The Influence of Early Child Care Arrangements and Psychological Characteristics on Child Development

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To all young women wondering.

It will be hard

but yes, you can

Certificate of Original Authorship

I, Andrea Papaloizou, declare that this thesis is submitted in fulfilment of the requirements for the award of Doctor of Philosophy (Clinical Psychology) in the Graduate School of Health at the University of Technology Sydney. This thesis is wholly my own work unless otherwise referenced or acknowledged.

In addition, I certify that all information sources and literature used are indicated in the thesis. This document has not been submitted for qualifications at any other academic institution. This research is supported by the Australian Government Research Training Program.

Signature: Production Note:
Signature removed prior to publication.

Date: 3 Dec 2021

Format of Dissertation

This dissertation is presented as a conventional dissertation. It consists of a series of chapters which include an introduction, a literature review, and the results and discussion from a longitudinal cohort study.

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Impact of SARS-CoV-2 on Research

I would like to acknowledge that half of this project was undertaken during the Severe Acute Respiratory Syndrome-Coronavirus-2 (SARS-CoV-2 or COVID-19) pandemic. Unfortunately, as a result, some unforeseen challenges interrupted and challenged this research.

The second and third data collection points that fell during 2020 aimed to assess how children adjusted to commencing kindergarten. In 2020, parents were obliged to keep children at home for a significant portion of the year, which impacted data collection and completion rates. Both parents and teachers were asked to complete lengthy surveys. The responses were limited, which may be partly accounted for by the increased stress placed on parents. Teachers were also overburdened with additional online teaching tasks or were not in the school environment at the time of data collection, which also impacted completion rates. Data collection was unable to take place in Catholic schools as most dioceses halted all external research, which again impacted recruitment. The unforeseen impacts of the COVID-19 public health orders, parental anxiety and other unknowns on children's mental health may have affected the results of the study. This required alternative ways to be found to tell the story which had originally been envisaged within the context of the research thesis.

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Glossary of Key Terms

Term	Definition
Day Care/Centre Based Care (CBC)	Care solely, or mostly, provided by a formal organisation in a group setting, such as day care, family day care, long day care or preschool.
Early Child Care Arrangement (ECCA)	Any arrangement prior to formal schooling where a child receives care and in/formal education.
Early Child Care Characteristics	The type, quantity and quality of ECCAs.
Early Intervention/ Head Start Programs	A US government initiative to provide care and school readiness for children of low-income families.
Externalising Problems/Externalising Profile	Problems with controlling emotions and behaviour in an externally focused manner. These behaviours may be aggressive, defiant and hostile in nature.
Family Day Care	Care provided by registered educators who deliver education in an approved venue or at their residence.
Formal Child Care Arrangement (FCCA)	Formal care services provided on a commercial basis in out-of-home settings by an organisation or business. These include arrangements such as those mentioned under CBC.
Formal Schooling	Structured education delivered by teachers in primary and secondary school.
Grandparent Care	Care solely, or mostly, provided by the grandparent/s of the child. This care can be provided in the family home or grandparent's home.
Home Based Care	Care solely, or mostly, provided by someone employed to look after typically ≈3-7 children (who are not siblings), either in the child's or another's home.

Informal Child Care Arrangement (ICCA)	Informal care provided by parents, grandparents, relatives or non-relatives, usually in the family home. Includes some fee-for-service arrangements, such as the employment of nannies.
Internalising Problems/ Internalising Profile	Problems with controlling emotions and behaviour in an internally focused manner. These behaviours may be depressive, anxious or withdrawn in nature.
Kindergarten	Primary school foundation year (the year prior to year 1). In NSW, Australia, this is the first year of formal schooling.
Long Day Care	A type of centre-based care that typically operates for eight hours a day. This service is centred around the developmental needs and interests of each child.
Maternal Care	Care solely, or mostly, provided by the mother of the child, usually in the home.
Nanny Care	Care solely, or mostly, provided by someone employed to look after the child in their home.
Paternal Care	Care solely, or mostly, provided by the father of the child, usually in the home.
Preschool Program	Includes services that provide a structured, play-based learning curriculum for children who are a year or two away from commencing full-time schooling, delivered by a degree-qualified teacher.
Psychological Characteristics/ Psychological Profile	Concerning psychological characteristics of behaviour in children that are commonly broken down into internalising and externalising profiles.
Relative Care	Care solely, or mostly, provided by relatives (other than the grandparent or parent) of the child, e.g. aunties and uncles. This care can be provided in the family home or the relatives' home.
Temperament	A child's unique nature which affects their reactivity, adjustment and self-regulation in their given environments.

Abstract

Research has shown that early child care arrangements (ECCAs) can nurture or hinder children's social, emotional and behavioural development. Much of the existing literature has shown contrasting or inconsistent findings. The role played by a child's psychological profile has seldom been explored in the context of ECCAs and child development. The relationship between these elements may provide explanations as to why some children are more or less susceptible to the effects of ECCAs. This quantitative, prospective cohort study explored how different ECCAs affected the outcomes of children with different psychological characteristics. Additionally, it assessed whether psychological profiles and/or ECCAs impacted a child's transition and adjustment to formal schooling.

