's concurrent or short-term outcomes, and very little is known about how these parenting dimensions compare in term of predicting child outcomes more longitudinally. This study examined early parenting (age 2-3) in relation to child conduct and emotional problems across several child ages (age 3, 4, 5 and 7.5), meaning that both short-term and longer-term effects of early parenting were studied. Furthermore, early parenting was examined alongside later parenting in order to test whether early positive parenting has enduring effects, or whether children's early experience are revised and

overshadowed by later parenting experiences (Fraley et al., 2013). This study also provided additional analyses that tested reciprocal or bidirectional relationships between parenting and child conduct and emotional problems, as it is acknowledged that children can play an active role in shaping their rearing environment, which in turn can affect child functioning (Bell, 1968; Belsky, 1984; Sameroff, 1975). This study is one of the few studies that have looked at bidirectional relationships between parenting and child internalising problems.

Results of findings presented in the previous chapters are discussed in the following. First results of preliminary analyses are discussed, including children's trajectories of problems over time, and continuity and comorbidity of child conduct and emotional problems. Also continuity of parenting and the relationship between the two theoretical parenting constructs are discussed. This is followed by a discussion of the results of the main research questions comparing associations between early positive parenting and child outcomes. Implications of study findings for parenting interventions are highlighted. The strengths and the limitations of the study are outlined, and suggestions are made for further research to advance knowledge in the field.

6.1. Trajectories of child problems

Examinations of trajectories of child problems from age 3 to age 7.5, measured on the CBCL (Achenbach & Rescorla, 2000, 2001), showed that mean levels of both externalising and internalising problems tended to decrease across time. The pattern of decreasing levels of child externalising problems is consistent with previous studies (Bongers et al., 2003; Miner et al., 2008; Leve et al., 2005; Owens & Shaw, 2003). As for child internalising problems, previous studies using the CBCL have generally shown a more stable but gradual increase in these problems from early childhood and onwards (Bongers et al., 2003; Fanti & Henrick; 2010; Gilliom & Shaw, 2004; Leve et al., 2005), and findings in the current study are

therefore not congruent with this previous body of research. However, it is important to note that the current study sample represents a relatively high risk group where the pattern of change in emotional problems may be different than in community samples (Bongers et al., 2003; Fanti & Henrick; 2010; Leve et al., 2005). Although the study by Gilliom & Shaw (2004), with a sample (N=303) of disadvantaged boys followed from age 2 to 6, also showed increasing levels of CBCL internalising problems during childhood.

The current study showed a general pattern of decline in both externalising and internalising problems from age 3 to 7.5, but the rate of decline appeared to be steeper at age 5, which was then followed by a slight increase from age 5 to age 7.5. This dip in the growth curve at age 5 might be due to the change from the CBCL/1.5-5 to the CBCL/6-18. Children may have been too young to switch to this measure, which has slightly different items and scales that measure more severe externalising and internalising symptoms, making it more suitable for older children. The pattern at age 5 was seen for both the intervention and the control group so it seems unlikely to be due to intervention effect.

6.2. Continuity of child problems

Bivariate correlations of study variables, followed up by logistic regression analyses, highlighted the continuity of both child emotional and behavioural problems from toddlerhood to school age. Children who experienced clinical levels of conduct or emotional problems earlier in development were much more likely to continue to also experience these problems later on. This is consistent with previous research (Bufferd et al., 2012; Campbell & Ewing, 1990) showing that earlier problems are predictive of problems at later developmental stages, where problems may also have escalated. It is perhaps not surprising that child problems tend to persist over time as children in many cases will continue to experience the risk factors associated with these problems (Campbell et al., 2000). These are

risks related to individual child factors, and to family and social factors. At the child individual level it is recognised that there are genetic and heritable factors at play, which has been evidenced empirically using designs such as twin studies that have demonstrated that heritability accounts for a significant amount of variance in both child externalising and internalising symptoms (Bergen et al., 2007). In the current study, child behaviour at age 2 was included as a control variable in all analytical models in order to take account of individual child effects. As expected, it was found that children's externalising and internalising problems at age 2 was a large and significant predictor of these problems at later developmental stages. These findings are therefore consistent with the current body of research that has indicated a strong heritable aspect of human behaviour. Although, the predictive effect of baseline level of problem behaviour may not be entirely due to direct heritability. It could be caused by earlier parenting practices impacting child functioning that carry on influencing later child outcomes. Or it could be a result of child behaviour eliciting parenting behaviour that in turn impacts child functioning (Bell, 1968).

6.3. Comorbidity of child problems

This study found a strong concurrent correlation between child externalising and internalising scores at each assessment age. These analyses were followed up by logistic regressions that examined the comorbidity of clinical levels of conduct and emotional problems, and which showed that children with externalising problems were much more likely to also experience internalising problems. This is congruent with results from previous studies that have shown a high level of comorbidity between emotional and behavioural problems in children (Angold et al., 1999; Rohde et al., 1991). Furthermore, comorbidity was found to increase as children aged, which is a finding that is consistent with the existing research literature (Boylan et al., 2007). Comorbidity of child externalising and internalising

problems may be due to shared underlying risk factors (Bubier et al., 2009; Hudson & Rapee, 2005; Wertz et al., 2015). Other explanations may be that internalising plays a causal role in externalising, or vice versa that externalising causes internalising (Lilienfeld, 2003; Boylan et al., 2010; Reef et al., 2010). In this study it is important to acknowledge possible methods effects because child conduct problems and emotional problem were both measured using parent reports on the CBCL (Lilienfeld, 2003). This means that any parental positive or negative perceptual bias may have influenced externalising and internalising outcomes in the same direction, and therefore their correlation may to some extent be driven by overlapping method. Although many previous studies that have used methods for assessing child mental health functioning that are less prone to this kind of bias, such as structured psychiatric interviews and multiple-informants reports, have also found comorbidity between child conduct and emotional problems (Angold et al., 1999).

6.4. Continuity of parenting

In this study, parents showed consistency in their parenting between age 2-3 and age 5. Continuity was especially high for warmth), whereas for effective management it was more modest. A reason for the difference in continuity between these theoretical parenting constructs could be that warmth may be reflective of a personality trait, whereas effective management may be a skill that parents learn and develop. If this is the case, warmth is also likely to me more heritable and effective management less so.

6.5. Correlation between theoretical parenting constructs

There was a moderate to high degree of correlation between the two parenting constructs both at age 2-3 and at age 5. This was despite that these constructs were measured by

different instruments (HOME and COIPM) and used different reporters (home visitors and video coders). Furthermore, there was no item cross-loading between constructs, as any cross-loading items had been removed when creating these parenting constructs in order to separate measures, and allow for a clearer comparative analysis of these aspects of positive parenting. The correlation between the two theoretical parenting constructs found in this study was however expected as they both constitute positive parenting. As suggested by O'Connor (2002), parents high in warmth are likely to also manage their children more effectively. Other studies that have examined parenting related to attachment and social learning have found comparable correlations between these theoretical aspects of parenting (Matias, 2006b; O'Connor et al., 2013).

6.6. Validity of parenting constructs

Both of the parenting measures used in this study, which were global assessments of parenting using the HOME and the COIMP, showed modest to moderate correlations with the micro-social measure of overall positive parenting that was assessed using the RACS. This measure was part of the original Early Steps study, but was not used in the current examinations. These correlations are indicative that the parenting measures of warmth and effective management used in the present study have convergent validity with other measures of positive parenting. The global measures of positive parenting demonstrated good predictive validity by showing significant association with 7 out of 8 assessments of child internalising and externalising from toddler age through to school age. This was compared to the micro-social measure that was associated only with two of these child outcomes. The reason for the global measures performing better predictively may be because the observers (video coders and home visitors) base their ratings on their overall or global impressions of parent child interactions, which may pick up more nuances of parenting than

those operationalised and captured in the RACS. The seemingly better predictive validity of the global measures of positive parenting has important implications for research on parenting, both in child developmental studies and in intervention studies where parenting is manipulated.

6.7. Results of main findings

6.7.1. Comparing warmth and effective management as predictors of child outcomes

The main objective of this study was to compare early positive parenting 'warmth' and 'effective management', related to attachment theory and social learning theory respectively, as predictors of child conduct and emotional problems. Many of the analytical models in this study were useful initial steps where warmth and effective management were explored separately as predictors of child outcomes. However, the most important results are those that provided a direct comparison between the two aspects of parenting by examining their unique predictive effect on child outcomes. These are based on analytical models where both theoretical parenting aspects were entered simultaneously, which were reported in relation to research questions 3 and 7. These are the results summarised and discussed here.

Overall results of these comparative models showed that both parenting dimensions were predictive of child conduct and emotional problems. However, the two theoretical parenting constructs had little simultaneous association with child behavioural and emotional outcomes, but instead they predicted child functioning at different times across the developmental period from toddlerhood to early school age. More specific results are summarised in the following.

A higher level of early effective management at age 2-3 predicted lower levels of child externalising at age 3 and 4, but was unrelated to externalising outcomes at age 5 and

7.5, and it predicted lower levels of internalising problems at age 3, but not at age 4, 5 and 7.5. This trend of effective management showing an attenuating association with child outcomes over time was further demonstrated in trajectory analysis. These showed that early effective management at age 2-3 was predictive of a lower intercept of both externalising and internalising, so less initial problems at age 3, but it then predicted a slower decrease in both of these symptoms from age 3 to 7.5. In the autoregressive models that included all parenting and child measures across time, it was demonstrated how longitudinal effects of early effective management operated through direct effects that predicted more child problems, combined with indirect effects through earlier effects on child functioning that continued to predict less child problems later on. This means that although effective management at an early age was associated with better child functioning that continued to carry on positively influencing later child outcomes, later there were direct effects associated with worse conduct and emotional functioning.

Quite a different pattern was found for warmth. Early parental warmth at age 2-3 was unrelated to child externalising at age 3, and to internalising at age 3 and 4, but over time effects became apparent, as higher levels of parental warmth predicted less child externalising problems at age 4, 5 and 7.5, and less internalising problems at age 5 and 7.5. Trajectory analyses reflected these initial analysis by showing that warmth at age 2-3 was not a significant predictor of the intercept of externalising (initial child problems at age 3), but higher parental warmth then predicted a more rapid decrease in externalising problems from age 3 through to age 7.5. Parental warmth was unrelated to the internalising intercept (child internalising at age 3) and neither was there a significant effect on the rate of change of child internalising symptoms over time. Autoregressive models, which included all measures of repeated measures of parenting and child outcomes, demonstrated how early parental warmth directly predicted child externalising and internalising at age 5 child, and at

age 7.5 effects were mediated through age 5 child outcomes. So for early warmth, both the direct and indirect effects on children's outcomes at school age went in the same direction, with higher scores on this dimension of parenting predicting less child externalising and internalising problems. Overall, the results of this study, in terms of the main effects of the two parenting dimensions, suggest that early parenting related to attachment theory (warmth) constitutes a more promising parental strategy in terms of children's longer term behavioural and emotional functioning.

It was unexpected that the social learning parenting aspect, effective management, was found to have a positive impact on child functioning only in the shorter term and not long-term. Equally, it was surprising that parental warmth did not predict earlier but only later child outcomes, considering that this parenting dimension draws on attachment theory, which is strongly associated with infancy and the first two years of life (Erikson, 1950). However, some sense of these study results might be made by considering the respective mechanisms that are proposed to underpin the relationship between parenting practices and child functioning in these theoretical frameworks. Attachment theory emphasises internal and emotional processes (internal working models), which may be slow to develop but more enduring. On the other hand, social learning theory operates within the framework that behaviours are driven largely by external motivations and inspirations (reward, punishment, modelling), and it is conceivable that these mechanisms are relatively instantaneous but short lived.

6.7.2. Testing theoretical models combining attachment and social learning

This study also tested other theoretical models that combine attachment theory and social learning theory in terms of explaining the development of child conduct and emotional problems, as expressed in several variants of parenting theory. The *authoritative parenting*

style, proposed by Baumrind (1966, 1967), involves a high level of competency in both attachment and social learning related parenting. In a similar vein, Richters and Waters (1991) suggested that attachment aids the socialisation (social learning) process, which in the current study is referred to as the *motivational model*. In order to test these models, a concurrent interaction between early warmth and early effective management was examined as a predictor of child internalising and externalising outcomes. Another model that incorporates both theoretical dimensions is the risk model approach (Greenberg et al., 1993), which proposes that a lack of early attachment and later deficient social learning processes are risk factors that both contribute to child behavioural problems. In order to test this model it was examined if there were predictive effects of both early warmth and later effective management. Lastly, in the bridging model by Shaw and Bell (1993), it was proposed that children who are securely attached in infancy are less likely to develop coercive cycles of interactions with their caregivers later in development, and they are therefore less likely to develop conduct problems. In the current study this was examined by testing an interaction between early positive parenting related to secure attachment (warmth) and positive parenting thought to prevent coercive cycles (effective management) as a predictor of child outcomes.

Results of these examinations showed that there was only partial support for the hypothesis that the two parenting dimensions at age 2-3 interact in predicting child adjustment (Baumrind, 1966, 1967; Richters & Waters, 1991). The analyses of individual assessment points showed no evidence that being a warm parent, and at the same time being an effective manager, was of further benefit to children's behavioural and emotional functioning, in addition to the respective main effects of these two parenting dimensions. Although the trajectory analyses, which investigated the change in child functioning over time, showed that early warmth coupled with early effective management predicted a faster

decrease in children's internalising symptoms but not externalising. Therefore, child developmental theories that imply an interaction between attachment and social learning aspects of parenting appear to apply to emotional problems more than to conduct problems. It would have been expected to also find an interactive effect for conduct problems, as the Richters & Waters (1991) motivational model was formulated specifically in relation to the development of antisocial behaviour and not emotional problems. In Baumrind's typology of parenting she applies the benefits of the authoritative parenting style to both children's behavioural and emotional adjustment – 'thus, the controlling parent who is warm, understanding, and autonomy-granting should generate less passivity (as well as less rebelliousness)…' (Baumrind, 1966, p. 889).

In relation to the risk model (Greenberg et al., 1993), results showed no support for this. In models that included both early warmth (age 2-3) and later effective management (age 5), only warmth was associated with less child externalising and internalising problems at age 5 and 7.5.

In terms of the bridging model (Shaw and Bell, 1993), study results were supportive of this model, as it was found that an interaction between higher level of early parental warmth at age 2-3 and higher levels of effective management at age 5 predicted lower levels of child conduct and emotional problems at age 5, but not at age 7.5. This interaction effect was slightly larger for externalising- than for internalising problems. Because there were no main effect of effective management at age 5 in these analyses, results suggest that only if accompanied by early parental warmth does effective management at school age have association with child outcomes; although this only applied to concurrent child outcomes at age 5 and not to longer-term child functioning at age 7.5. The bridging model was concerned primarily with child conduct problems, so the interaction effect seen for internalising is indicative that this developmental model is applicable also to emotional aspects of child

problems. Alternative models with interaction between early and later parenting were also tested, as it is conceivable that the interaction effect between early and later parenting may reflect a continuity of positive parenting that is unrelated to any underlying theories. Results of running all possible combinations of early and late parenting showed that these alternative interactions were not predictive of child behavioural or emotional functioning. Therefore, the only linkage between earlier and later parenting associated with child outcomes was the relationship between early warmth and later effective management, as predicted in the bridging model.

6.7.3. Early parenting and sleeper effects

The salience of early parenting was tested further in autoregressive longitudinal models that included early parenting at age 2-3 and later parenting at age 5. This tested the model of *enduring effects* versus a *revisionist* perspective (Fraley, 2013). Results showed that none of the effects of early warmth or early effective management on longer term outcomes were mediated by more concurrent parenting. Therefore, findings in this study indicate that early parenting experiences having enduring effects (Fraley & Roberts, 2005; Sroufe et al., 1979, 1990), which has also been demonstrated in previous research (Afifi et al., 2008; Anda et al., 2006; Chapman et al., 2004; Fraley et al., 2013; Haltigan et al., 2013; Raby et al., 2015; Vandell et al., 2010). Moreover, the current study findings are especially interesting as they indicate that in relation to parental warmth there seems be what Kagan and Moss (1962) termed ‘sleeper effects’. This is to be regarded as a special case of enduring effects, as the relationship between parental warmth and child outcomes not only endures but grows stronger over time (Fraley et al., 2013). Bronfenbrenner (1979) proposed that developmental effects are most likely to manifest when individuals move from their primary setting to another, where they get the opportunity to demonstrate how they function more

independently. Children's behavioural skills are put to the test in a real world setting, and influences of the earlier environment can be more truly assessed. In the current study, there was a marked increase in the association between parental warmth and child internalising and externalising outcomes at age 5. At this age, many children in the sample would have started school and would have experienced a new setting with the opportunity for testing their social and behavioural skills. Bronfenbrenner's hypothesis may therefore explain the timing of the sleeper effect of parental warmth found in this study. An alternative explanation for the increased association between early warmth and child functioning at age 5 could be because of gene and environment correlation getting stronger over time as research has indicated. This would be especially plausible if warmth is a heritable personality trait, as noted previously. However, although the heritability of behaviour increases with age, it is not until adolescence that this increase becomes marked (Bergen et al., 2007). Therefore, the strengthened relationship between early warmth and child functioning at age 5 is unlikely to be driven purely by genetic influences and may represent a genuine environmental sleeper effect.

Although, as pointed out by Clarke and Clarke (1981), researchers must be cautious about interpreting their findings as sleeper effects as there are other possible explanations for these effects. They suggest three models of alternative explanations: 1) *The intervening variable model,* where early parenting characteristics or behaviour may be correlated with later behaviours that are more directly related to child outcomes; 2) *The random fluctuation model,* where sleeper effects are naturally occurring fluctuations; and 3) *The insensitive measurement model,* where sleeper effects are an artefact of using an insensitive measurement at one time but not at another. It is useful to discuss to what extent these alternative explanations might apply to findings in the current study.

In relation to the intervening variable hypothesis, results of bivariate correlations showed that early parental warmth at age 2-3 was highly predictive of later warmth at age 5 (r=.69), whereas for effective management the correlations between earlier and later parenting was somewhat lower (r=.33). It might be the case that early warmth is most strongly associated with later child outcomes because of the high continuity of this parenting measure across time, and that later warmth more concurrent with child outcomes has a more causal effect. However, in models in this study where parental warmth was included as a predictor both at age 2-3 and at age 5, early warmth was still predictive of child conduct and emotional problems at age 5, but later and more concurrent parental warmth was not predictive of these outcomes. This suggests that parental warmth in early childhood is more critical than later parenting. In terms of the possibility that the sleeper effects found in this study were merely random fluctuations, child outcomes were examined across several time point (age 3, 4, 5 and 7.5), with results indicating a relatively steady increase in the association between warmth and child functioning rather than fluctuations from year to year.

Lastly, the measurement insensitivity hypothesis is a real possibility in the current study, as the CBCL changed at age 5 to the age 6-18 version, replacing the age 1.5-6 version that was used for assessing early child outcomes at age 3 and 4. Slightly different items and subscales make up the broadband externalising and internalising scales in these two versions, although these adjustments are necessary in terms of child development, as problematic behaviours in children are manifested slightly differently in younger than in older children. However, examining the continuity of these measures through bivariate correlations, it was found that there was largely the same continuity between age 3 and age 4 externalising behaviour (r=.69), which were measured using the same version of the CBCL, as there was between age 4 and age 5 externalising (r=.65), which were measured using different versions of the CBCL. For internalising, the correlation between internalising at age 3 and age 4

(r=.66) was slightly larger than between age 4 and age 5 internalising (r=.56). This means that for internalising there was less continuity between the time points that used different CBCL instruments, although continuity was still fairly high. In terms of the measure of parental warmth, there was no difference in the way that observed warmth was measured at age 2-3 and at age 5. Although early warmth was an aggregated measure based on assessments at age 2 and age 3, whereas the measure at age 5 was based on a single assessment. For this reason, the aggregated measure might be a more robust and a more valid measure of parenting as mentioned previously in the chapter outlining methods, and therefore be more predictive of child outcomes. Still, this does not explain why early parental warmth is more predictive of later child outcome than of earlier concurrent and more proximate outcomes. Furthermore, in examinations of bidirectional effects, where there was no aggregation of early parenting, parenting at age 3 still showed effects on child outcomes at age 5 over and above concurrent parenting.