A review of the existing literature was conducted to synthesise and clarify research examining how ECCAs impact child outcomes. A validation study was also conducted to develop and validate the Home Observation for Measurement of the Environment Inventory-Short Form-Questionnaire (HOME-SF-Q). Parents of 4–6-year-old children in their final year of care prior to formal schooling were then invited to provide information about their child's current functioning three times over a 12-month period.

The validation study demonstrated that the HOME-SF-Q is a valid and reliable measure that can be used in future research studies to assess home environment quality. The cohort study revealed that ECCA type had less effect on the child than their own psychological characteristics. Internalising children continued to have emotional functioning difficulties throughout their ECCA and formal schooling experience. They also experienced social skills deficits while in their ECCA. Externalising children had both behavioural and social functioning difficulties throughout their ECCA and formal schooling experience. Combined children experienced the greatest difficulties of all the study subjects, as they exhibited social, emotional and behavioural functioning deficits throughout their ECCA and

formal schooling experience. In addition, internalising children functioned better in kindergarten emotionally and behaviourally if they had attended formal care but functioned better socially if they had attended informal care.

This study provides new insights into the relationship between ECCAs and children's psychological profiles. The results can be used to support revisions to government policy and improvements to clinical practice guidelines that include recognition of the implications of children's experiences in early care. Specifically, the findings can help to identify the strengths and weaknesses of children attending different types of ECCAs that can then be incorporated into treatment planning for 4–6-year-old children who exhibit internalising and externalising behaviours.

CHAPTER I: INTRODUCTION

SECTION 1

Child Care Arrangements: Background

The impact of a child's early care environment on their developmental trajectory is significant (Ansari & Pianta, 2018; Felfe & Lalive, 2018; McCormick et al., 2020; van Huizen & Plantenga, 2018). Successful early care environments facilitate the attainment of optimal outcomes by nurturing child potential (Britto et al., 2017; De Schipper et al., 2004; NICHD ECCRN, 2002; Ritblatt et al., 2017; Shonkoff, 2017). A body of research has been developed within the context of early care environments in an effort to understand their influence on child development (Bassett et al., 2017; Belsky, 2006; Chess & Thomas, 1999; De Schipper et al., 2004; NICHD ECCRN, 2001a, 2001b, 2002, 2003a, 2003b, 2005b; Pluess & Belsky, 2009, 2010). Some research has shown that attendance at child care centres leads to more optimal child psychological and/or behavioural functioning (Broekhuizen et al., 2018; Gialamas, Mittinty, et al., 2014; Gialamas, Sawyer, et al., 2014). However, other work has shown that child care centres are associated with poorer social, emotional and/or behavioural functioning (Ansari, 2018; Coley et al., 2013; NICHD ECCRN, 2001b, 2005b; Van Beijsterveldt et al., 2005). Thus, it appears that further research is required in order to adequately account for the range of influences on early development that result from engagement in early care environments, and the relative importance of these influences for child social, emotional and behavioural development.

A child's early child care arrangement (ECCA), which is defined in this thesis as the care and in/formal education received by a child prior to entering formal schooling, is one element of the care environment. This thesis will focus specifically on the time period one year prior to formal schooling. The latest Australian data shows a steady increase in children

attending formal care services, from 9% in 1996 to 19% in 2017 (Australian Bureau of Statistics, 2017). By contrast, the traditional parental, grandparental and relative care that parents used to favour has decreased from 31% in 1996 to 19% in 2017 (Australian Bureau of Statistics, 2017; Brady, 2018). Research into policy frameworks suggests that the percentage of children enrolled in child care centres and preschools will continue to grow (Brady, 2018; Craig & Churchill, 2018). This is mainly due to the decreasing financial support offered to parents, which influences their decision to return to work soon after childbirth (Brady, 2018; Craig & Churchill, 2018).

While many aspects influence the type of ECCA that a parent chooses for their child, the role of a child's psychological profile, i.e., their psychological characteristics and traits, has seldom been explored in the context of ECCAs and child development. Research examining the nature of the dynamic interplay between the characteristics of ECCAs and a child's psychological profile is still in its infancy (Bassett et al., 2017; De Schipper et al., 2004; Pluess & Belsky, 2009). The evolution of knowledge about "differential susceptibility", which is a model that proposes how susceptibility traits affect a child's sensitivity to their environment (Belsky, 2013), lends support to the notion that understanding the relationship between ECCAs and a child's psychological profile may be important for providing further insights into children's outcomes during this period before and while transitioning into formal schooling (Arace et al., 2019; Belsky, 2013; Belsky & Pluess, 2012; Hanson-Cook & Richardson, 2020; Linberg et al., 2020). While investigations in this area to date have focused on how ECCAs impact child outcomes, this thesis contributes to the field by exploring how a child's psychological characteristics renders them more or less vulnerable to the effects of ECCAs, and how this interaction between ECCAs and psychological characteristics influences a child's transition and adjustment to formal schooling.