The indicated sleeper effect shown in this study may therefore represent a genuine effect rather than an artefactual one. The question of why parenting behaviour such as warmth appears to have sleeper effects, whilst effective management does not, might be best explained by the underlying *internal* versus *external* mechanisms of how these respective parenting dimensions influence child outcomes, as discussed previously.

Whilst many longitudinal studies have reported enduring effects of early childhood experiences, as listed above, few have demonstrated sleeper effects of parenting on child conduct and emotional problems. However, in an early meta-analysis that examined family factors as correlates and predictors of juvenile conduct problems and delinquency, possible sleeper effects of parenting were found, which applied especially to parental supervision and parental rejection (Loeber & Stouthamer-Loeber, 1986). This was based on the finding that correlations between parenting and child outcomes were larger for studies using longitudinal

analysis than for studies examining concurrent associations. For studies that used longitudinal designs, the largest correlations between parenting and child delinquency were: parental rejection, parent-child involvement, and supervision; whilst the weakest effects were for parental discipline and parental absence. The parenting aspects yielding the strongest longitudinal effect sizes were therefore those aspects closely associated with parent-child attachment. This is bearing in mind that parental supervision can be considered relationship- and attachment related as discussed previously in Chapter 2. However, in a more recent meta-analysis that provided an update of the previous one, the time interval between measurement of parenting and child outcome did not moderate the relationship between these variables, meaning that this meta-analysis found no support for sleeper effects (Hoeve et al., 2009). Although these meta-analyses are useful in providing some comparison of concurrent and longitudinal effects, they are also limited in the sense that earlier and later child outcomes are not examined *within* the same study but comparisons are made *between* studies. In order to properly examine sleeper effects, there must be at least two assessments over time of the outcome variable, although multiple measurements would be preferred in order to assess that a sleeper effect is not merely a random fluctuation. The concept of sleeper effects also implies that these occur over a relatively wide developmental period, so measurements points would need to be across several years, although the literature applies no formal criteria for this.

6.7.4. Previous research

It is important to discuss not only how these findings correspond with theoretical frameworks, but also how congruent they are with previous research. It is difficult to directly compare results from the current study with the systematic reviews and meta-analyses that examine the association between parenting and child externalising problems (Hoeve et al.,

2009; Rothbaum & Weisz, 1994) and child internalising problems (McLeod et al., 2007a, McLeod et al., 2007b). This is because these reviews report overall findings across studies that mostly use cross-sectional rather than longitudinal prospective designs.

Another significant problem is that not many studies directly compare attachment and social learning related parenting. Some of the few studies that have made such comparisons were outlined previously in Chapter 2. The study of the 'New Beginnings' intervention for divorcing families is unique in the sense that it followed up the sample of children (aged range 9 to 12 years) over a long period of time and examined parenting mediators related to attachment and social learning theories (Tein et al., 2004; Wolchik et al., 2000; Zhou et al., 2008). Results showed that intervention effect at 6 months follow-up on reduced child externalising was mediated by improvement in mother-child relationship and parental discipline, and a reduction in internalising was mediated by intervention induced changes in the mother-child relationship. Long-term follow-up 6 years later found that, for high risk children, reductions in both their externalising and internalising problems were mediated by early improvement in the mother-child relationship but not by parental discipline. Therefore, this study was also indicative that positive social learning related parenting practices are relatively short lived, in comparison to attachment aspects that have longer lasting effects on child conduct and emotional functioning.

6.8. Results of additional analyses

6.8.1. Bidirectional effects

Child emotional and conduct problems were examined as predictors of parenting in longitudinal cross-lagged models in order to study reciprocal or bidirectional effects (Bell, 1968; Belsky, 1984; Sameroff, 1975). Parenting practices and child externalising and internalising problems were measured at three points in time at child age 2, 3 and 5.

As for child externalising problems and parenting, results showed that, both warmth and effective management predicted child externalising problems longitudinally, but there was no evidence of child externalising problems predicting these dimensions of parenting at later time points. In terms of how these results align with previous research on longitudinal bidirectional relationships, there is some consistency. For example the study by Lansford et al. (2010) that examined parent physical discipline and child externalising, reported only parent-to-child effects in their sample of low income boys followed from age 10-15. Also the study by Schaffer et al. (2013) failed to show consistent effects of child externalising on parenting as only 1 out of 5 tests were significant, although there were no effects of parenting on child externalising either. However, it is important to highlight that the empirical literature in this area is somewhat inconsistent as outlined previously in Chapter 1 of this thesis. There are studies that have found that child externalising predicts multiple aspects of parenting whilst finding few parenting effects on child functioning (Burke et al., 2008). Other studies have found child and parenting effects to be fairly equal in magnitude (Pardini et al., 2008; Larsson et al., 2008). On the other hand, Lansford et al. (2010) reported only parent effects in one sample, but in another sample analysis of the same variables showed both child and parent effects.

In the current study it was also found that there were concurrent relationships between child externalising and parenting, especially for effective management, which was associated with child externalising at all three time points examined, whilst for warmth there was a concurrent relationship only at age 2. Findings are similar to those found in the study by Yates et al. (2010) that also examined reciprocity between child externalising and positive parenting, which was a composite measure of parental support and assistance, assessed at child age 2, 3.5 and 6. This study showed few longitudinal effects, but concurrently the associations between parenting and child externalising were quite substantial. Because these

relationships are concurrent, caution has to be taken with making causal claims. Results could reflect parenting effects, child effects, or both by reflecting 'in the moment' reciprocal association between parenting and child behaviour. Although, studies that have examined concurrent reciprocal associations between child conduct problems and parenting in cross-lagged autoregressive models have suggested that concurrent relationship are driven largely by child effects (Fite et al., 2006; Verhoeven et al., 2010).

For child internalising problems, the evidence for longitudinal reciprocal effects was stronger. Higher level of effective management at age 2 predicted lower child internalising at age 3, and higher child internalising at age 2 predicted lower effective management at age 3. Bidirectional effects between child internalising and parental warmth were seen later, with higher warmth at age 3 predicting lower internalising symptoms at age 5, and higher levels of internalising at age 3 predicting lower parental warmth at age 5. For both of these bidirectional results, parenting effects were stronger than child effects. Not many studies have examined bidirectionality between child internalising problems and parenting behaviours, however findings in the current study seem consistent with the ones that exist, as both Hipwell et al. (2008) and Serbin et al. (2015) found larger parenting effects than child effects. The investigation by Barbot et al. (2014) reported parent and child effects that were equal in magnitude in their two wave study, although the parenting variable that predicted child internalising was parental rejection whilst internalising predicted parental stress, which is not strictly parenting behaviour but better perceived as a contextual measure. Findings from the current study are therefore largely consistent with these previous studies by showing that parenting is the most dominant factor in the dynamic parent-child relationship in terms of the development of child internalising problems.

The current study also showed evidence of a concurrent relationship between warmth and child internalising at age 5, with higher child internalising problems being associated

with higher parental warmth. It is possible that this association constitutes a child effect, whereby a child that shows anxious or depressive symptoms evoke parental warmth (Serbin et al., 2015). Or it might be the case, as suggested by Rubin et al., (1997), that parents who are very warm, but also very overinvolved or overprotective of their child, may deprive it of independence and hamper the development of the child's self-confidence. This might be especially applicable at the age of 5 when children may seek increasing self-determination and independence from their parents, whereas earlier in development higher levels of support from the parent would still be needed (Erikson, 1950), and this might explain why this counterintuitive relationship between parental warmth and child internalising was not seen for age 2 and 3.

Although children may play an active role in their rearing environment, because of the very nature of the parent-child relationship and the imbalance of power characterising this, parents may be considered the main driver of this interactive relationship. More importantly, parents have the capacity to consciously change and modify their parenting practices with the view to influence child functioning, which is the objective in most parent interventions, whereas child-led initiatives of this sort cannot be expected.

6.9. Implications for parenting interventions

Findings from longitudinal developmental studies are useful for identifying facets of parenting that constitute protective factors for children's adjustment, such as the development of conduct and emotional problems. It is important to highlight that in these studies, including the current one, care has to be taken with regards to making causal claims because longitudinal association does not equate to causation. Even if we were confident about causation we have to be mindful of the possibility of the *treatment-aetiology fallacy* (Cowan, 1988), that what causes a given condition does not necessarily play a role in

successful intervention. Nevertheless, risk and protective factors are still important for the development of treatment and intervention and even more so for prevention. Therefore, findings from this study warrant discussion on several points in terms of their implications for intervention that aim to influence child functioning by targeting parenting practices.

6.9.1. Short-term versus long-term effects

Most parenting programmes incorporate the teaching of positive parenting skills with a view to facilitating changes in child functioning. However, as demonstrated in this study, some aspects of positive parenting may only have short-term effects, whilst longer-term effects may vanish or even be detrimental to child functioning. On the other hand, some parenting practices may have more enduring effects, or effects may be delayed by having a stronger associated with child adjustment over time. Many programmes developed for preventing or reducing child conduct problems emphasise practices such as praise and reward, limit setting, time out and ignoring. These are positive parenting practices associated with social learning theory, which focus on control and behavioural management of children. These kinds of programme are often referred to generically as *parent management training* (PMT). As suggested in the current study, which examined parental effective management, these practices may have beneficial effects more immediately and in the short-term, but not necessarily in the long-term.

Most evaluations of parenting interventions tend to also be short-term. The standard design in most randomised controlled trials is a post intervention assessment within a couple of months of the end of treatment, and then a follow-up at one year, and only a minority of evaluations follow-up beyond this time-frame using a control group. In a Cochrane review of group-based behavioural and cognitive behavioural parenting programmes for early onset conduct problems, none of the 12 included studies had follow-ups beyond 3 months (Furlong

et al., 2012). Publications of single controlled trials of parenting interventions that have used the term ‘long-term’ in their title include that by Brotman et al. (2008) of an intervention with high risk preschoolers who were followed up at 24 months post-intervention, and the trial by Bywater and colleagues (2009) that followed-up children at risk for developing conduct problems after 18 months. So from a child developmental perspective, trials defined as ‘long-term’ are rather short-term.

In a systematic review by Sandler et al. (2011) of ‘long-term’ impact of parenting programmes, the criteria for inclusion was a minimum of 1 year follow-up. Although this review reported intervention effects of up to 20 years, this was in relation to the programme Nurse Family Partnership (Olds et al., 1998) that involved nurses visiting first-time mothers at home during pregnancy and during the child’s first two years, with programme components consisting of parent education on child development, as well as support for improving the life course of the mother, such as education and employment. Generally the programmes that reported the longest effects on child behavioural outcomes were more intensive programmes that were implemented over several years, and/or that were bimodal or multimodal by including additional components such as a child programme or an academic/school module (Bernat et al., 2007; McCord et al., 1994; Tolan et al., 2004; Tremblay et al., 1995). This is consistent with the review by Yoshikawa (1995) that used an inclusion criteria of 5 years follow-up of long-term effects of early childhood programmes on social outcomes and delinquency. Programmes identified in this review as having long-term effects were: 1) targeted at high risk populations, 2) intensive (2 years or more), 3), involved home visits (often weekly), 4) bimodal or multimodal (parenting programme, parent wellbeing and circumstances, child programme, child early education/preschool). In terms of the PMT programmes included in the Sandler (2011) review, the follow-up period tended to be much shorter, with the majority of intervention studies reporting effects on child

conduct problems at 1-year follow-up. One evaluation of the Triple P intervention had a 3 year follow-up, but this had lost the control group because of the wait list study design (Sanders et al., 2000). One PMT programme that showed long-term effect was the Oregon Divorce Study (Forgatch et al., 2009) that recruited divorcing mothers with sons in grade 1-3. Followed up after 9 years, boys in the intervention groups were reported to have lower teacher reported delinquency and police arrests. This intervention was based on the Oregon PMT programme that involved: skills encouragement, limit setting, monitoring, problem solving, and positive enforcement. However, to further meet the need of divorcing families some additional programme components were added: communicating with children, observing emotions, managing emotions, problems solving (interpersonal problems), managing conflict (e.g. with spouse or co-workers), and balancing work and play. This intervention therefore integrated a significant amount of components that concerned emotional and parent-child relational aspects, and these might have carried some of the long-term effects.

In a recent meta-analysis of randomised controlled trials of parenting programmes for disruptive child behaviour, which examined to what extent there were sustained, fade-out, or sleeper effects on child outcomes beyond the intervention, the majority (58%) of the 40 included studies had follow-ups of 12 months or less, and only 7% of studies had a follow-up period of 18-36 months (Van Aar, et al., under review). One of the inclusion criteria in this meta-analysis was that the control group was available for comparison at follow-up.

The short follow-up period seen in most evaluations of parenting interventions falls within the period when social learning parenting skills have positive effects on child outcomes, as in the current study. This is consistent with many of the well conducted randomised controlled trials of social learning interventions that have demonstrated effectiveness in short-term evaluations (Dretzke et al., 2009; Furlong et al., 2012; Sandler et

al., 2011; Stewart-Brown and Schrader-McMillan, 2011). Although as discussed above, and also highlighted by many authors of systematic review of parenting interventions (Dretzke et al., 2009; Furlong et al., 2012; Stewart-Brown and Schrader-McMillan, 2011), very little is known about the long-term effects of these programmes for preventing or reducing child problems, and there is an urgent need for research that examines the long-term potential of these programmes.

Implicitly it is the goal of all parenting interventions to improve child outcomes long-term by impacting difficulties not only in childhood but also outcomes in adulthood, which have been found to be preceded by problems in childhood. The expectation of long-term impact has been the underlying rationale for governments around the world to invest in parenting interventions on the large scale that has been seen in the last decade. In the UK this has been in the form of initiatives such as Parenting Early Intervention Programme (PEIP), and the National Academy for Parenting Practitioners (NAPP), which have disseminated 'evidence-based' interventions nationally. However, as outlined above, it is on the basis of relatively short-term evaluations that these programmes have gained their status as 'evidence-based' and been included on governmental lists of programmes recognised to 'work'. It is concerning that the long-term evidence-base for these programmes is largely absent. It therefore seems a priority to assess what works in the long run in terms of parenting interventions that reduce children's behavioural and emotional problems, and continue to impact outcomes in middle childhood, adolescence, and adulthood. Findings from the current study cast doubt on the existence of long-term effects of programmes that focus predominately on social learning aspects of parenting, although only long-term evaluation of these programmes would be able to provide a more definitive answer to this pending question.

There are a number of apparent barriers to long-term evaluation of interventions being common practice. Funding of trials is a significant one, as running a well-conducted controlled study is an expensive enterprise. Another obstacle to longitudinal evaluation is the use of a waitlist controlled design, an approach that is often justified on ethical grounds, although one could equally argue that it is unethical to not test long-term effectiveness. Effects may decay with time and thereby waste valuable resources, or there may even be iatrogenic effects that are unravelled with time and causing harm to intervention participants, as demonstrated in some evaluation studies (McCord, 2003). Another impediment to long-term evaluation of programmes is that there might be commercial risks associated with more stringent tests of effectiveness, especially for interventions that have gained status as 'evidence-based', such as the well-established branded interventions that are wide1y disseminated. In a recent randomised controlled trial with four years follow-up of the Triple P parenting intervention, it was found that effects on parenting were stable across this period, but effects on child behaviour were not maintained four years after the intervention (Heinrichs et al., 2014). It would be important to know how many other well-known parenting interventions would pass the test of long-term evaluation. An additional factor that might contribute to the lack of long-sightedness in intervention research is that recognised standards of evidence, such as those developed by the Society of Prevention Research, do not include a requirement for truly long-term evaluation. In the first set of standards, a follow-up at 6 months beyond the end of the intervention was recommended as appropriate (Flay et al., 2005). In the recent updated version (Gottfredson et al., 2015), the 6 months interval still applies, although it is recommended that a more appropriate time interval for follow-up should be based on the theory of timing of effects of the intervention.

6.9.2. Potential of attachment focused interventions

As discussed above, the current study supports the perspective of enduring effects of early childhood experiences (Fraley & Roberts, 2005; Sroufe et al., 1979, 1990). This was in

relation to the attachment aspect of parenting (warmth), which showed not only enduring effects but indicated that there were possible sleeper effects (Kagan & Moss, 1962). On the other hand, parenting associated with social learning parenting (effective management), whilst showing short-term association with less child problems, in the longer-term was not predictive of child conduct and emotional problems. These findings highlight that not all early parental experiences are enduring but some may fade relatively quickly. This has implications for parenting interventions, which aim to have lasting effects on child functioning.

Findings from this study highlight the need for offering early interventions that teach attachment aspects of parenting for children who manifest behavioural and emotional problems or who are at risk of developing these. Early warmth also interacted with concurrent effects of effective management, meaning that early warmth was a precondition for later effective management parenting practices to be effective.

The present study examined 'warmth', a somewhat narrow aspect of parenting conceptualised from an attachment theory perspective. As identified by De Wolff & Van Ijzendoorn (1997) in their meta-analysis of parental antecedents of child attachment, many other parenting behaviours have been demonstrated to be associated with child attachment; these include sensitivity, contiguity of response, physical contact, cooperation, synchrony, mutuality, emotional support, positive attitude, and stimulation. Interventions that include a number of these facets, what perhaps can be defined as an attachment parenting style, may be successful in impacting child conduct and emotional functioning.

A number of attachment oriented interventions exist, and a meta-analysis of randomised controlled trials found these interventions to be effective for increasing parental sensitivity (d=.33) and child attachment (d=.20) (Bakermans-Kranenburg et al., 2003). Programmes that had the largest effect sizes for sensitivity also enhanced child attachment

the most, indicating that the relationship between the two may be causal. In addition, authors of this meta-analysis propose that there may be sleeper effects of interventions on child attachment because of an expected time lag between change in parental sensitivity and change in child attachment. Any such effects will have been missed because attachment interventions also suffer from the methodological limitation of short-term follow-up that plague the rest of the intervention field, as highlighted above. Findings from the current study support the suggestion of sleeper effects in relation to parenting based on attachment theory.

The meta-analyses by Bakermans-Kranenburg et al. (2003, 2005) also highlighted that the interventions that have been shown to be the most effective in term of enhancing parental sensitivity and child attachment, were interventions that focus on parenting behaviour and skills. Whereas those approaches that aimed to support parents and that targeted parent's own attachment representations, for example through psychotherapy, showed no effects on parental sensitivity or child attachment. This suggests that a 'doing' rather than a 'talking' approach to attachment intervention for parents is the most promising. Of course we do not know how these two different approaches compare in the long run because of the lack of long-term evaluation. It maybe that therapy-based interventions are effective in the longer term, because they target parents' own attachment representations, resulting in parents achieving 'earned security' by resolve their insecure childhood experiences and forming secure inner working models (Main et al., 1985), which in turn will influence their interactions and relationship with their own children. Although this may be a viable route for improving child functioning, it seems that that it requires sustained and long-term intervention before any effects on children can be expected.

In most evaluations of attachment-based interventions the focus has been on changing parent sensitivity or similar attachment related parenting, and on child attachment

status, although some evaluation studies have also assessed impact of child behavioural functioning. Van Zeijl et al. (2006) tested the intervention 'Video-feedback Intervention to promote Positive Parenting and Sensitive Discipline' (VIPP-SD), using a randomised controlled study design with a sample (N=237) of 1-3 year olds with elevated externalising scores. At one year follow-up there was an improvement in children's overactive behaviour problems (although only for families with more marital discord and in families with more daily hassles), but there was no intervention effect on oppositional or aggressive behaviours. In an randomised controlled trial of the attachment oriented programme 'Child-Parent Psychotherapy' (CCP), with a sample (N=75) of 3-5 year olds with clinically concerning behavioural problems, results showed that there was a reduction in CBCL total problems at 6-months follow-up (Lieberman et al., 2006). In another randomised controlled trial of a brief 8-week attachment intervention, with a small sample (N=67) of maltreated children aged 1-5, improvements were found in CBCL internalising and externalising assessed immediately after the treatment, although these effects only applied to older children in the sample (Moss et al., 2011). This trial also reported effects on parental sensitivity and on child attachment that were not moderated by age, which suggests that older children may be especially receptive to changes in attachment parenting and that sleeper effects may be less applicable to older children. It is conceivable that parental attachment behaviours are processed more quickly into children's internal working models as children get older because of advances in cognitive skills. Results of this latter trial are interesting because attachment based approaches are usually targeted at infants and very young children due to the fact that attachment is highly associated with infancy in child developmental models (Erikson, 1950). The suggestion that attachment approaches are especially effective for children beyond infancy is also supported by findings in the meta-analysis of effects of attachment-based interventions referred to previously (Bakermans-Kranenburg et al., 2003).