Characteristics of ECCAs include the *type* of care, the amount or *quantity* of time

within the environment, and the *quality* of the care arrangement (Coley et al., 2013; Pluess & Belsky, 2009). Primary literature initially focused on the link between ECCA types and children's outcomes. These types include informal child care arrangements (ICCAs) such as parental (Dillaway & Paré, 2008), nanny (Capizzano, & Adams, 2003), and neighbour or relative care (Susman-Stillman, & Banghart, 2008). It also includes more formal child care arrangements (FCCAs) such as daycare and preschool (Belsky, 2001; Berger, Hill, & Waldfogel, 2005). However, examinations centering on type of care alone failed to consider the structural and relational variables that may also affect outcomes. For this reason, researchers then looked at the relationship between quality of care and children's well-being.

In early research examining the effects of child care quality on children's development, the literature comprised investigations into high-quality care (Vandell, 2004). It was established that effective and high-quality standards included supportive caregiver-child interactions, positive and constructive social interactions between children and their peers, opportunities for stimulation, opportunities for learning, increased child engagement, and supportive and positive environments (Arnold et al., 2006; Lee et al., 2006; Vandell, 2004; Yan et al., 2016). However, the generalisability of these studies was questioned (Belsky & Steinberg, 1978), and thus varying quality standards became the focus. Also at the time, there was a focus on establishing process quality, defined by Vandell (2004) as "the experiences that children have with caregivers, peers, and materials" (p. 391). Assessing quality of care came to be seen as vital due to its important influence on development. For instance, child care quality predicted teacher-reported infant and child behaviour problems and teacher-child conflicts, such that higher quality was associated with fewer behaviour problems and teacher-child conflicts (Pleuss & Blesk, 2009). But the amount of time a child spends in ECCAs has also been shown to moderate the relationship between high-quality ECCAs and children's outcomes (Pluess & Belsky, 2009).

Since attachment to caregivers and the parent-child relationship have been reported as being essential in a child's early life, it seems crucial to understand how varying quantities of time in ECCAs influences development (Belsky, 1986, 1988, 1990, 2001). However, quantity of child care is difficult to assess from the literature, as it is highly correlated and entangled with other factors. These factors include the effects of when care was initiated, maternal characteristics, and attachment (Vandell, 2004). Thus, the amount of time spent in ECCAs is important to consider, given that it affects a child's social, emotional and behavioural outcomes.

Theoretical Framework

Many well-established theories support the premise that young children are fundamentally shaped by the people in their lives and their environmental surroundings. These include the seminal works by Skinner (1937) on *operant conditioning* and by Ainsworth and Bowlby (1991) on *attachment theory*. Among the significant number of theories that help us to understand how early interpersonal and environmental influences shape development, three are particularly important in the context of the present discussion. These are: 1) Ecological Systems Theory, 2) Goodness of Fit Model, and 3) Social Learning Theory. These theories add depth to our understanding of what role ECCAs play in a child's life and how they impact a child's development.

Ecological Systems Theory. This research thesis project is rooted in the work of Bronfenbrenner (1977) and his Ecological Systems Theory (EST). EST is a holistic theory that suggests that humans develop within the context of their environment (Bronfenbrenner, 1977). This theory supports the belief that the system surrounding the person, whether it be social, familial or educational, will impact the person's development and identity (Bronfenbrenner, 1977). EST consists of five subsystems: the microsystem, mesosystem, exosystem, macrosystem and chronosystem (see Figure 1.1; Bronfenbrenner, 1977, 1992,

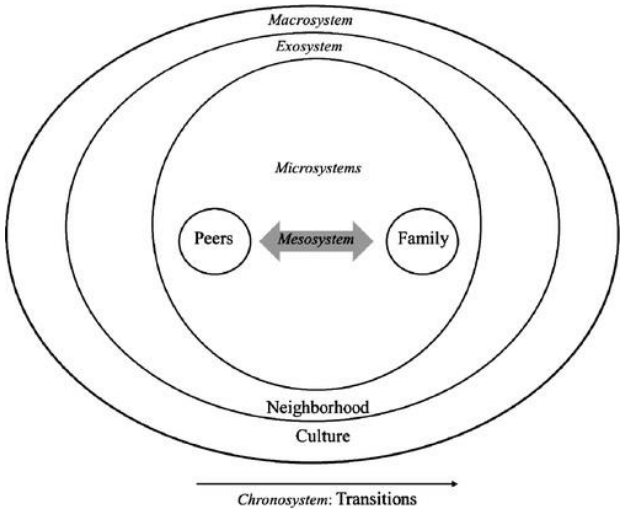
1996; Paat, 2013). The microsystem is the innermost system in a child's life, and includes their immediate surroundings and their relationships within those surroundings, for example, with family members or peer groups (Bronfenbrenner, 1977; Paat, 2013). The next level, the mesosystem, represents connections within important microsystems, such as interactions with peers, family members and school (Bronfenbrenner, 1977; Paat, 2013). The exosystem represents the broader society of a child, which may impact them directly (Bronfenbrenner, 1977; Paat, 2013); it usually includes neighbourhoods and support networks. The macrosystem integrates the societal values, norms, culture and laws that influence the smaller subsystems (Bronfenbrenner, 1977; Paat, 2013). Finally, the chronosystem reflects life changes and transitions over time (Bronfenbrenner, 1977; Paat, 2013). Therefore, as Bronfenbrenner (1977, 1992, 1996) stated, "to understand the child, the environment in which the child lives must be fully examined including the home, school, community, culture, and so on" (Burns et al., 2015, pg. 250).

As implied by EST, the environment and system to which a child is exposed will affect their development and characteristics (Bronfenbrenner, 1977), so it is clear that ECCAs are influential environments for growing children. This theory also reinforces the notion that children's experiences cannot be comprehended without consideration of all the multiple factors that are interconnected, since the subsystems within the EST all interrelate in some form or another. ECCAs and the caregivers who work in these environments are themselves part of a child's microsystem and mesosystem. Given the sheer number of children aged between 4 and 6 in Australia, it is not possible to consider the needs of every individual child (Burns et al., 2015), therefore it is important to examine the system within which these children are being cared for (Burns et al., 2015). This knowledge can potentially inform policy changes relating to ECCAs in a child's macrosystem (Markström & Simonsson, 2017; Persson & Tallberg Broman, 2017; Vlasov & Hujala, 2017; Yngvesson & Garvis, 2019).

EST's multi-layered approach also implies that healthy psychological and behavioural development is achievable when a child's ECCA conforms smoothly with parental and home expectations (Yngvesson & Garvis, 2019). Previous research has also highlighted the importance of parents and teachers establishing a positive relationship to ensure healthy child development (Yngvesson & Garvis, 2019). One study found that when parents are active in their child's preschool experience, preschool teachers see parents as "team members" (Markström & Simonsson, 2017, pg. 187), and this constitutes one important element of bridging the home-preschool divide for a child.

Figure 1.1

Conceptual Framework of Family Ecology Paradigm



Note. Adapted from "Working with Immigrant Children and Their Families: An Application of Bronfenbrenner's Ecological Systems Theory," by Y-F. Paat, 2013, *Journal of Human Behavior in the Social Environment, 23,* p. 955, Copyright 2013 by the Taylor & Francis Group, LLC.

Goodness of Fit Model. Another key theory which this current study draws on is the goodness of fit model (Chess & Thomas, 1999). Chess and Thomas (1999) defined goodness

of fit as occurring when "the properties of the environment and its expectations and demands are in accordance with the organism's capacities, characteristics, and style of behaving" (pg. 3), particularly in children. This model is reciprocal in that the environment must meet the demands of the child's capabilities, but the child also needs to be compatible with the demands of the environment (Chess & Thomas, 1999; De Schipper et al., 2004; Hipson & Séguin, 2017). According to the goodness of fit model, when this "fit" occurs, the child is well adjusted and functions at an optimal level. Therefore, according to this model, the interaction between a child and their environment can influence the child's developmental outcome.

The goodness of fit model can be applied in the context of children's psychological characteristics and ECCA attendance (Chess & Thomas, 1999; De Schipper et al., 2004). In this context, goodness of fit applies to finding harmony between a child's psychological capabilities and vulnerabilities and their ECCA (Chess & Thomas, 1999; De Schipper et al., 2004). Poorness of fit between a child and their ECCA may result in the child displaying internalising and/or externalising problems (Chess & Thomas, 1999; De Schipper et al., 2004; Zeman et al., 2002).

Investigations by numerous researchers of the goodness of fit between ECCAs and children's outcomes have focused on child temperament (Churchill, 2003; De Schipper et al., 2004; Hipson & Séguin, 2016; Vitiello et al., 2012). For example, a study carried out by Hipson and Séguin (2016) reported on how the fit between child temperament and teacher-child relationship quality was related to pro-social behaviour. The findings indicated that child temperament significantly moderated the association between teacher-child relationships and pro-social child behaviour (Hipson & Séguin, 2016). These findings were supported by another study that investigated how temperament was associated with optimal

child behaviour (Vitiello et al., 2012). However, there has been little discussion to date about the goodness of fit between psychological characteristics and ECCAs.

Other studies have focused on the goodness of fit between the child and the ECCA caregiver, or the ECCA caregiver and the parent (Churchill, 2003; Hipson & Séguin, 2016; Silver et al., 2005). When teachers and parents agree on their values and goals, particularly in terms of their expectations of child behaviour, findings have shown higher child competency ratings and test scores (Churchill, 2003). When parents and caregivers have varied degrees of tolerance for children's behaviour (e.g., using high levels of energy outside for a long period of time), their reactions to that behaviour will vary. This then has the potential to affect the ECCA caregiver-child relationship (Churchill, 2003). For example, a caregiver who has an interest in sport may connect well with a child who also enjoys sport (Churchill, 2003). This congruence between the caregiver and child may lead to a more positive and enjoyable experience for the child, which in turn may have positive implications for their well-being (Churchill, 2003; De Schipper et al., 2004). This positive teacher-child relationship may also foster the development of optimal adaptive interpersonal and intrapersonal skills in the child (Hipson & Séguin, 2016; Silver et al., 2005).