This found that attachment interventions that started when children were 6 months or older were more effective than those starting when children were under 6 months. It is important to note that this meta-analysis did not examine child behavioural outcomes, but focused on parent sensitivity and child attachment status. However, as suggested in the current study, parenting that draws on attachment theory seems to have durable and even sleeper effects on child functioning, and therefore interventions that induce these aspects of parenting may be promising for preventing and reducing child conduct and emotional problems long-term. Although it would be necessary to formally evaluate attachment interventions in terms of their capacity to change not only attachment-related parenting and child security status, but also children's behavioural outcomes. Because attachment related parenting may be prone to having sleeper effects on child functioning, a randomised controlled trial design with long-term follow-up would be needed in order to examine the effectiveness of attachment-focused interventions. As with most other parenting interventions, attachment oriented programmes tend to have been evaluated only short-term and it would be important to evidence their effectiveness before making any firm recommendation of using these programmes for prevention and intervention for child conduct and emotional problems.

6.9.3. Usefulness of short-term intervention effects

Although it is important to ensure long-term effects of parenting interventions as discussed above, it might be sensible to also aim to induce immediate effects, even if short lived. This is because of the possibility of bidirectional effects (Bell, 1968; Belsky, 1984; Sameroff, 1975) whereby a change in child behaviour can influence parent behaviour and wellbeing, which in turn predicts child outcomes. Interventions directly targeted at children, and not involving any parenting component, have been found to be effective for reducing child problems, but they have also demonstrated an effect on parenting practices (Scott, 2008),

presumably as a response from parents to improvements in their child's behaviour. Children's externalising behaviours have been found to predict parent depression (Gross et al., 2008), which in turn is a significant predictor of child functioning as shown in numerous studies (Downey & Coyne, 1990). In the current study, parent depression was included as a control variable, and this was found to be predictive of child externalising and internalising over and above parenting and other covariates. In an RCT of ' Management Training' (PMT) a chain of mediation over time was found, whereby a change in parenting practice led to change in child behaviour, and in turn this reduced maternal depression (DeGarmo et al., 2004). Therefore, parenting interventions that include programme components that have immediate effects may create a platform for other changes that more directly impact child functioning. It is also conceivable that short-term effects may keep parents more motivated and engaged with programmes because they see positive changes in their children.

6.9.4. Social learning interventions drawing on attachment theory

Many of the parenting interventions that have been recognised as evidence-based by government agencies and other reputable organisations (e.g. UK Department of Education, US government's SAMHSA NREPP, and Blueprints for Violence Prevention), focus on parental child management techniques and define themselves as being based on social learning theory. However, in reality many of these programmes contain components that are related to attachment aspects of the parent-child relationship. This was discussed previously in Chapter 2, where parent intervention was provided as an example of the integration of social learning and attachment theories. It may therefore be the case that these 'hybrid' programmes have multiple mechanisms of change that have different timings in terms of their impact on child functioning, as suggested in the current study findings. Short-term effects of parenting intervention, which have been evidenced in many trials as discussed

above, may be due social learning content such as discipline and control. On the other hand, long-term effects of intervention on child functioning may be induced by attachment related parenting, although truly long-term effects are very rarely studied in the context of parent intervention as discussed above. In addition, there may be interactions between early and later parenting that affect child functioning. This is supported by findings in the current study that showed that parents who at an early stage build a warm relationship with their children, and who later effectively manage their children, may enhance their children's functioning.

6.9.5. Use of theory in intervention development

Another point for discussion in relation to the current study's implications for intervention is the use of theory in intervention development. We know from empirical research that programmes that draw on theory are more effective than programmes without a theoretical framework (Nation et al., 2003). The focus of the current study was on theoretical aspects of parenting, and findings are suggestive that it might be useful to extend the integration of theory into the design of parenting interventions for planning aspects such as the timing of effects. As a function of their underlying theory, some programme components may produce short-term and others longer-term effects. Theory might also be utilised to think through which aspects of parenting would be expected to interact to further enhance positive effects on child adjustment. It would be important that evaluations of interventions include appropriate measures of hypothesised parenting mediators, in order to confirm that they are in fact the mechanisms that lead to change in child functioning not just at a theoretical level but also in an applied context of parenting intervention. In a recent review by Forehand et al. (2014) of behavioural management training, 35 studies were identified as having tested parenting as a mediator of child externalising outcomes. It was found that parenting

mediated 45% of the tests of mediation across these studies, although this still leaves the majority of effects unaccounted for. This review also flagged that many evaluations of these interventions do not test parenting as a mediator. It is important for parent intervention, as it for all other psychosocial intervention, to properly understand how effects are achieved. Understanding the active ingredients and operational mechanisms in interventions is useful for the development of briefer and therefore less cost-intensive interventions (Leijten et al., 2015). As suggested by Sandler et al. (2011), there may be different mediational models for how long-term effects in children's behavioural outcomes are achieved.

6.10. Methodological considerations

Results also warrant some discussion in terms of possible effects of the methods used in this study.

6.10.1. Parenting measures

Different methods and instruments were used for measuring the two theoretical parenting dimensions. Four items from the HOME (Bradley & Caldwell, 1979; Bradley et al., 2001) measured parental warmth, which was reported by the home visitor immediately after the visit. Four items from the COIMP (Dishion et al., 2004) measured parental effective management, which was reported by the person coding the video of parent child interaction tasks. The reason for using different instruments, rather than using items from across both observational instruments for both parenting measures, was because of a high correlation between constructs when including items across instruments. Too much overlap between constructs would make it difficult to explore predictive differences between these theoretical aspects of parenting. However, the use of different methods and instruments for measuring observed warmth and effective management may also be problematic, as any differences in

their prediction of child outcomes could be attributed to the methods rather than the theoretical underpinning of parenting. For example, the home visitor, who assessed parental warmth using the HOME, may have been able to form a better global impression of families through the time spent with the family administering the questionnaires, administering and witnessing the interaction tasks, and also collecting other data such as the five minute speech sample where the parent talks about the child. In contrast, the COIMP used for measuring effective management was reported by the coder of the video recorded interaction tasks (around 55 minutes in total), who had no direct contact or involvement with the family, and therefore their impressions of the family may be based on more limited information. The COIMP rater could be said to be more 'blind' to any additional information and impressions about the family, whereas the HOME rater would have much more information to draw on and may even have seen the parent's responses to the CBCL. However, if it was the case that warmth is a more valid measure of parenting, one would expect to see this measure as a stronger predictor of not just later child outcomes but also of early outcomes. In the current study, early child functioning at age 3 and 4 were found to be predicted best by effective management whereas warmth had little association with children's early functioning.

6.10.2. Conservative estimates

The associations between parenting and child functioning found in this study were small to modest. However, these associations were over and above previous child behaviour assessed at age 2, which was included as a control variable in all analysis. This was an attempt to take account of child factors influencing child conduct and emotional functioning, as heritability has been shown to account for a large proportion of child behavioural outcomes (Bergen et al., 2007). Although, it is important to highlight that child behaviour at age 2 will in part be due to earlier environmental parenting influences, and therefore cannot be regarded as a

purely heritable measure. Controlling for previous problem behaviour that is partly predicted by the children's earlier parenting experiences means that the associations between parenting and child functioning found in this study are conservative estimates.

It is also worth noting that the parenting constructs examined in this study, 'warmth' and 'effective management', are each made up of only four indicators. These measures therefore represent relatively discrete aspects of parenting associated with attachment theory and social learning theory, respectively, and these constructs cannot be defined as parenting styles. In their review and meta-analysis of associations between parenting and child externalising behaviour, Rothbaum & Weisz (1994) found larger associations for parenting styles involving multiple variables than for discrete parenting behaviours. The relatively small and modest associations between parenting and child adjustment found in this study might therefore be expected. Multidimensional constructs of attachment based and social learning related parenting would be anticipated to be stronger predictors of child functioning.

6.11. Methodological strengths

6.11.1. Observed parenting

In terms of methodological strengths, this study used measures of parenting behaviours that were directly observed in the family home during a variety of structured parent-child interactions, and in the case of the HOME other observations and impressions of the family observed during the home visit were also drawn upon. As highlighted by Aspland and Gardner (2003) and Gardner (2000), there are a number of advantage of using observational methods over parents' own reports of their parenting practices. First, parents' individual biases and perceptions, such as their expectations, their attributions about the child, and parent depression, may influence how they report their own behaviours. Therefore, parent

reports lack uniform standards and criteria, and parents with similar behaviours may report these very differently depending on their individual vantage point. Especially in the context of an intervention, there may be high expectations for change and parents may over-report changes. The observer on the other hand is a more reliable instrument as observed behaviours are coded by defined standards and criteria, and often studies perform checks on inter-observer reliability. In the current study, these checks were done for the COIMP that measured 'effective management', but not for the HOME that measured 'warmth'. Second, observational measures tend to be more sensitive and better able to detect real changes in behaviour, because observations can capture nuanced aspects of behaviour that can be difficult to operationalise in questionnaire format. It is however important to note that observations have their limitations too, which will be discussed in further detail in the limitations section.

In this study, which used parent reports of child behavioural and emotional outcomes, it was especially important to use observations of parenting rather than relying on parent reports. This is because of the risk of 'method bias', which refers to the inflation of the association between two variables as a result of measures originating from the same reporters (Podsakoff et al., 2003). If parenting practices and child outcomes were both reported by parents, this would lead to a shared variance between these variables that to some degree is a reflection of data originating from the same reporters, with their individual biases influencing both measures, rather than a representation of the real relationship between parenting and child problems. Such method overlap would tend to mean that questionnaire measures of parenting are more predictive of child outcomes. However, an advantage of observed parenting is that it may represent a more valid measure of parenting, and therefore be a better predictor of child outcomes. Evidence of better predictive validity of observed parenting, compared to parent reports, has been shown in meta-analyses of

studies reporting the association between parenting and child externalising (Rothbaum & Weisz, 1994) and anxiety (McLeod et al., 2007a). Although, a similar meta-analysis of child depression showed larger associations with parenting that was assessed via questionnaires (McLeod et al., 2007b).

6.11.2. Longitudinal design

Another methodological advantage of this study is the longitudinal design, with early assessments and mostly yearly follow-ups though key child developmental stages. This allowed for examination of the relationship between parenting and child problems on a longitudinal basis. The age band of the children was narrow, and therefore examinations could be carried out that provided more precise information about the timing of parenting and the relationship to child outcomes at a specific age. Because this study followed children through their transition to school, there was the opportunity to assess children's functioning outside their primary environment, where any influence of this environment is more likely to be demonstrated as proposed by Bronfenbrenner (1979).

This longitudinal design also enabled controlling for the effect of previous child behavioural and emotional problems, which is one of the strongest predictors of future problems. Taking into account pre-existing child problems provides more robust and compelling evidence for any effect of parenting. Children's earlier problems may of course be affected by parenting practices prior to assessments in this study, and there may also be earlier bi-directional effects at play, which this study was unable to examine.

6.12. Limitations of study

Despite the many strengths of this study, it is important to also thoroughly discuss some of the methodological limitations. These have implications for the validity of findings and the

conclusions that can be drawn. Outlining these drawbacks is also helpful for informing further research with improved methodological approaches.

6.12.1. Parenting measures

The overarching aim of this study was to compare attachment theory and social learning theory in terms of parenting practices associated with these conceptual frameworks and their prediction of child functioning. The most notable limitation of this study relates to the measures of parenting, 'warmth' and 'effective management', and the extent to which they can be said to fully characterise parenting associated with attachment theory and social learning theory, respectively. As outlined in Chapter two of this thesis, these two grand theories are complex with many facets and nuances in terms of how parenting comes to influence child behaviour. The measures used in this study only represent limited aspects on parenting behaviours that embody these two respective conceptual frameworks. Many of the contextual and contingent aspects that are part of the underlying mechanisms for how parenting is proposed to influence child behaviours are not captured in the current measures.

In attachment theory, the main emphasis is on the parent responding to the child's needs and being available in a time of distress by providing a secure base to which the child can return. This secure base aspect is especially relevant at the age of 2-3 at the stage of the 'goal-corrected partnership' (Bowlby, 1969), when children's separation anxiety subsides and their feeling of security is less concerned with proximity but shifts to the availability of the parent in a time of need. This secure base aspect and parent response to child distress was not captured in the attachment-related parenting measure used in the current study. In future studies that measure parenting behaviours associated with attachment, parent behaviour should ideally be coded according to their response to their child's need for a secure base. A related to problem is the fact that it is not known to what degree the measure of parental

'warmth' corresponds to the child feeling of security, because attachment security was not assessed in the original study on which the current analyses are based. In terms of developing a measure that better encompasses multiple aspects of attachment related parenting, the systematic review by De Wolff & Van Ijzendoorn (1997) may be of utility. This identified a range of parenting behaviours that correlated with child security: sensitivity, contiguity of response, physical contact, cooperation, synchrony, mutuality, emotional support, positive attitude, and stimulation. Collectively, these parenting aspects may constitute what one may define as an attachment parenting style, which is likely to have better predictive validity of child functioning than discrete parenting behaviours (Rothbaum & Weisz, 1994).

In the social learning theoretical approach to parenting, the focus is on the parent responding to the child's behaviour by encouraging desirable behaviours (positive reinforcement) and limiting and sanctioning undesirable ones (negative reinforcement). The concept of coercive cycles of parent-child interactions is central to the dominant social learning model, 'coercion theory', which proposes that child antisocial behaviours are negatively reinforced by harsh and inconsistent parenting, involving the parent capitulating after an escalation of parent and child conflict (Patterson, 1982). On the other end of the parenting spectrum is positive parenting, such as praise, reward and encouragement of child's displays of good behaviours (Gardner, 1987), which is suggested to positively reinforce such child behaviours. In the measure of social learning related parenting in the current study these contingent aspects of parenting are not adequately captured. In order to properly test social learning it would be necessary to measure parent positive attention as a response to child positive behaviours, whilst measuring negative aspects of parenting would involve capturing harsh parenting behaviours that end with the parent giving in to the child after an episode of coercive parent-child interactions. As highlighted previously, few studies

have measured these negative reinforcement processes successfully (Gardner, 1989; Snyder et al., 2016).

Other limitations of the social learning parenting construct used here is that it does not include the concept of monitoring the child activities and behaviours, which is also central to coercion theory. As explained previously, an item related to monitoring was removed from 'effective management' because it cross-loaded with the attachment related measure 'warmth'. This may be because this item related to monitoring not just of child's activities but also child's feelings, and it therefore tap into aspects of attachment theory. Another dimension of parental influence through social learning processes that has not been fully captured in the current study is modelling. The measure of 'effective management' contains one item regarding parent use of directives that are specific and clear, which might qualify as what Bandura (1969) called 'verbal modelling'. However, other important aspects of modelling such as the child observing and modelling parent behaviour are not included.

The problems with the measurement of parenting constructs do not only relate to the substantial or theoretical content of these measures but also the way that parenting dimensions are measured. Each theoretical parenting measure is represented by only four items, so measures are very brief. Moreover, each parenting construct was measured using just one instrument – warmth used the HOME (Bradley et al., 2001), and effective management used the COIMP (Dishion et al., 2004). The use of single method measures leaves the constructs vulnerable to bias, as their relationship to other variables such as child outcomes could be due to effect of method rather than the substance of the measure. As discussed above, because warmth was assessed by the home visitor it may represent a more global and valid assessment of parenting, due to the greater availability of additional information from which the home visitor could draw on in forming their global impressions of parents. In contrast, the video coder, which reported on parents' use of effective

management, was limited to forming their global impressions based on only the parent-child interaction tasks, which are much more limited and provide no other context of the life and atmosphere in the family. However, the finding that warmth increased its association with child outcomes over time is difficult to explain in terms of method effect, as discussed above. Nevertheless, there may be additional qualities in the home environment that were detected by the home visitor and that may contribute of the longitudinal effects on child functioning.

Another limitation that relates to the measurement of parenting is the extent to which observers may be assessing actual parenting behaviours. As discussed previously, it is generally considered an advantage to use observed measures of parenting, rather than relying on parent reports. However, it is important to keep in mind that observers may also have their own systematic biases which could influence results. Often, observational studies assess inter-observer reliability to examine the agreement between observers. Although these checks were carried out for the COIMP that measured 'effective management', no such reliability test was done in relation to the HOME that measured 'warmth', as only one home visitor was available for completing this observational measure. However, even when inter-observer reliability checks are carried out and these show consistency between raters, this does not necessarily mean that a measure is more objective. Rater agreement may to some extent indicate agreement in judgement of the parent based on raters' shared impressions and cultural values, rather than parenting behaviours per se. So even if an observed measure of parenting is relatively reliable between observers, it may not necessarily be a valid measure of parenting.

Ideally this study would have used measures of parenting drawn from multiple methods and informants (McMahon & Metzler, 1998). So in addition to observations, these are methods such as face to face interviews with parents; parent-reported questionnaires

scales; vignettes soliciting what parent do or would do in a given situation; or speech samples for assessing parent affective attitude towards child. Furthermore, this study used observed global measures of parenting, but it would have been useful to also draw on micro-coding of parent-child interactions tapping the many nuances and dimensions of the two theoretical frameworks of parenting. As noted previously, it was not possible to incorporate the micro-social coding data available in the dataset, because it did not allow for separating out attachment- from social learning related aspects of parenting. Another potentially valuable source of assessment of parenting is administrative data, such as social services records, which could provide information about things such as child abuse or neglect. In terms of informants, it would have been advantageous to have used not just researcher observers, but also parents themselves and others such as spouses and partners, and family social worker where applicable. In this study it would not have been appropriate to use children as informants for assessment of parenting at toddler age, but it may have been possible when children were age 5.

In summary, the measures ‘warmth’ and ‘effective management’ used in this study represent only limited aspects of parenting associated with the two grand theories of attachment or social learning, and their measurement can be said to be somewhat methodologically weak . Therefore, it would be necessary to address these methodological limitations related to the measurement of parenting in further research before drawing any firm conclusions with regards to comparisons between parenting related to attachment theory and parenting conceptualised from social learning theory.

6.12.2. Parent reported child problems

Another study limitation is that child behavioural and emotional problems were measured only through parent questionnaire reports. Parent reports of child behaviour can be biased

and influenced by parents' perceptions of their child and by parents' personal circumstances and characteristics. Parental depression in particular has been shown to be associated with over reporting of problem behaviour in children (Najman et al., 2000). Using multi-informants for the assessment of child conduct and emotional problems would constitute a more valid assessment of these problems (Campbell & Fiske, 1959).

A related issue is the study's reliance on questionnaire reports of child problems rather than observed child behaviour. There is evidence to suggest that direct observation of child behaviour is more valid than questionnaires, for reasons of reporter bias as mentioned above. In a sample of 5 to 12 year olds, Patterson and Forgatch (1995) found that home observations of child aversive behaviour predicted police arrest and out-of-home placement 2 years later, whereas neither parent nor teacher reports of CBCL externalising behaviour predicted these outcomes. Long-term predictability of observed child behaviour was also shown in the well-known Dunedin study, which found associations between observed externalising and internalising behaviour at child age 3 and adult psychiatric disorders at age 21 (Caspi et al., 1996).