Social Learning Theory. Albert Bandura proposed a behavioural theory in the 1970s called Social Learning Theory (Bandura, 1977). This theory states that people learn through direct experience, and more specifically, that learning occurs through observation of others' behaviours (Bandura, 1977; Bandura, 1978). The social behaviour of children was investigated through the well-known bobo doll experiment (Bandura et al., 1961). The results of this experiment showed that when children were exposed to models who were aggressive towards a plastic doll, they, too, would display aggressive behaviours (Bandura et al., 1961). This implies that children express behaviours by imitating behaviours modelled to them by others within their environment. Many social skills interventions, involving the provision of

modelling, reinforcement and feedback, have been influenced by social learning theory (Sheridan et al., 2011).

Based on social learning theory, ECCA caregivers may influence children's social and behavioural functioning through modelling. In particular, FCCA caregivers may adopt different modelling techniques such as the use of stories and puppets to teach concepts and skills (Bierman & Motamedi, 2015). They may also use activities, such as role plays, to help children generalise these skills in their interactions with six to thirty other children in their class (Bierman & Motamedi, 2015). These modelling techniques are more likely to be applied in higher-quality FCCAs and within higher-quality teacher-child relationships. This was supported by one study which examined the quality of child care and its effect on child development (Gialamas, Mittinty, et al., 2014). This found that higher-quality relationships were associated with better academic outcomes and better psychological and behavioural outcomes (Gialamas, Mittinty, et al., 2014).

As the bobo doll experiment demonstrated, aggressive and unhelpful behaviours that are modelled to children are likely to be replicated through social learning (Bandura, 1977; Bandura, 1978; Bandura et al., 1961). There is some evidence that this also applies to depressive symptoms, such that mothers with depressive symptoms may model this behaviour, especially to children with high levels of internalising symptoms (Ahun et al., 2018; Huntley et al., 2017; Zilanawala et al., 2019). If a parent with depression chooses an ICCA rather than a FCCA for their child, there could be implications for a child's behavioural and emotional functioning, based on this learning theory (Ahun et al., 2018; Huntley et al., 2017; Zilanawala et al., 2019). This is also supported by one study that showed that care outside the home can act as a buffer to the effects of maternal depression on child developmental outcomes (Yan et al., 2016).

Theoretical Basis

Children's time is spent in many different environments, such as indoors at home, outdoors, attending schools or ECCAs, and playing sports (Khajehzadeh & Vale, 2017; Loebach & Gilliland, 2016; Mullan, 2019). Children's characteristics are influenced by their interactions within these environments, and by the influences of key caregivers in these environments (Phillips & Shonkoff, 2000; Scarr & McCartney, 1983; Tayler, Cloney, et al., 2016). This is especially true in infancy, toddlerhood and early childhood, as these are critically sensitive periods during which a multitude of social, emotional and behavioural processes are established (Black et al., 2017; Cummins & McMaster, 2006). Numerous developmental changes occur during this period, such as brain development (Coch et al., 2007), impulse control (Gagne, 2017), emotion regulation (Skinner & Zimmer-Gembeck, 2016) and cognitive advancement (Bernier et al., 2015). Additionally, a range of interpersonal and intrapersonal processes are also forming, at the same time as attachments to significant caregivers are established (Dozier & Bernard, 2017), socialisation into different societal groups begins (Halim et al., 2018), values and norms develop (Staples & Bates, 2018), and children internalise parental standards which then establish expectations and consequences of behaviours (Tavassolie et al., 2016). These processes occur over time and across settings.

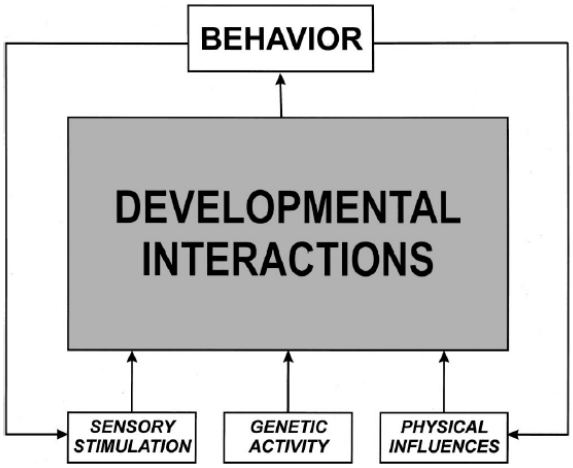
Although children spend a lot of time in ECCAs (Du et al., 2019), there are many other interpersonal and intrapersonal factors that contribute to their development. These factors include genetics, temperament, psychological characteristics, parent-child attachment, parental practices and education (Cummins & McMaster, 2006; Keltner et al., 2014). Although this thesis will focus on ECCAs and psychological characteristics, these other interpersonal and intrapersonal factors were considered in the overall study design and analyses.