6.12.3. Confounding factors

Although this study controls for a number of factors other than parenting that may be related to child functioning, there are some relevant confounding factors that may have been omitted. Because this study is not genetically informed, it is not possible to control for heritable factors that might explain some of the effects of parenting. A second best option is to use proximal measures; for example parent depression was controlled for and showed an association with both child internalising and externalising problems at every assessment time point, over and above parenting, and it also showed an association with early parental warmth but not with effective management. A further variable that would have been

important to also control for is parent antisocial behaviour, as this could be a proxy for heritable factors for externalising behaviour. Unfortunately this variable was not available in the dataset.

Other important environmental influences on child emotional and behavioural functioning are child abuse (Paolucci et al., 2001), and children's experiences of domestic violence (Kitzmann et al., 2003). The continuity of child problems over time, as seen in this study and in previous studies, may be due in part to children being exposed to the same family risk factors over time, some of which may be associated directly with child functioning and others mediated through parenting practices.

6.12.4. Study sample and generalisability

Another limitation of this study is related to the characteristics of the study sample, which was drawn from a population at high risk of early development of conduct problems because of child, family or socioeconomic risks. It is uncertain whether these results will replicate in populations with less risk. However, because children at high risk tend to be the very population that many parenting interventions aim to target, knowledge of the parenting aspects that can reduce child problems in this population is especially important. There is some indication from previous studies (Speltz et al., 1995; Tein et al., 2004; Zhou et al., 2008) that parental attachment aspects, compared to social learning dimensions, are related to child problem behaviours especially in high-risk groups. In previous examinations of the current sample, children's callous-unemotional (CU) behaviour was tested as a moderator of the relationship between parenting (harshness and warmth) and child conduct problems (Waller et al., 2015). Results showed that concurrently at age 3, parental warmth was more strongly associated with lower levels of conduct problems in children high in callous-

unemotional behaviour, whereas harshness had uniform association with child conduct problems in high and low CU children.

When identifying optimal parenting behaviours as in this study, or even parenting style as proposed by Baumrind (1966, 1967), there is an assumption that one size fits all. In reality children may differ in their sensitivity to parenting experiences based on their individual characteristics and temperament. Gender for example, may be a moderating factor. That boys and girls may be differently influenced by parental behaviour was shown in one of the early studies that observed parent-child interaction and examined their longitudinal association to child functioning (Martin, 1981). It was found that mother responsiveness at age 10 months predicted boys' compliance at 21 months, and coerciveness at age 42 months, but this predictive effect was not found for girls. Maternal responsiveness (age 10 months) had directly opposite effect for boys' and girls' exploration out of sight of their mother (at age 22 months) and for their interest in social interaction with strangers (at age 42 months). For boys, maternal responsiveness encouraged these behaviours but for girls it attenuated their exploration and social interactions. Therefore this early study is suggestive that boys may be more positively influenced by attachment related parenting than girls.

Furthermore, emerging research literature from the field of behavioural genetics has demonstrated that there are gene-environment interactions, whereby children are affected differently by similar rearing experiences as a function of their genotype (Pluess & Belsky, 2010). Therefore, it is possible that children may differ in their response to the parenting behaviours examined in this study depending on their genetic predisposition.

6.13. Further research

6.13.1. Further analysis in the current sample

It would be relevant to further explore questions related to warmth and effective management and child outcomes in the current sample. These are research questions that have not been included in this thesis due to limitations of space, but it would be important to address these in further examinations.

For example, aspects of parenting may have different associations with specific types of behaviour that are often banded together in broader behavioural measures such as externalising and internalising. Meta-analyses have indicated that parental warmth may be more strongly associated with child depression (r=.28; McLeod et al., 2007b) than with child anxiety (r=.06, McLeod et al., 2007a). Therefore, in the current sample, analyses should be extended to examining more refined aspects of externalising and internalising such as subscales of these CBCL broadband measures (anxious/depressed; depressed; somatic complaints; social problems; thought problems; attention problems; rule-breaking behaviour; aggressive behaviour), and to the DSM-oriented measures (affective, anxiety, somatic, attention-deficit/hyperactivity, oppositional, and conduct disorders), which were developed more recently (Achenbach et al., 2003). Comorbidity of child externalising and internalising problems is another outcome that would be interesting and relevant to examine in term of how the two theoretical dimensions of parenting compare as predictors. Other child outcomes assessed in the sample could also be tested in terms of their association with the two theoretical dimensions of parenting. These include alternative measures of behavioural problems, but also positive outcomes such as social skills, peer relationships and cognitive skills, which in intervention research tend to be focused on less than behavioural problems. Results of such further analyses could provide useful knowledge of which aspects of

parenting are especially strongly related to children's more specific problems. Such insight could benefit programme development, and also assist in matching existing social learning or attachment programmes more appropriately to children according to what works best for their specific problems and needs.

Another aspect for future examination in the current sample is moderation analysis of the relationship between parenting and child functioning. As discussed previously, children might differ in terms of their sensitivity to parenting and respond differently to parenting behaviours. As indicated in the existing literature, outlined in Chapter 2, attachment related aspects of parenting may be especially protective for high-risk children. Individual or family risk factors that would by relevant to explore as moderators are: clinical levels of conduct and emotional problems, child gender, parent depression, and multiple socio-demographics risks. Knowledge of which aspects of parenting that provide the most protection for children with the highest level of risks has utility for intervention approaches to more effectively help the most vulnerable children and families.

6.13.2. Further research in the field

Findings from this study highlight a range of questions related to the association between different theoretical aspects of parenting and child functioning that would require new research studies. Further knowledge is valuable for strengthening intervention approaches for parents for enhancing child conduct and emotional outcomes, as these outcomes have implications for other important aspects of children lives (Dodge, 1983; Greco & Morris, 2005; Klein et al., 2013; Maguin & Loeber, 1996; McGee et al., 1988; Rudolph et al., 2008), and for outcomes in adulthood (Champion et al., 1995; Farrington, 1991; Fergusson et al., 2005; Rutter, 1996; Offord & Bennett, 1994; Simonoff et al., 2004).

This thesis examined only two aspects of positive parenting related to attachment and social learning theory, respectively. It would be important to explore further aspects of positive as well as negative parenting, originating in attachment theory and social learning theory, as predictors of child functioning. This includes examining how their interactions may be associated with child adjustment. It is conceivable that parent directives and commands, which are on the negative spectrum of parenting behaviours and have been found in research to be predictive of higher levels of child behavioural problems, may be less detrimental to child functioning in the context of early parenting that fosters secure attachment. Some combinations of parenting across theories may prove to be especially protective for child adjustment. A related issue is that the current study and many previous studies have used narrow aspects of parenting. There seems to be a need to use broader and multi-dimensional measures that constitute parenting 'types' of attachment and social learning parenting. Comparisons of these broader types of parenting could then be made in terms of their prediction of child functioning. The measure of attachment related parenting, the CARP, developed by Matias et al. (2006a), includes three dimensions of attachment related parenting (sensitive responding, parent positive affect, and mutuality) and would be a useful tool for further research. Equally, it would be important to have a broad measure that captured the full range of aspects associated with social learning theory, including complex and hard to measure aspects such as consistency and contingency of parenting behaviours.

In terms of further intervention research in light of findings from the current study, an important avenue would be to directly compare attachment based parenting programmes with programmes that use a social learning approach, in terms of their capacity to positively change child functioning. In a recent RCT with a sample of 4-9 year olds (N=320) with disruptive behaviour problems, Dunscombe et al. (2014) compared the effectiveness of an emotion and attachment based parenting programme (Tuning in to Kids, TIC) to a social

learning focused programme (Triple P). Both interventions were compared to a control group that received no intervention. Results showed that interventions had similar effect sizes in terms of reducing child behaviour problems at 6 months follow-up. As this study used a waitlist control group there was no scope for further evaluation of how interventions compare long-term. Future evaluations that compare these two types of parenting programmes should use long-term follow-up as differences in intervention effects may appear over time. Based on findings from the current study, the hypothesis would be that programmes that draw on attachment theory will have longer lasting effects, whilst effects of interventions that are strongly rooted in social learning theory would be expected to be short-lived. Furthermore, future intervention studies should evaluate effects also on emotional problems because of the high level of comorbidity in childhood between externalising and internalising problems (Angold et al., 1999), which may be explained by shared environmental risk factors such as parenting (Bubier et al., 2009; Hudson & Rapee, 2005; McKee et al., 2008).

As discussed above, many social learning based interventions contain attachment based components, and further research should examine these interventions in terms of the effectiveness and longevity of their respective theoretical components. A factorial trial design would be an appropriate approach for such assessment. This would involve randomising participants to four groups: 1) social learning components only 2) attachment components only, 3) both social learning and attachment components, and 4) control group. As discussed previously it would be important to assess interventions within an ample longitudinal timeframe to detect long-term effects. Bronfenbrenner's (1979) proposition that developmental effects can be delayed until children transition from one setting to another, such as starting preschool or school, might be a consideration when planning the timing of intervention follow-ups.

Another consideration for research in relation to components of parenting intervention is the malleability of attachment related parenting relative to social learning parenting. As noted earlier, the high continuity of parental warmth may indicate that this represents a personality trait and therefore is more heritable, compared to effective management that showed less continuity over time and may be acquired largely through learning. Therefore, social learning related parenting may be easier to target through intervention. This has important implications for what it is possible to achieve in parenting interventions in terms of what behavioural changes can realistically be expected of parents. Although, it has been demonstrated that parental sensitivity, which is the parenting aspect that has been most widely associated with child attachment security, can be manipulated through parenting intervention (Bakermans-Kranenburg et al., 2003). Therefore, there may be hope that other attachment parenting constructs are also malleable, such as warmth as examined in the current study, or other attachment parenting dimensions that have been shown to be associated with child security (De Wolff & Van Ijzendoorn, 1997).

Further systematic reviews and meta-analyses of existing evaluations of social learning and attachment based parenting interventions would be another important approach to comparing these theoretical aspects of parenting. There are many existing reviews of behavioural management and social learning oriented interventions (Cedar & Levant, 1990; Dretzke et al., 2009; Furlong et al., 2012; Serketich & Dumas, 1996; Stewart-Brown & Schrader-Mcmillan, 2011; Thomas & Zimmer-Gembeck, 2007) but only a few reviews of interventions based on attachment theory (Bakermans-Kranenburg et al., 2003, 2005; Van IJzendoorn, 1995). Social learning interventions and reviews of evaluations of these have been concerned mainly with child conduct problems, although sometime also emotional problems are included. Meanwhile, attachment based interventions have tended to focus on parenting behaviours such as sensitivity and child attachment status. Although, some

evaluations of attachment programmes, as mentioned above, have assessed effects on child behaviours (Lieberman et al., 2006; Moss et al., 2011; Van Zeijl et al., 2006). It would be important to systematically review attachment-based interventions in terms of their effects on both child conduct and emotional problems, in studies where these outcomes are available, and to examine how these interventions compare to effects achieved in social learning interventions. Considering that there may be delayed or sleeper effects in attachment focused interventions, one may not expect to find large effects on child outcomes because of the tendency for using evaluation designs with relatively short-term follow-ups. However, there may be trends for effects in the right direction that are likely to build further over time, as indicated by findings in the current study. In any new evaluations of attachment intervention that are carried out, it would be important to not only assess change in parenting and child attachment status, but also examine changes in child conduct and emotional functioning.

Findings from this study showed that aspects of parenting can differ with regards to having diminishing or enduring effects on child functioning. This has implications for the undertaking of future evaluation research on parenting interventions. Primarily it highlights the importance of evaluating interventions across an extended follow-up period that allows examination of effectiveness in childhood and preferably beyond. Other important aspects of intervention research, which have gained ground in the last decade, are the study of mediators and moderators of intervention effects (Kraemer et al., 2002). This kind of research should be reframed in terms of long-term effects of parent intervention. It is important to study *mediators* in parenting interventions in order to understand what mechanisms (parent behaviours) are causing programme effects on child outcomes. Future parenting intervention evaluation should extend mediation research to also test mediators in relation to the timing of effects on child functioning. It would be important to examine which

intervention induced changes mediate not just short-term but also long-term effects for children. Based on findings in the current study and in prior research (Tein et al., 2004; Zhou et al., 2008) it would be hypothesised that social learning parenting aspects (external mechanisms) will mediate short-term intervention effects on child functioning, and that attachment related parenting dimensions (internal mechanisms) will mediate longer term child adjustment. The study of *moderators* of intervention effect is concerned with questions of who benefits from intervention, and such research is invaluable for identifying for whom interventions are effective. Such knowledge can enable a better matching of individuals to interventions that are effective for their specific needs and circumstances (Kazdin & Weisz, 1998). Further moderation research should be examined with a long-term lens, as it would be important to establish if there are groups that benefit more or less as time passes. For some high-risk parents it might be especially difficult to keep up good parenting practices in the face of enduring challenges such as low income, depression, domestic violence, daily stress etc. Depletion of intervention effects over time in these vulnerable groups seems more likely than for parents faced with less contextual risks, although this hypothesis should be tested empirically.

6.14. Conclusion

The main aim of this study was to compare early positive parenting related to attachment theory (warmth) and social learning theory (effective management) as predictors of child conduct and emotional problems. This comparison was made by analysing these theoretical parenting dimensions simultaneously, thereby obtaining their unique and independent prediction of child outcomes. Results from this study showed that early parental warmth is an important protective factor for children's longitudinal outcomes. Early effective management, although it had short-term association with child functioning, was not

predictive positive of long-term child adjustment. Although, later school age effective management was predictive of lower concurrent child problems, but only in the context of early parental warmth. The contrasting associations of these respective theoretical aspects of parenting with children's functioning short-term and long-term might be explained by the underlying mechanisms linking parenting and child functioning. In social learning theory the focus is on external control mechanisms (praise, reward, punishment, modelling), this is in contrast to attachment theory where mechanisms are internal (internal working models). Results of this study suggest that intervention and prevention targeting parenting in early childhood should incorporate and emphasise programme components that focus on parenting that draws on attachment theory. There is a need for further research in the field of parenting that examines and compares the effect of parenting on child outcomes. This includes further evaluation of parenting interventions, using designs with long-term follow-up, and studying mediators and moderators of longitudinal child outcomes. Such research could inform the development of interventions that are more effective in changing trajectories of problems of vulnerable children towards more positive outcomes, not only in childhood but also in adolescence and in adulthood.

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APPENDICES

Appendix A: Overview of codes in the Relationship Affect Coding System (RACS)

RACS Outline

11-13, 31-33, 62 **VERBAL BEHAVIOR**

- CONVERSATION
  - 11 Positive Verbal
  - 12 Talk
  - 13 Negative Verbal
- BEHAVIOR CHANGE
  - 31 Positive Structure
  - 32 Directive
  - 33 Negative Directive

81-83 **PHYSICAL BEHAVIOR**

- 81 Positive Physical Contact
- 82 Physical Contact
- 83 Negative Physical Contact

43-49 **AFFECT BEHAVIOR**

- 43 Anger/Disgust
- 45 Validation
- 46 Distress
- 48 Positive Affect
- 49 Ignore

44, 55, 98, 99 **"OFF" CODES**

- 44 Neutral (Affect)
- 55 No Talk (Verbal)
- 88 No Physical (Physical)

(Source: Relationship Affect Coding System (RACS) Training Manual, Peterson et al., 2008)

Appendix B: Attachment and social learning parenting measures used in previous studies

Study	Methods (design, sample, population, measures, analysis)
O'Connor et al. 2013	• **Design:** RCT of Incredible Years + Supporting parents on Kids Education (SPOKES), one year follow-up (6 months post intervention). • **Sample:** N=174; 4-6 year olds from high need urban areas in London • **Observed parenting:** Procedure: 3 observational tasks: 1. Free play, 2. LEGO highly structured, 3. Tidy-up. <u>Attachment Parenting:</u> Coding of Attachment-Related Parenting (CARP) (Matias et al. 2006): Global measure using 7 point Likert scale with detailed definitions. *'Sensitive responding'*: a. Responsiveness to child's non-verbal seeking-behaviour, b. Reponsiveness to child's lost needing-behaviour, c. Responsiveness to child's verbal seeking-behaviour, d. Responsive engagement, e. Sensitive child mindedness, f. Responsive facilitation, g. Encouraging/promoting autonomy, h. Warmth *'Mutuality'* (dyadic based measure): a. Child initiated activity and involving parent, b. Interactive-reciprocal play/turn taking, c. Shared attention, positive affect matching, d. Mirroring/matching, e. Fluid conversation, f. Fluid conversion, g. Coordinated/shared body orientation. <u>Social Learning Parenting:</u> Parent Behaviour Coding Scheme (PBCS; adapted from Aspland 2001): Micro-social events using frequency counts of behaviours. *'Child-centred behaviours'*: a. praising child's behaviour, b. attending to and commenting on the child's activities, c. encouraging comments to child, d. request to child as questions in conditional sense, e. seeking child's cooperation by induction, f. facilitative remarks, g. references to child's thought and feelings. *'Child-directive behaviors'*: a. clear commands of the child, b. vague or uncertain commands of the child, c. prohibitions, d. criticism. • **Child Outcome**: o Attachment Classification: Manchester Attachment Story Task • **Data analysis:** bivariate correlations between changes in social learning parenting and changes in attachment parenting. Parenting dimensions not included simultaneously in models.

Matias et al. 2013	• **Design:** RCT (same as in O'Connor et al. 2013) • **Sample:** N=151 (only 2nd and 3rd cohort from original study as only for these are attachment measure was available) • **Observed parenting:** <u>Social Learning Parenting:</u> 'Child-centred' and 'child-directive' SL parenting behaviours as outlined in O'Connor et al. (2013) above are here factored into 3 factors: 1)'Positive attending' (attending, positive attending, praise, seeking cooperation, facilitating) 2) 'Directive parenting' (vague commands, clear commands, prohibitions) 3) 'Criticism' <u>Attachment Parenting: (as in O'Connor 2013)</u> 'Sensitive Responding', 'Mutuality' • **Child outcomes:** o MCAST (as above) o Peer nominations: (peer popularity 'like most', peer rejection 'like least', fighting behaviour 'fights') o British Picture Vocabulary Test • **Analysis:** Cross-sectional analysis of pre-treatment data. Parenting included simultaneously in models.

Matias 2006b	• **Design:** RCT (same as in O'Connor et al. 2013) • **Sample:** 86 (randomly selected from 174 of full sample) • **Observed parenting:** Procedure: 3 observational tasks: 1. Free play, 2. LEGO highly structured, 3. Tidy-up. Attachment Parenting: Coding of Attachment-Related Parenting (CARP) (Matias et al. 2006): Global measure using 7 point Likert scale with detailed definitions. *'Sensitive responding'* (as in O'Connor et al. 2013) *'Mutuality'* (as in O'Connor et al. 2013), *'Parent positive affect'*: a. parent's mood is clearly positive, b. parent shows enthusiasm, c. positive affect conveyed in verbal response to child, d. parent vocal quality conveys positive affect. Social Learning Parenting: Parent Behaviour Coding Scheme (PBCS; adapted from Aspland 2001): Micro-social events using frequency counts of behaviours. *'Parental attending'*: a. neutral parental attends to child, b. positive parental attends to child and praise (so only uses some items of positive parenting on the PBCS due to their theoretical relevance and based on reliability testing, O'Connor et al. 2013 include them all) *'Clear (alpha) commands'*: clear and unambiguous parental requests *'Beta commands'*: vague or ambiguous parental requests *'Chain commands'*: more than one parental request given in quick succession *'Criticism':* parental statement that express negative evaluation of child or behaviour. • **Child Outcomes:** o Attachment Classification: Manchester Attachment Story Task o Observed child behaviour: Child Global Coding Scheme ('attention on task', 'positive affect', 'social responsiveness', 'antisocial behaviour') o Parent interview measure of child behaviour: Parent Account of Children's Symptoms (PACS, Taylor et al 1986): 'conduct problems', 'hyperactivity'. o Parent and teacher questionnaire measure of child behaviour (SDQ, Goodman): 'conduct problems', 'hyperactivity', 'pro-social behaviour'. • **Analysis:** bivariate cross-sectional correlations using pre-treatment data. Parenting dimensions not included simultaneously in models.

Speltz et al. 1995	• **Design:** Discriminant analysis design • **Sample**: N=50 (25 clinic referred for ODD and clinical CBCL Aggression + 25 case matched comparison (age, SES, family structure), boys aged 3.5-5.5 and mothers. • **Observed parenting:** Procedure: videoed interactions in playroom Attachment measure: Cassidy & Marvin (1989) (global measure) Procedure: 4 min warm up play, 3 min separation, 3 min reunion, 3 min separation, 3 min reunion. *'Attachnent security'*: 9 point scale from 'very inseure' to 'very secure'. *'Separation behaviour'*: 25 item checklist on child separation distress Social learning measures: (microsocial/ quantified) Dyadic Parent-Child Interaction Coding System (DPICS): 5 min child-direct play, 5 min parent-directed play, toy put away task. Coded on frequency of 36 categories of parent and child behaviours. Parent behavioural variables: 'Child-directed talk' 'Critical statements' 'Total praise' 'Total commands' 'Responds to deviant behaviour' 'Playtalk' 'Positive/neutral physical contact' Child measures : 'Descriptive comments' 'Playtalk' 'Positive/neutral physical contact' 'Deviant behaviour' 'Compliance' • **Child measures**: o Diagostic Interview for Children and Adolescents (DICA): Oppositional Defiant Disorder o CBCL: Aggression subscale • **Analysis:** cross-sectional logistic regressions with both parenting dimensions not included simultaneously in models.

Tein et al. 2004 & Zhou et al. 2008	• **Design:** RTC of programme for divorcing families (New Beginnings: with component for mothers and a componen for children) T2 (postintervention, mediators), T5 (6 years follow-up, outcome). • **Sample:** N=218, children ranging from 9 to 12 at recruitment • **Reported parenting measures: (**putative mediators: T1 immediately post & T2 3 months) Attachment parenting: *'Mother-child relationship quality'*: Mother and child questionnaires (Acceptance and Rejection subscales of Children's Report of Parenting Behaviour Inventory + Parent-Adolescent Communication Scale) Social learning parenting: *'Maternal discipline':* Child and parent questionnaires (Consistency of Discipline subscale of Children's report of Parenting behaviour Inventory + Appropriate Discipline, Inappropriate Discipline, and Follow-through subscales from Oregon Discipline Scale). (both latent variables in SEM analysis) • **Child outcomes (T3: 6 months follow-up; Tein et al. 2008)** o *'Externalising':* Composite: parent reported CBCL externalising, child reported hostility, teacher reported acting out o *'Internalising':* Composite: parent reported CBCL internalising, child reported anxiety, teacher reported shy-anxious • **Adolescent outcomes (T5: 6 years follow-up; Zhou et al. 2008)** o *'Externalising':* CBCL parent and adolescent reported o *'Internalising':* CBCL parent and adolescent reported o *'Mental disorder symptoms':* child/adolescent reported computer-assisted versio of Diagnostic Interview Schedule o 'Substance use': Monitoring the Future Scale (self-reports) o 'Number of secual partners': self-reports o 'Competence': Coatsworth Competence Scale (adademic, activity involvement, peer relationships) (parent and child/adolescent reports) + Self Perception Profile for Children (self-esteem) (child/adolescent reports). o *'Grade Point Average'* (GPA): school performance provided by high school • **Analysis:** Parenting tested as mediators of short-term and long-term programme effects on child outcomes. Parenting dimensions not tested in the same model.

Appendix C: The Family Check-Up

Of the 731 participating families in the Early Steps study, half (N=367) were randomised to receive the Family Check-Up (FCU) parenting intervention. The FCU is a brief intervention underpinned by motivational interviewing and adapted from the Drinker's Check-Up (DCU), which has shown good longitudinal effects even after three sessions (Miller, 1996; Miller & Rollnick, 2002). The FCU was first developed for use with high risk adolescents (Dishion & Kavanagh, 2003; Dishion & Stormshak, 2007) and then adapted for use with toddlers to intervene during the 'terrible twos', which can be a challenging developmental period for parents (Shaw et al., 2006).

The FCU uses an ecological and individually tailored approach. It aims to develop a unique profile of the target family in terms of its functioning across multiple domains and to understand the broader contexts of the family. Then a personalised strategy is developed to address problem areas. In the Early Steps sample all families had an eligibility screening and baseline assessment at age 2, but after this only families randomly allocated to the treatment received the FCU intervention. First, there was an initial 'get to know you' (GTKY) meeting with a parent consultant who would explore parent concerns with regards to family difficulties that might affect child's wellbeing and functioning. Second, the next meeting was a feedback session where the results of the age 2 home assessment, involving observations of parent-child interactions and parent questionnaires, were shared with the family. The main aim of this meeting was to motivate and encourage parents to make changes by pointing out areas for development, emphasising family strengths, and creating goals for the family in partnership with parents. To support parents' goals, parent consultant would identify appropriate intervention services with good fit to the family's specific needs. Services included referrals to external community services and the offer of continued support from the parent consultant through follow-up sessions. These follow-up sessions would emphasise parenting practices, specifically parent consultants were trained in delivering Parent Management Training (PMT; Forgatch & Patterson, 2010), which is based on social learning principles and emphasises parenting skill such as positive parenting and child management techniques. Also other aspects of parenting, such as co-parenting, could be addressed in these follow-up sessions, as could issues relating to other circumstances of the family, such as housing or childcare.

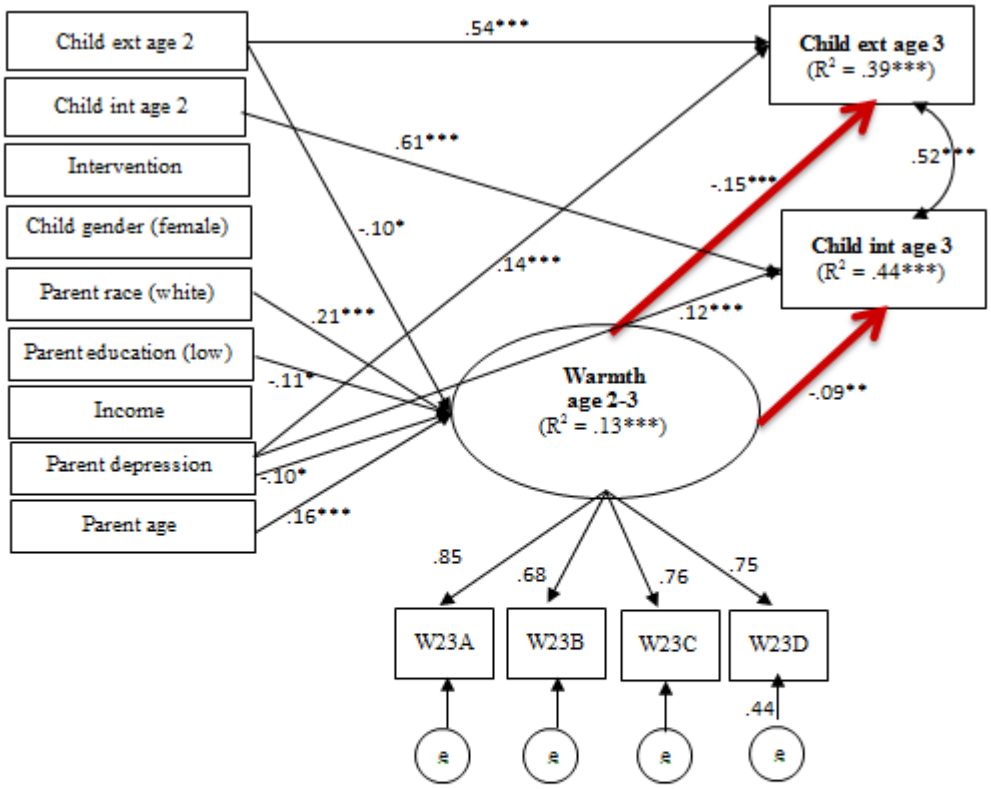
With regards to the qualification and training of the parent consultants delivering the intervention, these were educated to Masters or PhD level and all had previous experience with family intervention. They were trained for 2.5-3 months specifically in delivering the FCU, which included a range of techniques such motivational interviewing, dyadic instruction, and role playing. Parent consultants were supervised using video recordings of their sessions, and they were required to be certified prior to delivering the intervention, and on a yearly basis after this, to ensure intervention fidelity and prevent drift. Other measures that were taken to ensure fidelity were weekly video conferences between the intervention sites, and yearly parent consultant training meetings.

The intervention was delivered the first time after the age 2 assessment and thereafter families were offered the intervention on a yearly basis. In terms of intervention take up at child age two, 78% of the 367 participants randomised to the intervention attended the initial GTKY meeting and feedback session, and additional follow-up sessions were taken up by 35%, with an average of 3.32 (SD=2.84) sessions attended. At child age three, 65% of randomised families attended the core sessions, and 24% had additional sessions, averaging 2.83 (SD=2.70) sessions.

Previous intention to treat analyses of the Early Steps sample have shown that the FCU intervention is effective in preventing child problem behaviours and that this is mediated by parent's positive behaviour support which is a largely social learning related parenting construct (Dishion et al., 2008). Other analyses have shown that also maternal depression mediates improvements in both child externalising and internalising after accounting for mediation effect of parenting (Shaw et al., 2009). Another examination tested a wide range of socio-demographic and parent psychological risk factors as potential moderators of intervention effect, and showed that parent with low education and two parent families benefitted more from the intervention (Gardner et al., 20laun09). Also children who have high initial levels of behavioural problems have been found to be more responsive to the FCU intervention (Unpublished findings).

Appendix D: SEM and LGCM models research questions1 to 4

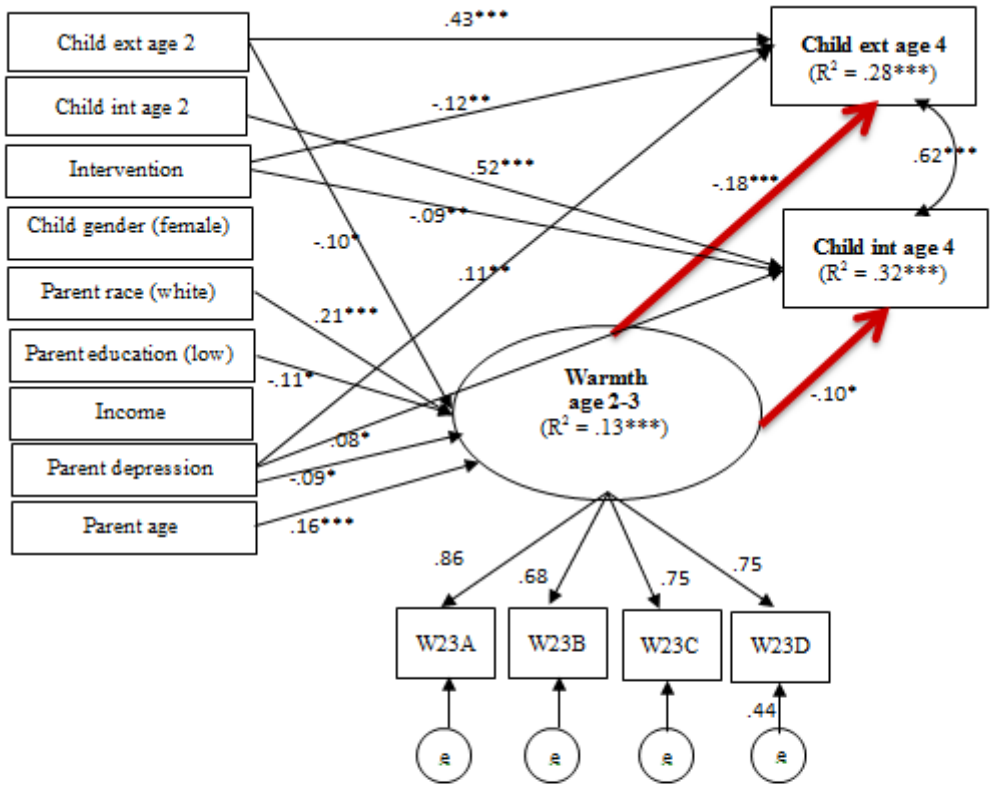
Figure 5.1.4: Parental warmth at age 2-3 predicting externalising and internalising at age 3



Model fit: RMSEA = .011; CFI = .998; TLI = .996; WRMR = .553

Notes:
WLSMV estimator used
Only significant paths are shown
Numbers are standardised coefficients
Ratio of observations to free parameters: 649:44 = 15:1
*p<.05, ** p<.01, ***p<.001

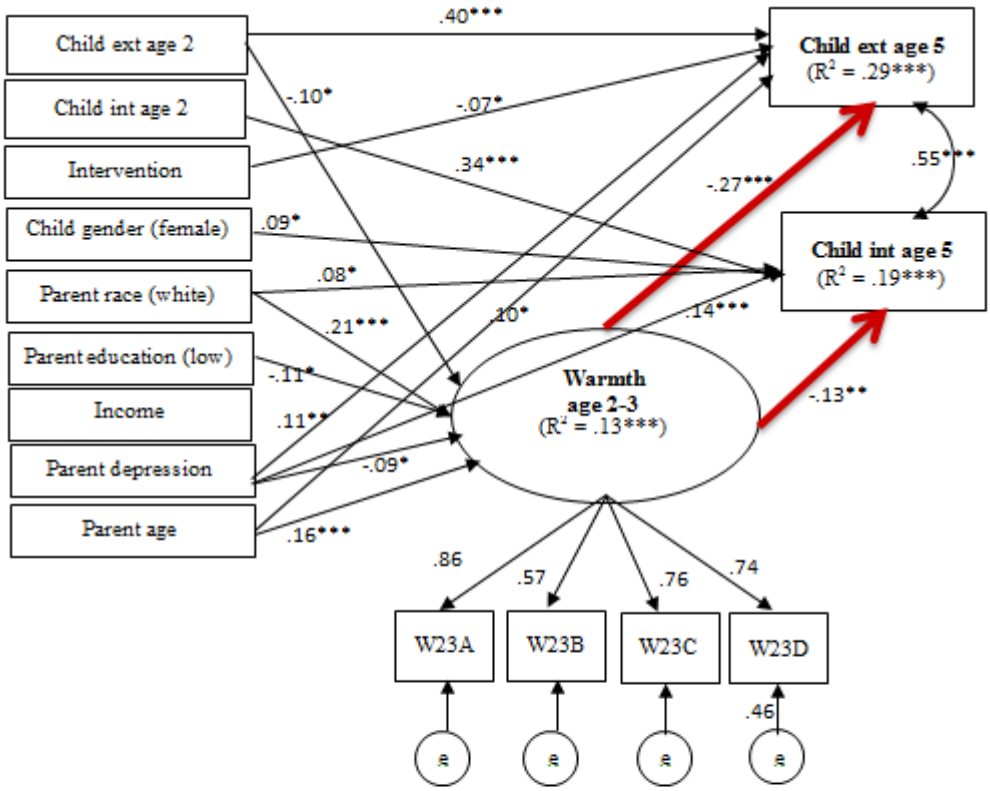
Figure 5.1.5: Parental warmth at age 2-3 predicting externalising and internalising at age 4



Model fit: RMSEA = .020; CFI = 0.992; TLI = 0.994; WRMR = .604

Notes:
WLSMV estimator used
Only significant paths are shown
Figures are standardised coefficients
Ratio of observations to free parameters: 663:44 = 15:1
*p<.05, ** p<.01, ***p<.001

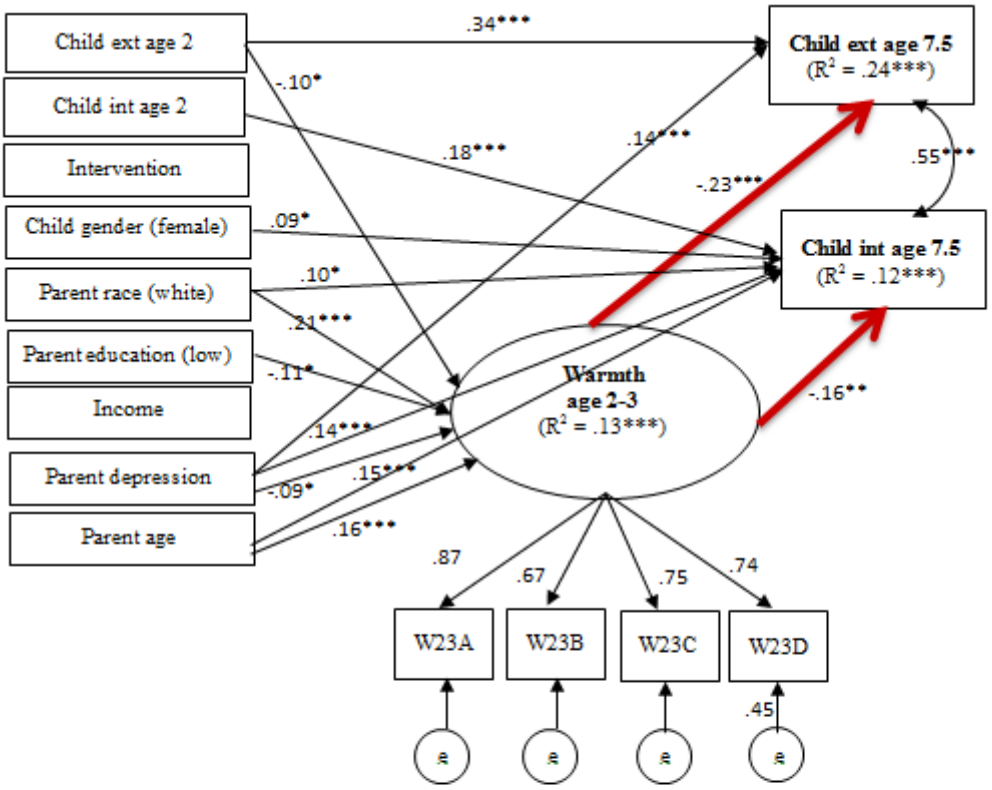
Figure 5.1.6: Parental warmth at age 2-3 predicting externalising and internalising at age 5



Model fit: RMSEA = .002; CFI = 1.000; TLI = 1.000; WRMR = .524

Notes:
WLSMV estimator used
Only significant paths are shown
Figures are standardised coefficients
Ratio of observations to free parameters: 672:44 = 15:1
*p<.05, ** p<.01, ***p<.001