Intrapersonal factors.

Genetics. One factor that influences a child's response to their environment is their genetics (Lecompte et al., 2021; Thornberry & Krohn, 2017). Although research has found locations where particular genes appear to influence specific behaviours, research over the past century has focused more on gene-environment interactions, and on understanding how genes interact with other factors to influence behaviours (Clark et al., 2018; Lecompte et al., 2021; Oliver & Plomin, 2007). One demonstration of this is found in a twin study that analysed data from over 12,000 children (Oliver & Plomin, 2007). The researchers found that genes contribute to *similarity* in cognitive performance while environment contributes to *differences* in cognitive performance (Oliver & Plomin, 2007). Furthermore, Johnston and Edwards (2002) developed a model which demonstrates how sensory stimulation, genetic activity and physical influences impact developmental interactions, which then influence behaviour (see Figure 1.2). This developmental model shows that "there can be no genetic effects on behaviour independent of the environment, and it can be added that there are probably no environmental effects on behaviour independent of genetic activity" (Johnston & Edwards, 2002, p. 28). This reciprocal model demonstrates that although genetics may not be entirely responsible for behavioural expression, they play an important role in influencing it. In terms of the connection between ECCAs and genetics, developmentalists have paid attention to how the function of genetics impacts developmental experiences in these environments (Caspi & Moffitt, 2006). They have provided evidence that supports the notion that children who possess particular genes and/or genetic predispositions score higher than other children on behavioural and social problems (Belsky et al., 2007; Belsky & Pluess, 2012; Pluess & Belsky, 2009). Further supporting this connection, the relationship between the Dopamine D4 receptor gene (DRD4) and the quality of child care was examined in one

Figure 1.2

Model of Behavioural Development



Note. Reprinted from "Genes, interactions, and the development of behavior," by T.D. Johnston, & L. Edwards, 2002, *Psychological Review, 109,* p. 27, Copyright 2002 by the American Psychological Association.

study (Belsky & Pluess, 2013), which suggested that the interaction of these factors predicted externalising problems in their child sample at 54 months and in kindergarten, and social problems in kindergarten and first grade (Belsky & Pluess, 2013). This study highlighted the importance of considering both between- and within-child factors such as genetics when assessing the impact of early child care on child outcomes. This gives rise to the question: are children in particular ECCAs experiencing psychological and behavioural dysfunction due to the ECCA itself, or to their genetic predisposition?

Temperament. Similarly, child temperamental characteristics, defined as "individual differences in reactivity and self-regulation" (Rothbart, 1981, p. 569), also influences the development of social, emotional and behavioural processes (Arace et al., 2019; Behrendt et al., 2020; Rothbart & Bates, 2006). Temperamental influences offer the potential to identify patterns of emotional and behavioural responses across individuals (Cummins & McMaster,

2006; El-Sheikh & Erath, 2011; Keltner et al., 2014). Different dimensions of temperament have been defined, including negative emotionality, positive emotionality and effortful control (Rothbart & Bates, 1998). Negative emotionality is associated with traits of fear, irritability, frustration, sadness and anxiety (Blair et al., 2004; Rothbart & Bates, 1998), while positive emotionality is associated with traits such as positive affect, extraversion, energy and confidence (Khazanov & Ruscio, 2016). Effortful control is defined as "proneness toward attentional focusing and/or perceptual sensitivity" (Blair et al., 2004, p. 422).

Investigations into the links between temperament and child outcomes have demonstrated that negative emotionality predicts a higher efficiency in processing social information (LaBounty et al., 2018). Additionally, lower scores of positive emotionality at the age of 3 years are associated with greater helplessness when the child is faced with interpersonal tasks at age 7 years (Hayden et al., 2006). These findings highlight the integral role of temperament in social development; however, as with any other intrapersonal factor, it is important to consider what other factors interact with temperament to affect child outcomes. For instance, although temperament plays a role in the development of problematic behaviours, the ability to cope with emotions, together with constructive coping techniques, have been found to be even more important for pro-social behaviour development (Blair et al., 2004).

Temperament is a possible moderating factor in the relationship between ECCAs and children's outcomes (Behrendt et al., 2020; Crockenberg, 2003; Johnson et al., 2019). One possible reason is that children with negative emotionality may wear the patience of caregivers at ECCAs, making their interactions more strained than with children who possess a positive emotionality temperament (Crockenberg & Leerkes, 2003). These children also tend to become more stressed during long hours of organised ECCAs, experience conflicts with peers and display problematic behaviour (Crockenberg, 2003). Interaction effects

between temperament and parenting, and between temperament and child care quality, also reveal that temperament, along with other factors, may predict child outcomes in ECCAs (Behrendt et al., 2020; Pluess & Belsky, 2010). For example, in one study, the interaction between child care quality and temperament predicted less problematic behaviour, less conflict between child and caregiver, and better reading ability in children with difficult temperaments (Pluess & Belsky, 2010). Meanwhile, the interaction between parenting quality and temperament predicted better scores on all three academic outcomes, as well as on social skills and work habits, in children with temperamental difficulties (Pluess & Belsky, 2010). This suggests that children with difficult temperaments who receive better quality care from their parents or ECCA may be more susceptible to the beneficial effects of ECCAs on child academic, social, and behavioural outcomes.