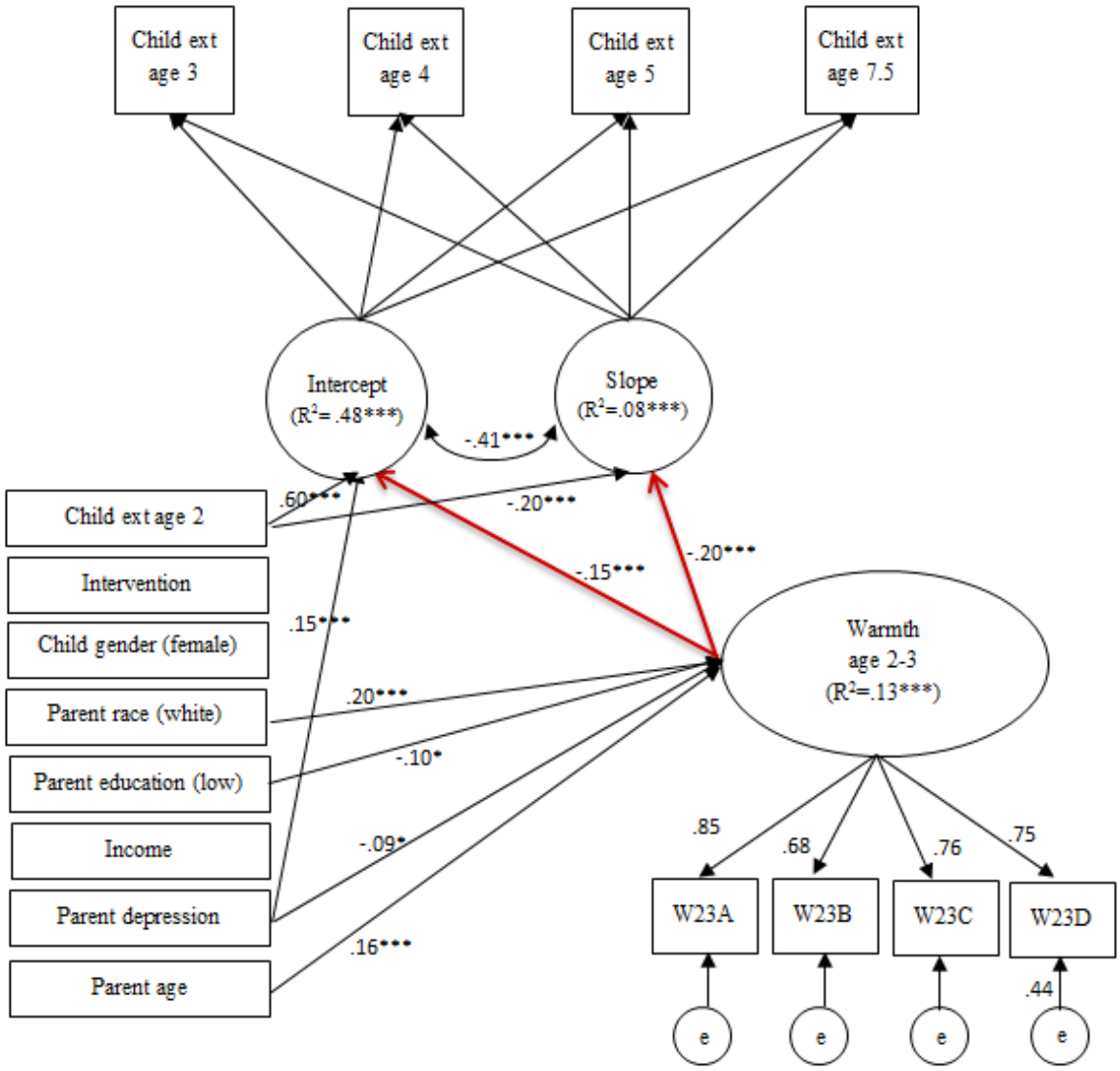
Figure 5.1.7: Parental warmth at age 2-3 predicting externalising and internalising at age 7.5



Model fit: RMSEA = .021; CFI = 0.989; TLI = 0.979; WRMR = .601

Notes:
WLSMV estimator used
Only significant paths are shown
Figures are standardised coefficients
Ratio of observations to free parameters: 669:44 = 15:1
*p<.05, ** p<.01, ***p<.001

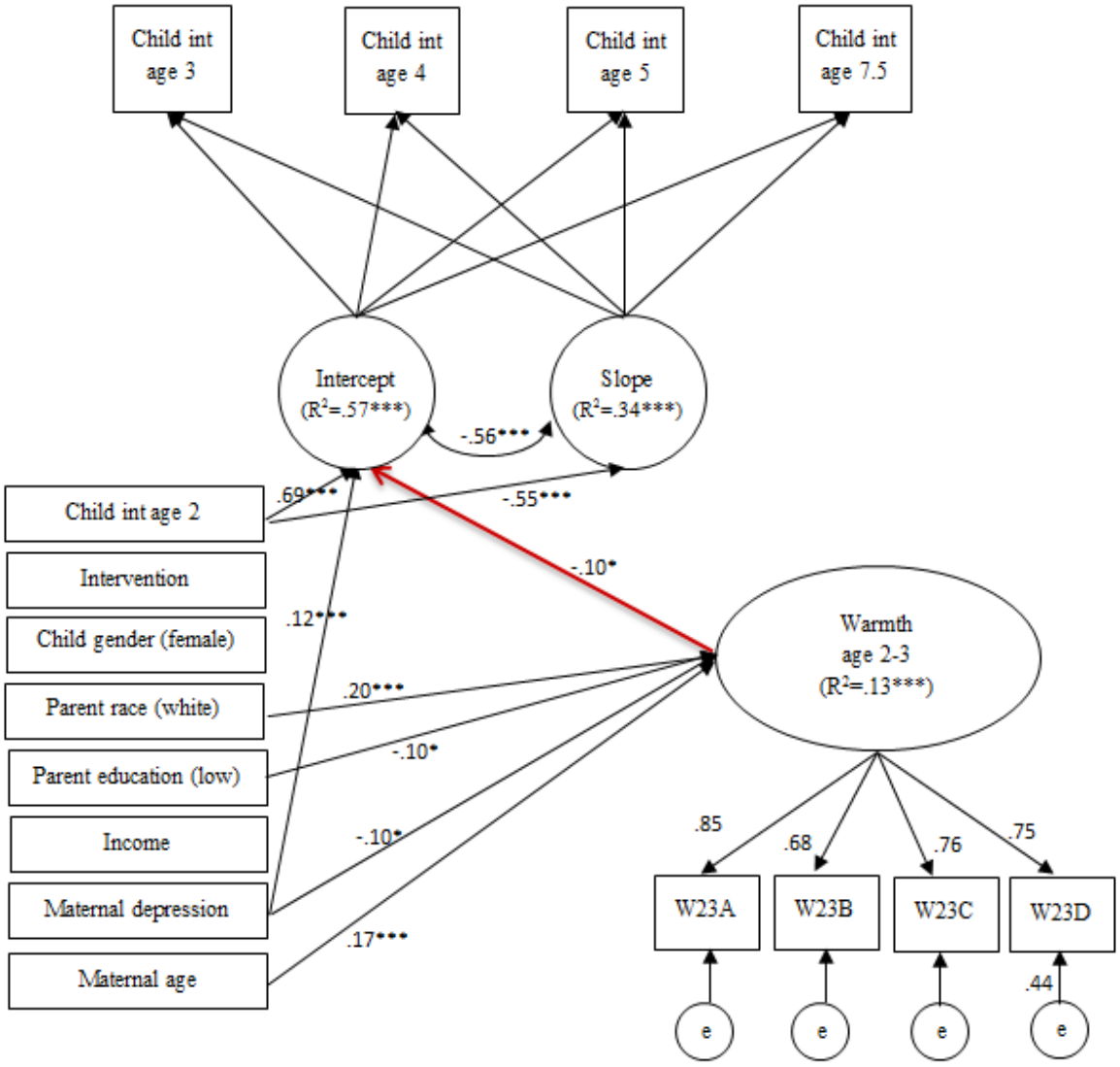
Figure 5.1.8: Parental warmth at age 2-3 predicting trajectories of child <u>externalising</u> age 3 to 7.5



Model fit: RMSEA = .000; CFI = 1.000; TLI = 1.000; WRMR = .545

Notes:
WLSMV estimator used
Only significant paths are shown
Numbers are standardised coefficients
Ratio of observations to free parameters: 685:49 = 14:1
*p<.05, ** p<.01, ***p<.001

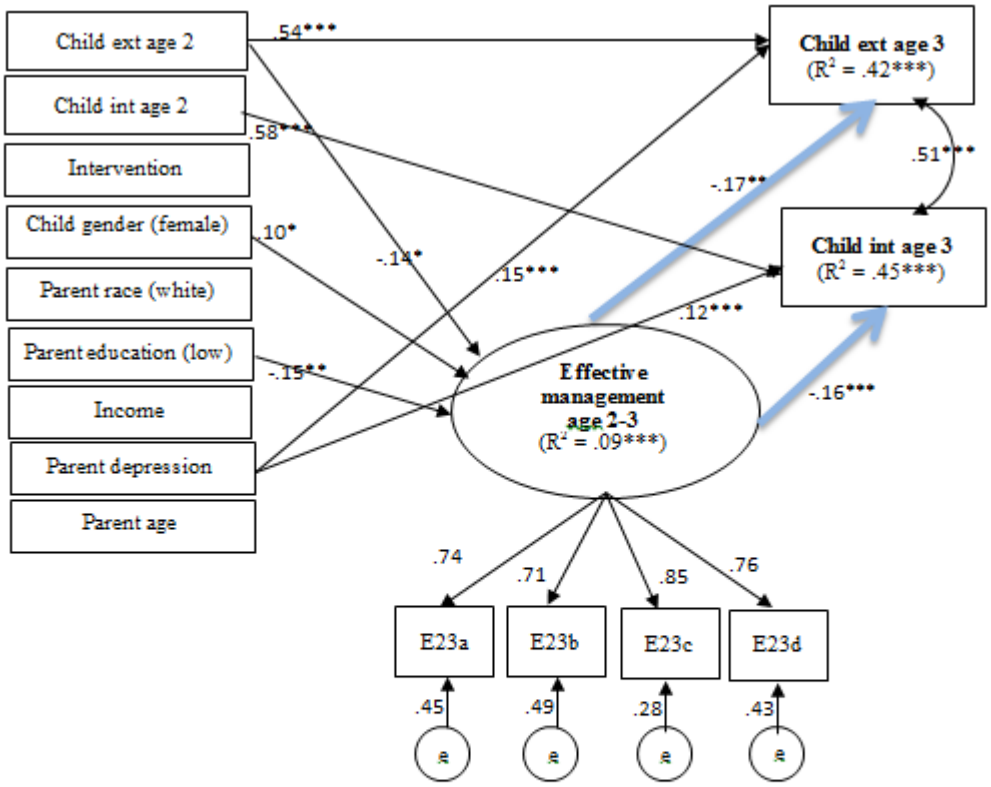
Figure 5.1.9: Parental warmth at age 2-3 predicting trajectories of child <u>internalising</u> age 3 to 7.5



Model fit: RMSEA = .025; CFI = .987; TLI = .980; WRMR = .706

Notes:
WLSMV estimator used
Only significant paths are shown
Numbers are standardised coefficients
Ratio of observations to free parameters: 685:49 = 14:1
*p<.05, ** p<.01, ***p<.001

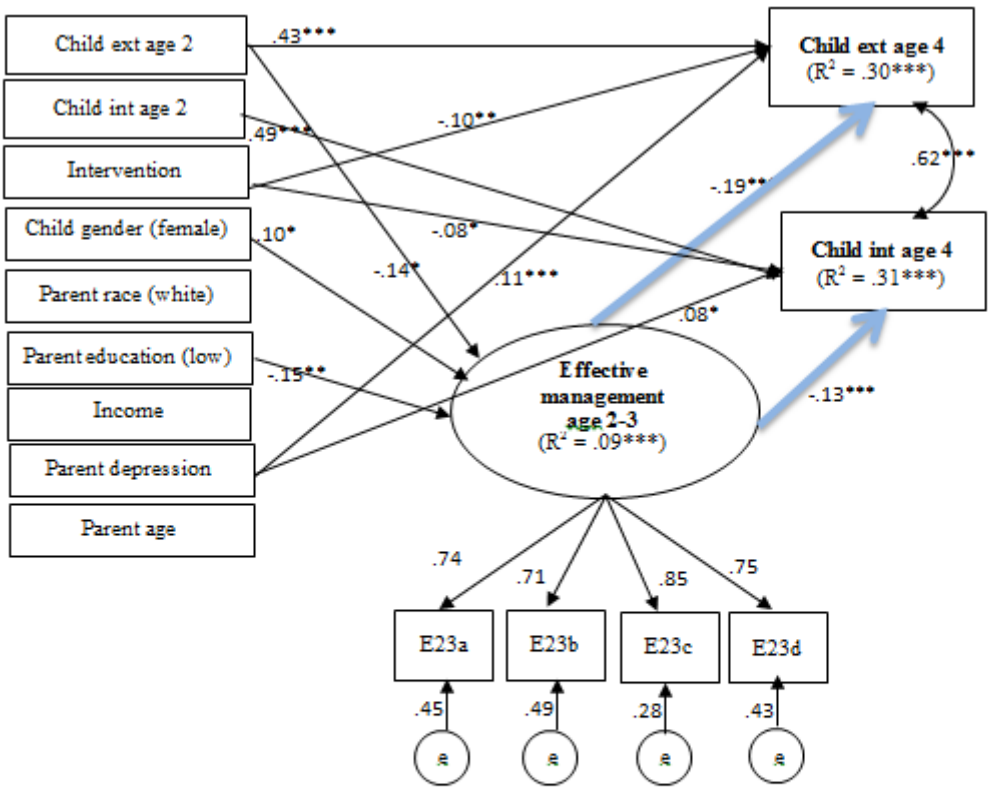
Figure 5.2.4: Parental effective management at age 2-3 predicting externalising and internalising at age 3



Model fit: RMSEA = .018; CFI = 0.995; TLI = 0.991; SRMR = .015

Notes:
MLR estimator used
Only significant paths are shown
Figures are standardised coefficients
Ratio of observations to free parameters: 649:44 = 15:1
*p<.05, ** p<.01, ***p<.001

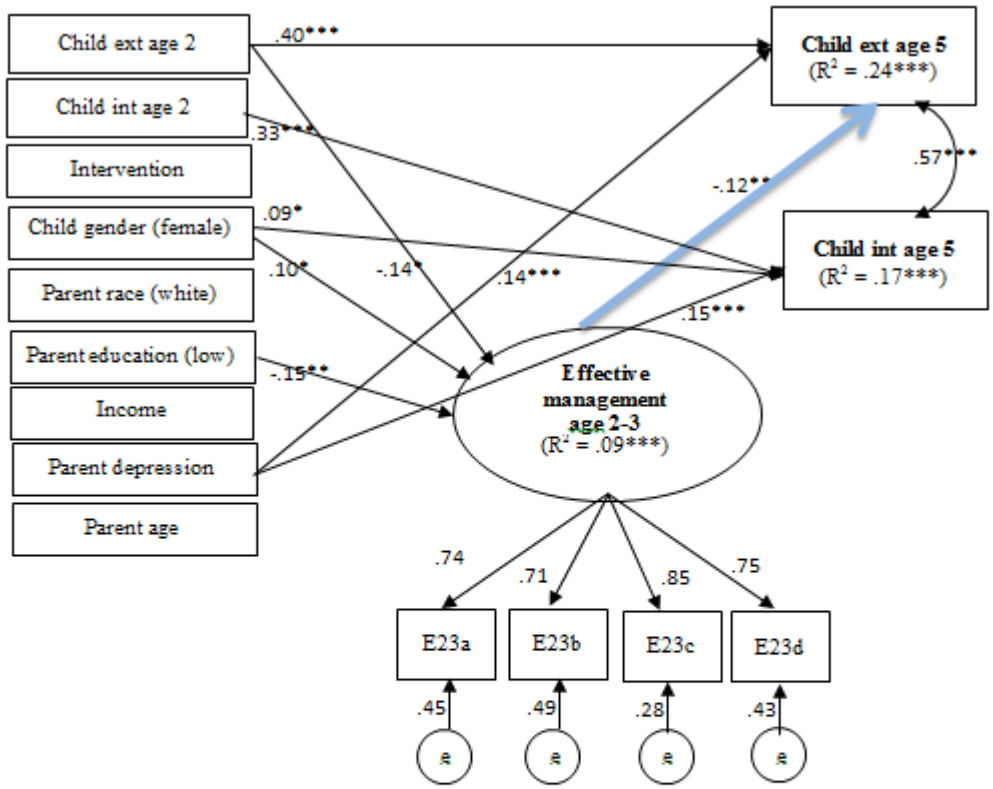
Figure 5.2.5: Parental effective management at age 2-3 predicting externalising and internalising at age 4



Model fit: RMSEA = .022; CFI = 0.993; TLI = 0.986; SRMR = .015

Notes:
MLR estimator used
Only significant paths are shown
Figures are standardised coefficients
Ratio of observations to free parameters: 654:44 = 15:1
*p<.05, ** p<.01, ***p<.001

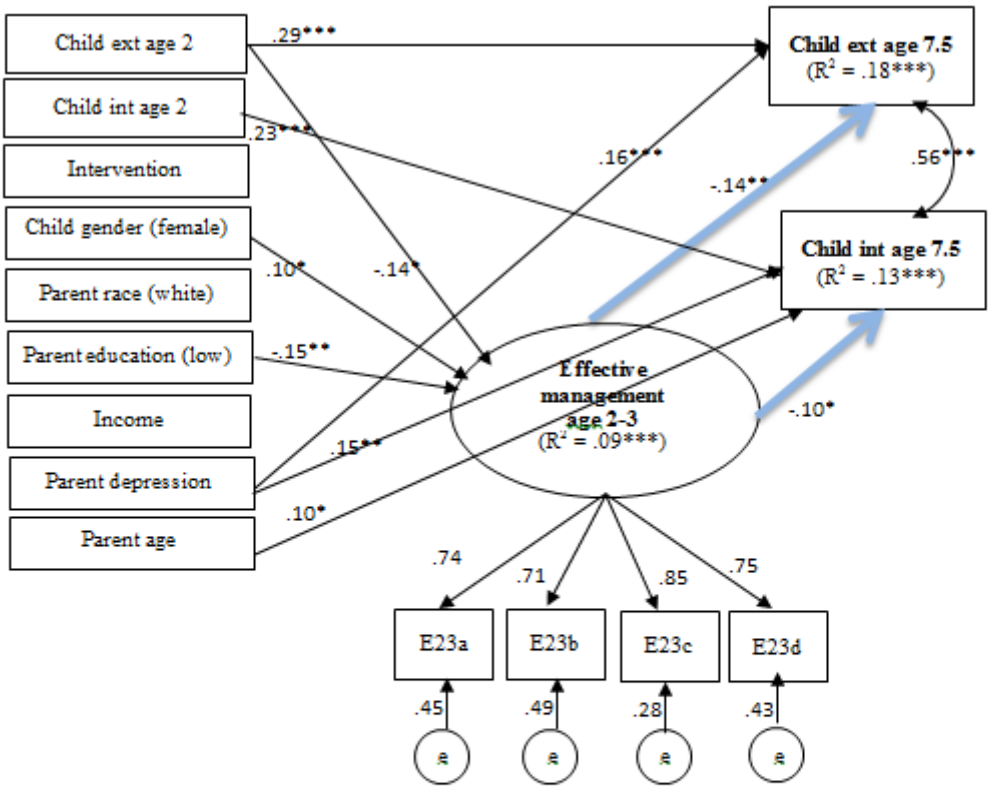
Figure 5.2.6: Parental effective management at age 2-3 predicting externalising and internalising at age 5



Model fit: RMSEA = .017; CFI = 0.995; TLI = 0.990; SRMR = .016

Notes:
MLR estimator used
Only significant paths are shown
Figures are standardised coefficients
Ratio of observations to free parameters: 658:44 = 15:1
*p<.05, ** p<.01, ***p<.001

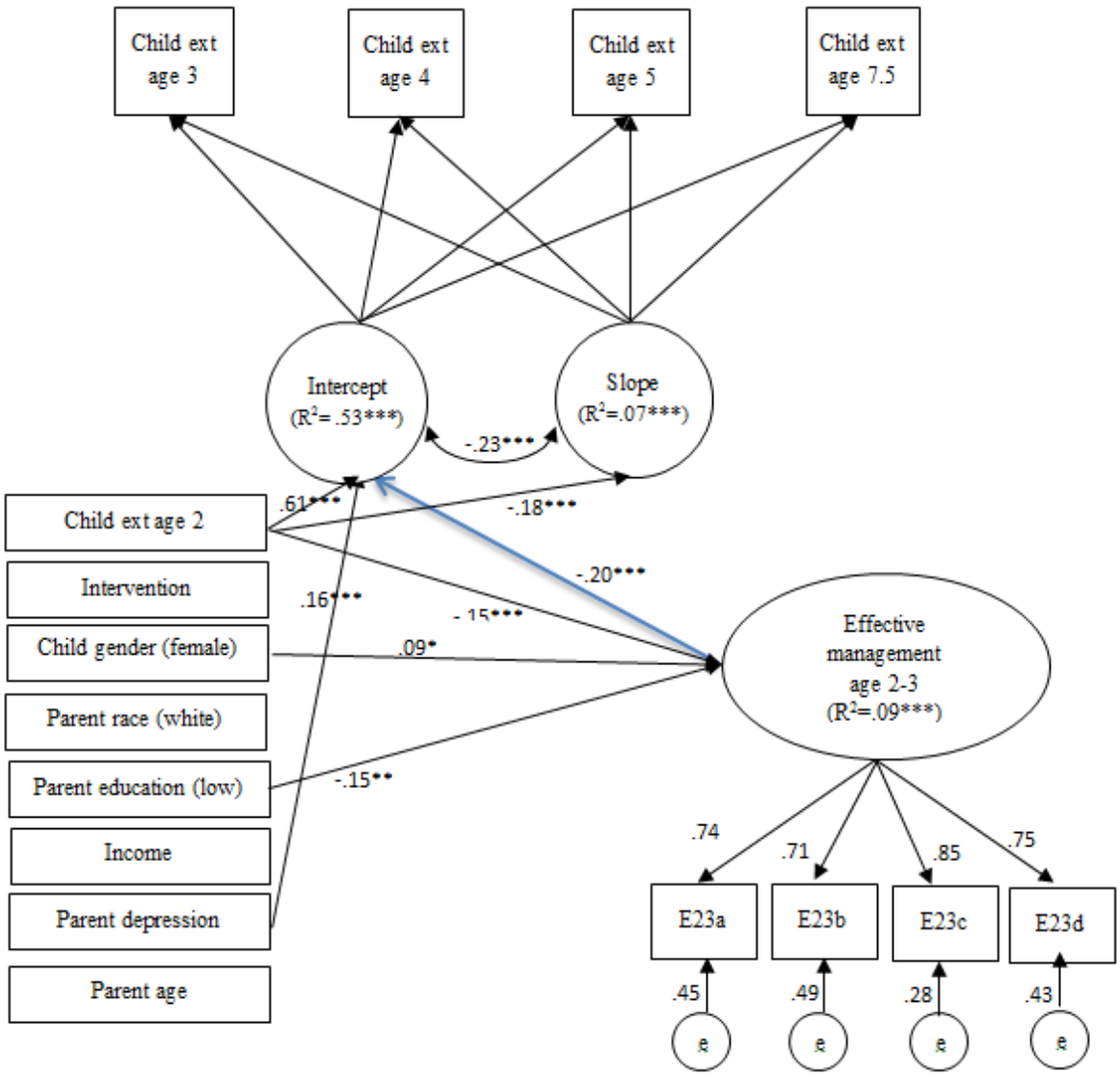
Figure 5.2.7: Parental effective management at age 2-3 predicting externalising and internalising at age 7.5



Model fit: RMSEA = .025; CFI = 0.998; TLI = 0.977; SRMR = .018

Notes:
MLR estimator used
Only significant paths are shown
Figures are standardised coefficients
Ratio of observations to free parameters: 653:44 = 15:1
*p<.05, ** p<.01, ***p<.001

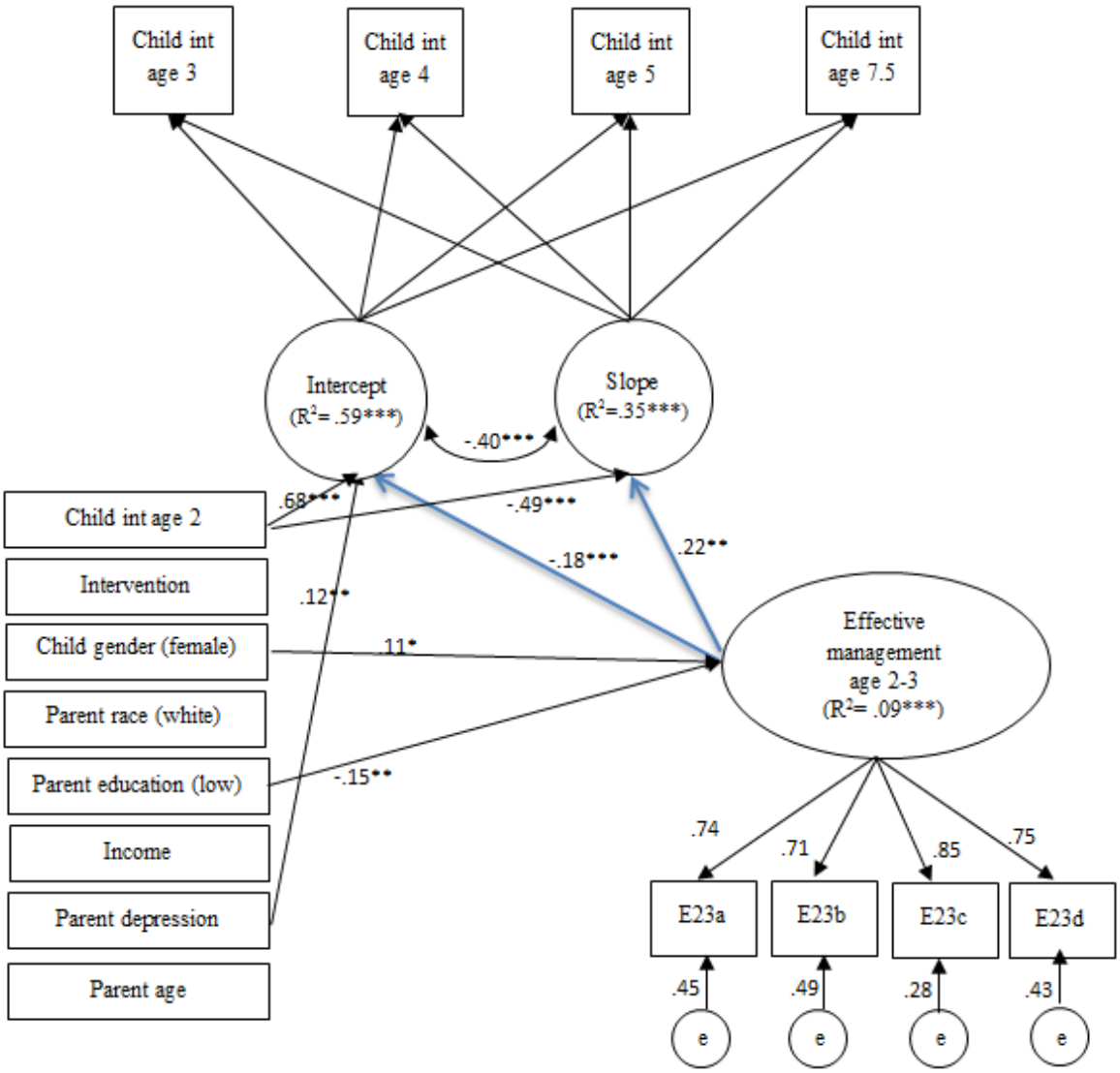
Figure 5.2.8: Parental effective management at age 2-3 predicting trajectories of child <u>externalising</u> age 3 to 7.5



Model fit: RMSEA = .011; CFI = .998; TLI = .997; SRMR = .018

Notes:
MLR estimator used
Only significant paths are shown
Numbers are standardised coefficients
Ratio of observations to free parameters: 685:49 = 14:1
*p<.05, ** p<.01, ***p<.001

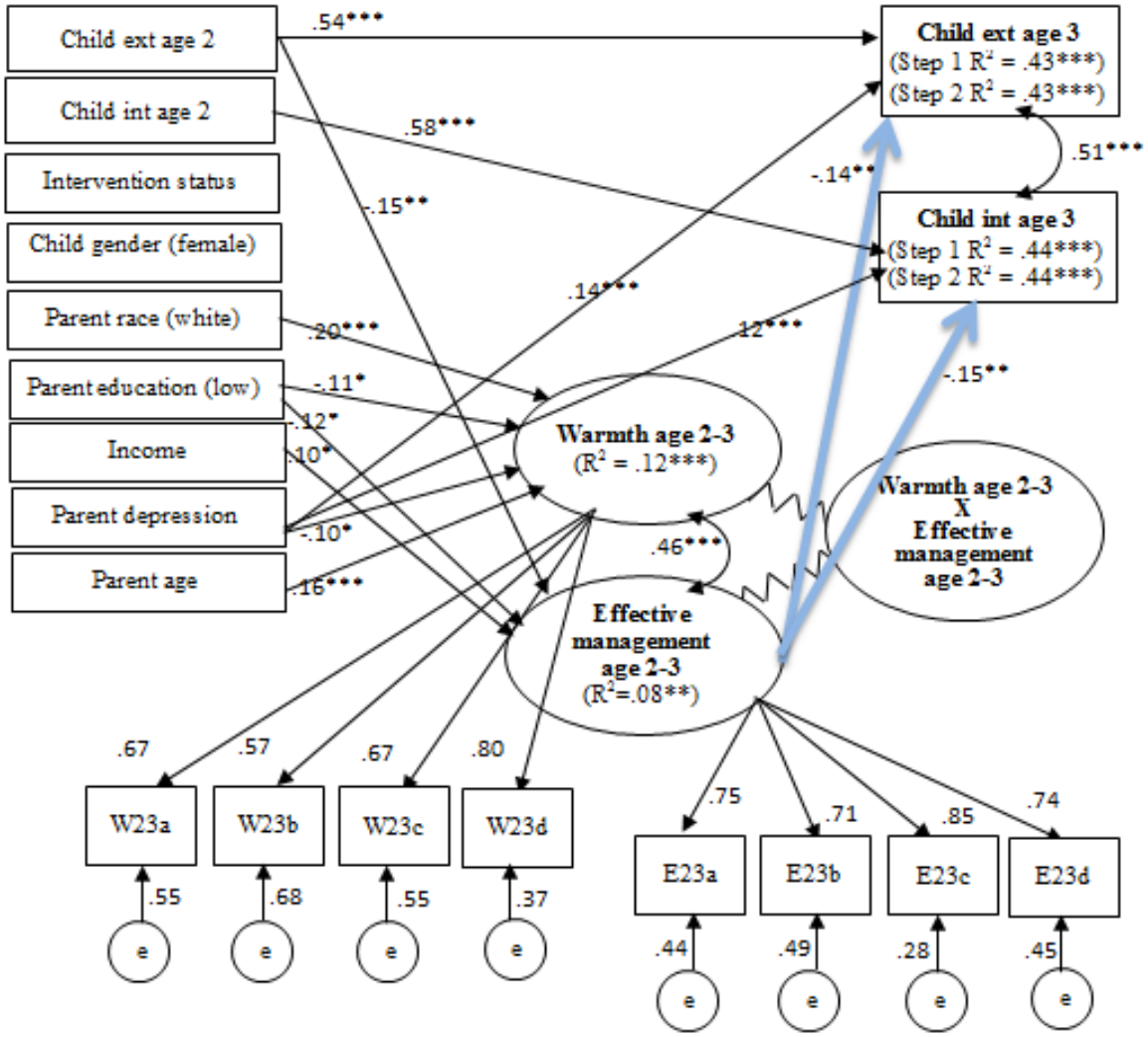
Table 5.2.9: Parental effecting management at age 2-3 predicting trajectories of child <u>internalising</u> age 3 to 7.5



Model fit: RMSEA = .026; CFI = .986; TLI = .978; SRMR = .023

Notes:
MLR estimator used
Only significant paths are shown
Numbers are standardised coefficients
Ratio of observations to free parameters: 685:49 = 14:1
*p<.05, ** p<.01, ***p<.001

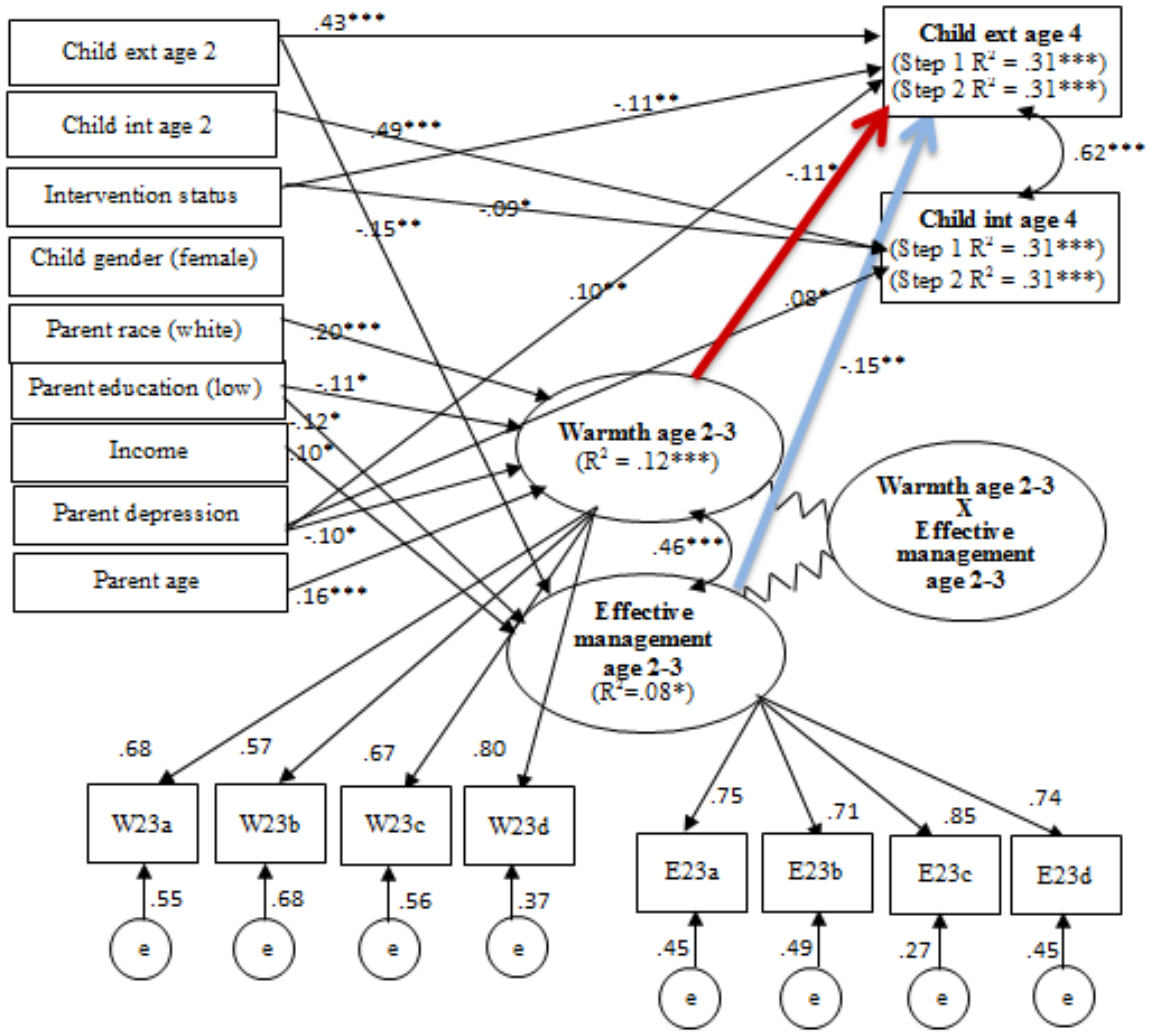
Figure 5.3.4: Parental warmth and effective management at age 2-3 predicting externalising and internalising at age 3



Model fit: RMSEA = .018; CFI = 0.992; TLI = 0.988; SRMR = .022

Notes:
MLR estimator
Only significant paths are shown
Figures are standardised coefficients
Ratio of observations to free parameters: 649:68 = 10:1 (main model), 649:70 = 9:1 (interaction model)
Step 1: model with main effect, Step 2: model including interaction term
*p<.05, ** p<.01, ***p<.001

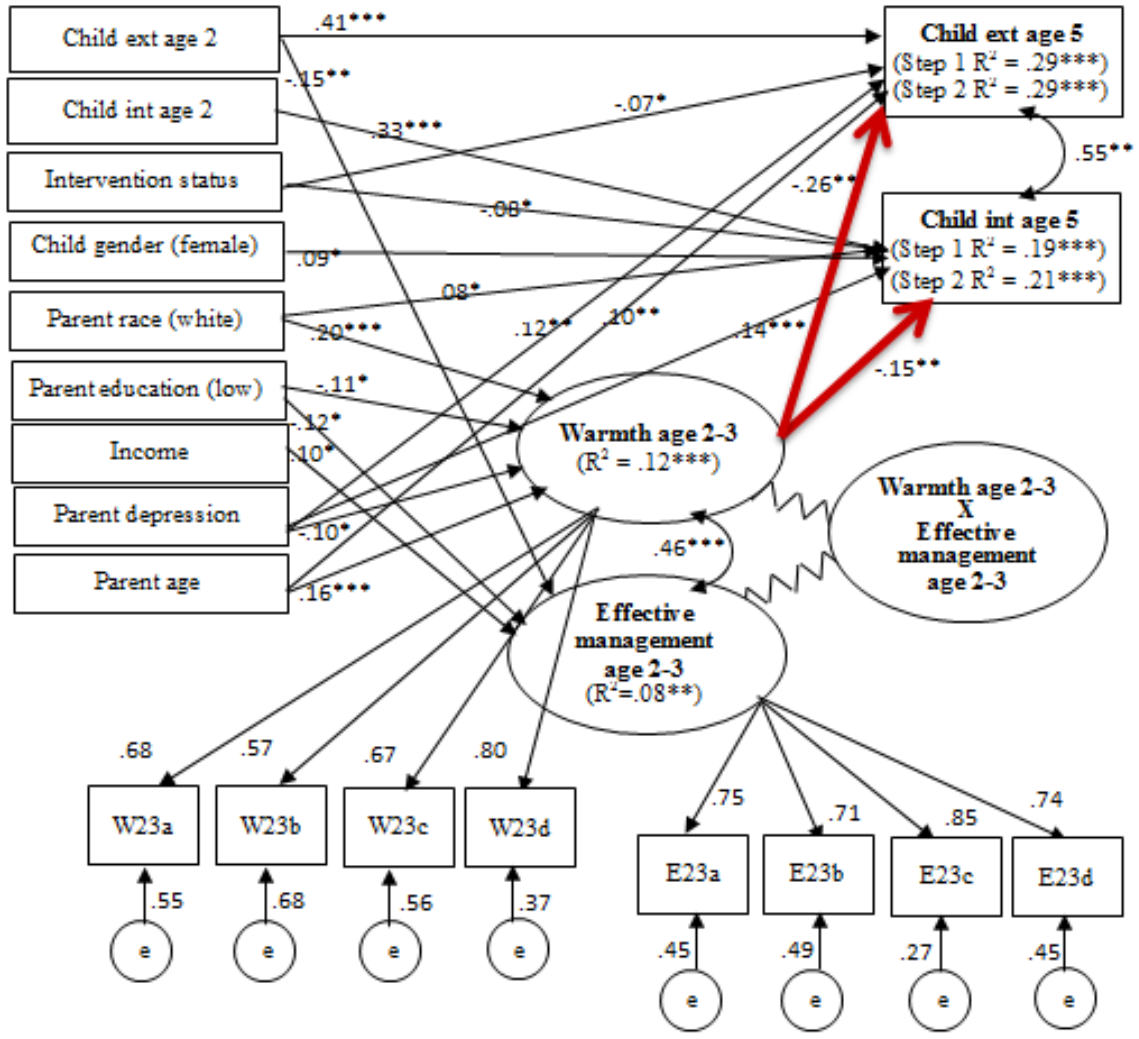
Figure 5.3.5: Parental warmth and effective management at age 2-3 predicting externalising and internalising at age 4



Model fit: RMSEA = .022; CFI = 0.988; TLI = 0.982; SRMR = .022

Note:
MLR estimator
Only significant paths are shown
Figures are standardised coefficients
Ratio of observations to free parameters: 663:68 = 10:1 (main model), 663:68 = 10:1 (interaction model)
Step 1: model with main effect, Step 2: model including interaction term
*p<.05, ** p<.01, ***p<.001