Psychological characteristics. Psychological characteristics of children's behaviour are commonly divided into internalising and externalising profiles (Achenbach & Ruffle, 2000; Fanti & Henrich, 2010; Thomson et al., 2019). Children with externalising profiles display behaviours that are aggressive, defiant and hostile (Fanti & Henrich, 2010; Rothbaum & Weisz, 1994; Thomson et al., 2019). By contrast, children with internalising profiles display behaviours such as withdrawal, expression of somatic complaints, and anxious and depressive tendencies (Fanti & Henrich, 2010; Thomson et al., 2019). Internalising and externalising problems in children are also found to have a high rate of comorbidity (Willner et al., 2016). Internalising/externalising profiles are known to impact a range of characteristics in children, such as self-esteem (Muris et al., 2003), social functioning, academic functioning (Gresham et al., 1999) and temperament (Oldehinkel et al., 2004).

With approximately 20% of Australian children experiencing internalising and/or externalising symptoms, it is helpful to understand the predictors of these characteristics (Bayer et al., 2012). Previous research has shown that some predictors of internalising

behaviours in children are angry and emotionally distant fathers (Katz & Gottman, 1993), maternal depression (Leve et al., 2005), harsh discipline, single parenthood, maternal stress, being the eldest sibling, and maternal substance misuse (Cummins & McMaster, 2006). Further, a recent meta-analysis of 141 articles found that inter-parental conflict, less warmth, abusive parenting, and over involvement increase the risk of internalising problems in children (Yap & Jorm, 2015). Some predictors of externalising behaviours in children are mutually hostile marital interactions in parents (Katz & Gottman, 1993), male gender, harsh discipline, maternal stress (Bayer et al., 2012), temperament and the family environment (Leve et al., 2005). Authoritative and permissive parenting styles have also been associated with externalising problems in children (for an in-depth meta-analysis see Pinquart, 2017). It is notable that some of the risk factors pertaining to children's internalising and externalising profiles are a direct result of various parental factors. Research has focused on the family setting when identifying some of the key risk factors for childhood internalising and externalising behaviours as parents possess both foresight and inherent motivation to modify factors that may influence their child's development (Yap & Jorm, 2015). Because of this insight, parents are a good target for prevention and early intervention of childhood disorders (Yap & Jorm, 2015). To further this point, recent reviews have found that parenting interventions reduce the risk of internalising problems (Costantini et al., 2020) and externalising problems (Tully & Hunt, 2016) in children. Since internalising/externalising profiles impact children's functioning capacity, it may be important to understand how these factors relate to early care environments (Bayer et al., 2012). Previous researchers have identified a gap in this area, meaning there is a need for further research examining how children's internalising and/or externalising profiles relate to their susceptibility to being influenced by ECCAs (Bassett et al., 2017; Eisenberg, Sadovsky, et al., 2005; Fanti & Henrich, 2010; Pluess & Belsky, 2009, 2010).

To understand the effects of psychological profiles on child outcomes, one study divided its sample into externalisers, internalisers, comorbids and controls based on their parents' and teachers' CBCL and TRF ratings (Eisenberg, Sadovsky, et al., 2005). Externalisers were children who scored in the borderline or clinical range on the externalising subscale of the Teacher Report Form (TRF; Achenbach, 1991) and Child Behaviour Check List (CBCL; Achenbach, 1991). Internalisers were children who scored in the borderline or clinical range on the internalising subscale of the TRF and CBCL. The comorbid group scored in the borderline or clinical range on both the externalising and internalising subscales of the TRF and CBCL, while the control group scored in the normal range on both the externalising and internalising subscales of the TRF and CBCL (Tayler, Cloney, et al., 2016). The study indicated that children classified as internalisers and externalisers were associated with negative emotionality, and also that, compared with the control group, externalisers were low in effortful control and had high impulsivity, while internalisers had low impulsivity (Eisenberg, Sadovsky, et al., 2005).