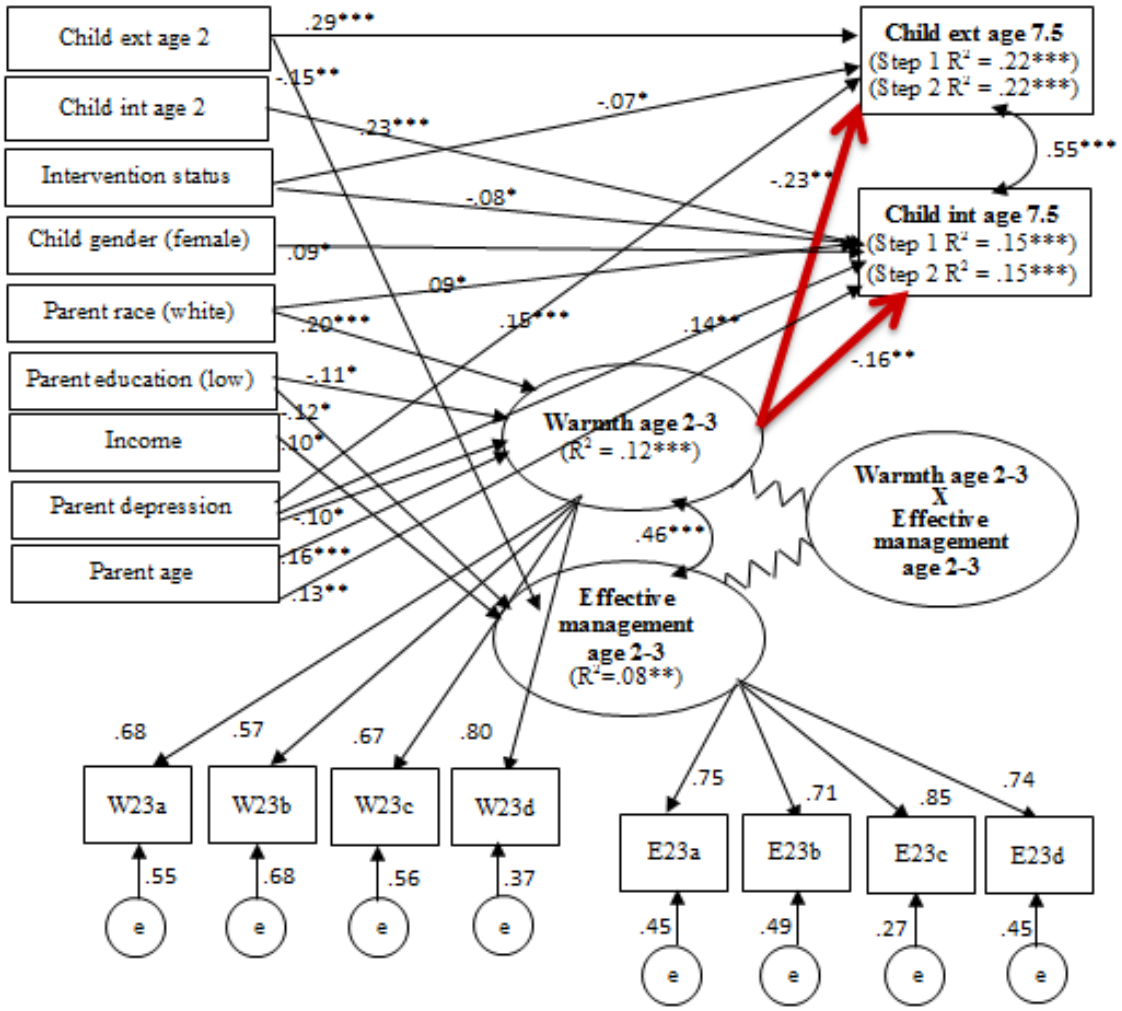
Figure 5.3.6: Parental warmth and effective management at age 2-3 predicting externalising and internalising at age 5



Model fit: RMSEA = .016; CFI = 0.992; TLI = 0.988; SRMR = .022

Notes:
MLR estimator
Only significant paths are shown
Figures are standardised coefficients
Ratio of observations to free parameters: 672:68 = 10:1 (main model), 672:70 = 10:1 (interaction model)
Step 1: model with main effect, Step 2: model including interaction term
*p<.05, ** p<.01, ***p<.001

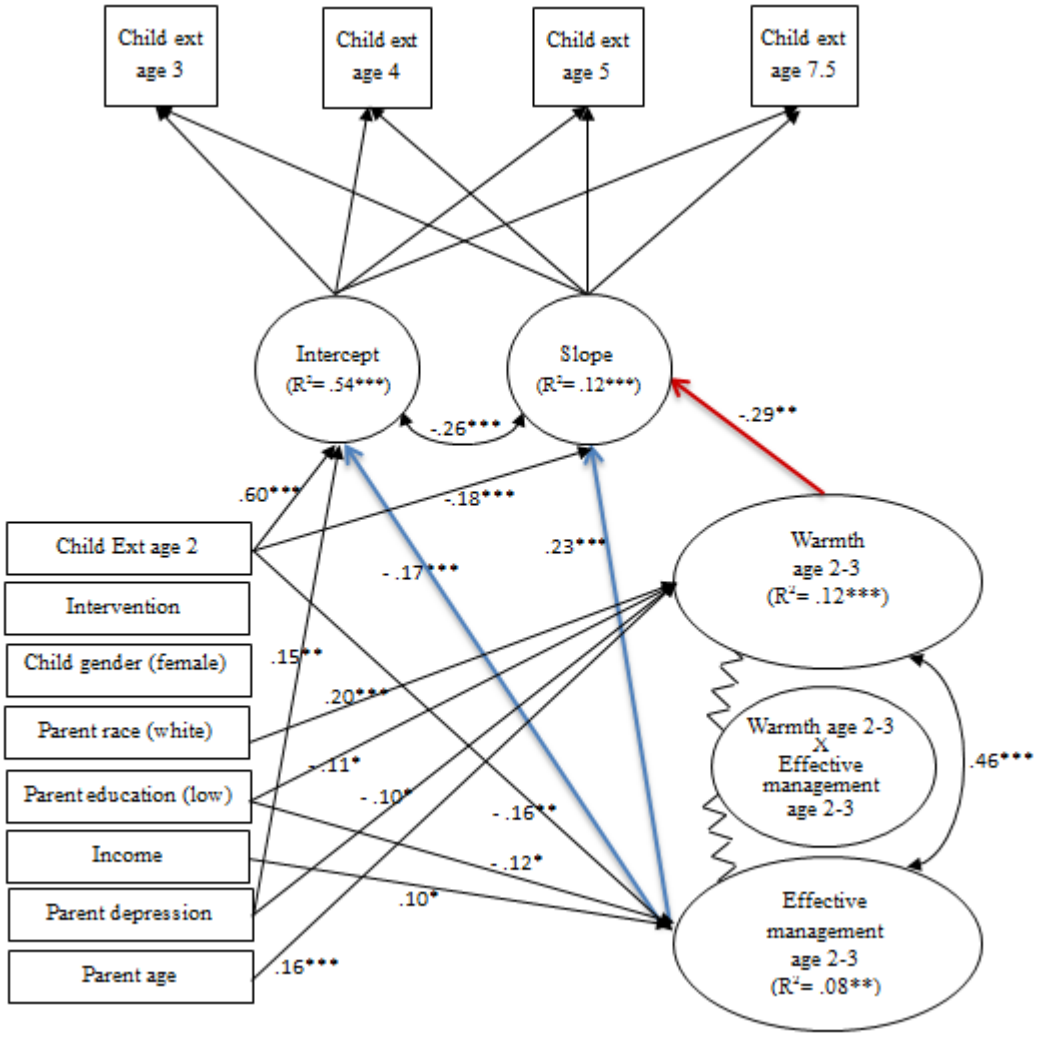
Figure 5.3.7: Parental warmth and effective management at age 2-3 predicting externalising and internalising at age 7.5



Model fit: RMSEA = .022; CFI = 0.986; TLI = 0.978; SRMR = .024

Notes:
Only significant paths are shown
Figures are standardised coefficients
Ratio of observations to free parameters: 669:68 = 10:1 (main model), 669:70 = 10:1 (interaction model)
Step 1: model with main effect, Step 2: model including interaction term
*p<.05, ** p<.01, ***p<.001

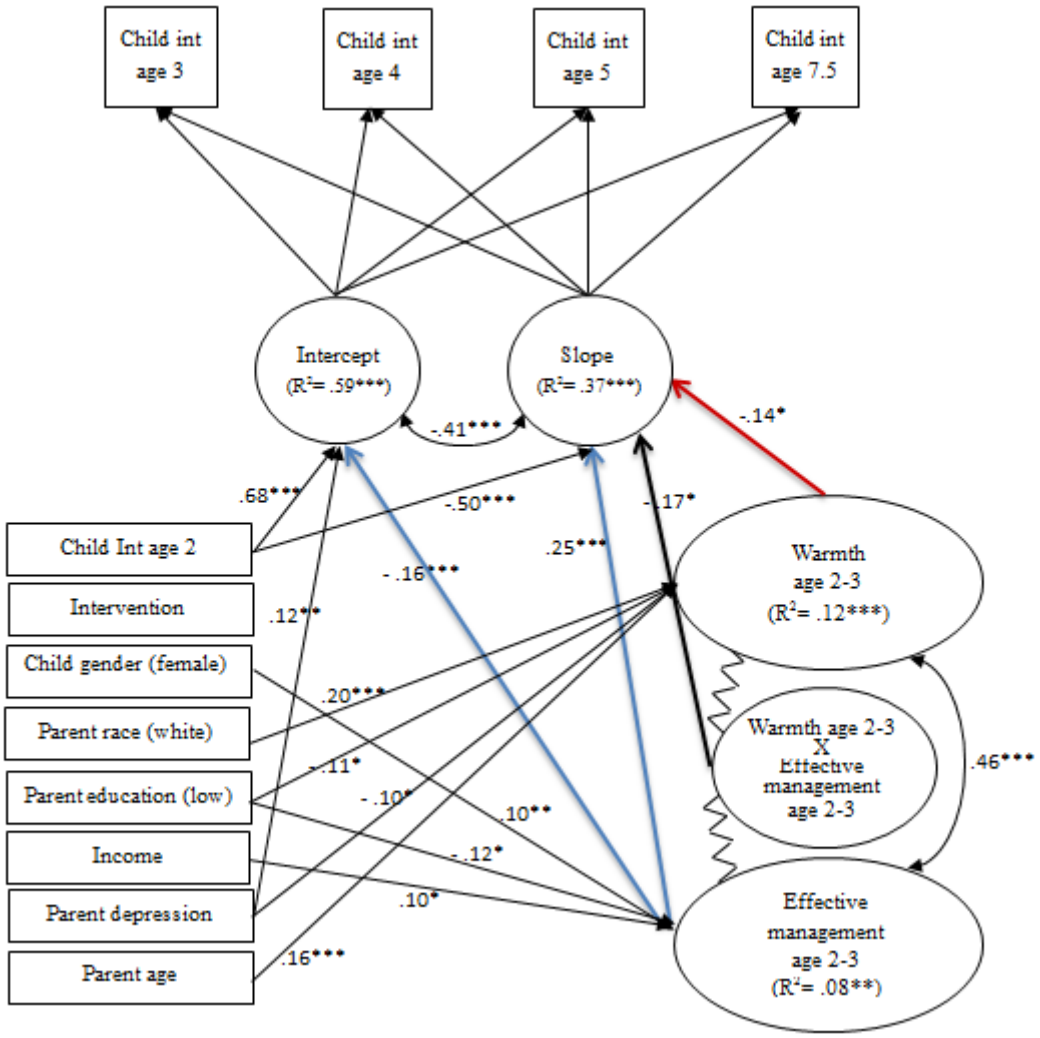
Figure 5.3.8: Parental warmth and effective management at age 2-3 predicting trajectories of child <u>externalising</u> age 3 to 7.5



Model fit: RMSEA = .012; CFI = .996; TLI = .994; SRMR = .023

Notes:
MLR estimator used
Only significant paths are shown
Indicators for latent parenting variable warmth are not shown
Numbers are standardised coefficients
Ratio of observations to free parameters: 685:72 = 10:1
*p<.05, ** p<.01, ***p<.001

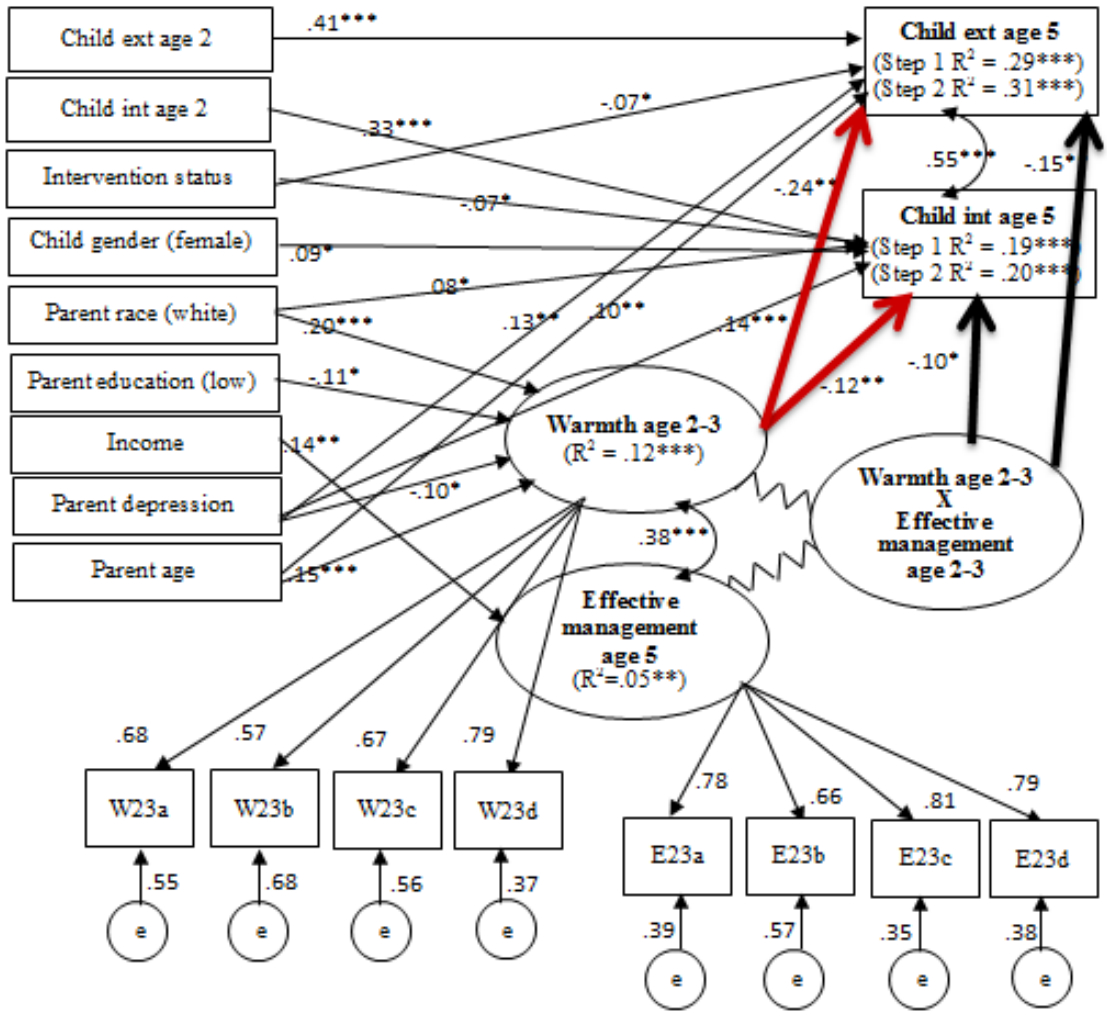
Figure 5.3.9: Parental warmth and effective management at age 2-3 predicting trajectories of child <u>internalising</u> age 3 to 7.5



Model fit: RMSEA = .023; CFI = .984; TLI = .977; SRMR = .026

Notes:
MLR estimator used
Only significant paths are shown
Indicators for latent parenting variable warmth are not shown
Numbers are standardised coefficients
Ratio of observations to free parameters: 685:72 = 10:1
*p<.05, ** p<.01, ***p<.001

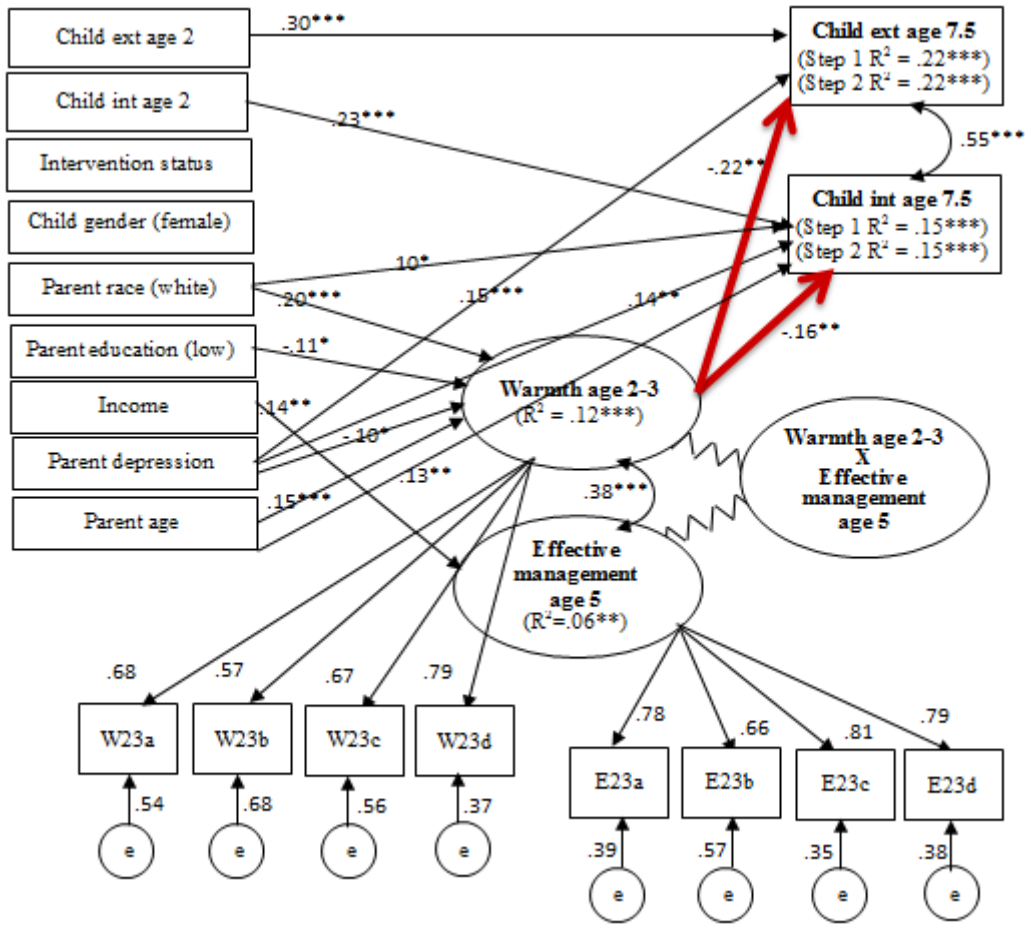
Figure 5.4.4: Parental warmth at age 2-3 and effective management at age 5 predicting externalising and internalising at age 5



Model fit: RMSEA = .023; CFI = 0.985; TLI = 0.977; SRMR = .024

Notes:
MLR estimator
Only significant paths are shown
Figures are standardised coefficients
Ratio of observations to free parameters: 673:68 = 10:1 (main model), 673:70 = 10:1 (interaction model)
Step 1: model with main effect, Step 2: model including interaction term
*p<.05, ** p<.01, ***p<.001

Figure 5.4.5: Parental warmth at age 2-3 and effective management at age 5 predicting externalising and internalising at age 7.5



Model fit: RMSEA = .025; CFI = 0.980; TLI = 0.969; SRMR = .025

Notes:
Only significant paths are shown
Figures are standardised coefficients
Ratio of observations to free parameters: 675:68 = 10:1 (main model), 675:70 = 10:1 (interaction model)
Step 1: model with main effect, Step 2: model including interaction term
*p<.05, ** p<.01, ***p<.001