A study by Bassett et al. (2017) showed how differing levels of surgency in children, defined by Rothbart and Bates (2006) as their approach/withdrawal tendencies in new situations, affected their sensitivity to comments by caregivers at preschool and child care. Their findings indicated that children who were apprehensive and shy were more sensitive and vulnerable to teachers' reactions, comments and socialisation behaviours (Bassett et al., 2017). Thus, it can be inferred that children with internalising tendencies may find the early child care environment anxiety-provoking if they are constantly sensitive to and vigilant towards those in their surroundings. By contrast, children who had high levels of surgency displayed higher levels of social competence and impulsive behaviours, sought higher intensity activities, and were less aware of teachers' behaviours and reactions (Bassett et al., 2017). These findings imply that children who are energised and outgoing may overwhelm

and intimidate those children who are observant, apprehensive and shy, thereby inadvertently reinforcing their anxious behaviour. Additionally, children in preschool who exhibit externalising profiles have been found to be more aggressive, and to attribute hostile intentions to others' neutral behaviours (Coy et al., 2001). This poses an issue for their social functioning as it suggests an inaccuracy in their encoding of social information, which then impacts their appropriate social responding (De Castro, 2004). Despite this, children who presented with externalising profiles displayed more control over their behaviour and emotions within the home when their parents were accepting of, and responsive to, their needs (Rothbaum & Weisz, 1994).

Interpersonal factors.

Attachment. The development of attachment relationships, characterised by Cummings and Cummings (2002, p. 35) as an "affective bond", depends crucially on the quality of the interpersonal and reciprocal processes that nurture human development (Malekpour, 2007). Attachment varies with the quality of those bonds and of the care experienced (Sroufe, 1988). The dynamic nature of attachment has been researched for decades, since Bowlby's early research on attachment theory (Bowlby, 1982b). However, it was not until a model of attachment, the inner working model (IWM), was developed that the long-standing effects of attachment relationships were understood (Bowlby, 1982a; Delius et al., 2008). The IWM demonstrates that when a child interacts with a significant caregiver repeatedly, their organisation of the information processed during these interactions is encrypted as a schema (Delius et al., 2008). When faced with novel situations, the child then processes new experiences through the lens of recalling this schema (Delius et al., 2008). When children have a secure attachment to their parents, they develop IWMs of themselves as worthy of love (Guild et al., 2017). Thus, secure attachments have important implications

for the well-being and development of children who later grow into successful adults (Honig, 2002).

Attachment relationships have been seen to affect young children in early care environments. The quality of early care may also mediate the effects of attachment on development. This was investigated through a study that explored how maternal-child attachment relationships affected psychological characteristics in late childhood (O'Connor et al., 2012). The authors found that insecure attachment relationships at 36 months, assessed through a modified Strange Situation procedure (Cassidy et al., 1992), were associated with externalising and internalising behaviours, measured by the CBCL (Achenbach, 1991) in grade 5. However, the effects of these relationships were mediated through conflict in the teacher-child relationship in early care (O'Connor et al., 2012). It is apparent from this data that although parental attachment can affect a child's internalising/externalising profile, ECCAs and the relationships within these environments are important and able to influence these effects. We can infer from this that ECCA environments should be characterised by features such as sensitivity and responsiveness, which promote healthy, securely attached children. ECCAs, if their attributes were better understood, thus have the potential to influence and even supersede attachment influences on children's mental health and behavioural expression, and a better understanding can help to further knowledge in this area.

Parenting practices. Positive parent-child interactions foster better social, emotional and behavioural outcomes in young children (Morawska et al., 2009). Various factors influence the effectiveness of parenting practices, including socio-economic status and knowledge of child development (Morawska et al., 2009; Stein et al., 2013). Baumrind's (1966) seminal work in this area identified four styles of parenting: authoritarian, authoritative, permissive and neglectful/uninvolved. Briefly, authoritarian parents are highly demanding and controlling; authoritative parents meet children's demands while maintaining

control and affection; permissive parents have little control, make few demands, and engage in little affection and communication; while neglectful/uninvolved parents are similar to permissive parents but rarely show any affection or engage in much communication (Alegre, 2011; Baumrind, 1966). Authoritative parents are arguably the most effective (Kuppens & Ceulemans, 2019), since their children score better than the children of parents with other parenting styles in measures of adjustment and competence (Steinberg et al., 1994), resilience (Kritzas & Grobler, 2005), academic achievement (Boon, 2007), social competence (García et al., 2018; Lamborn et al., 1991) and pro-social behaviour (García et al., 2018; Hastings et al., 2007). This is because these children are monitored and given guidance, while also allowed opportunities to be autonomous. Thus, an authoritative parenting style fosters better outcomes for children.

Parenting styles and family characteristics moderate how ECCAs affect child outcomes. The emotional state of parents, and also maternal depression, have been linked to permissive and neglectful parenting styles, since such parents struggle to make the effort required to parent effectively (Georgiou, 2008; Topham et al., 2010). In one study, maternal depression was shown to predict child psychopathology, greater internalising scores and greater externalising scores (Goodman et al., 2011). Attending a centre-based care facility, in particular, is therefore highly beneficial for children in these situations, since FCCAs have been shown to act as a buffer against the emotional problems associated with maternal depression (Lee et al., 2006). This is because they provide opportunities for children to engage in more positive interactions with peers and other caregivers while their mothers receive some relief from parenting (Lee et al., 2006).

Education. Early child care education encompasses many different factors within these diverse settings which predict children's outcomes. Factors that have been found to influence the impact of ECCAs on children's functioning are: the quality of the care

environment, the emotional support provided within that environment, the room organisation within the care setting, the amount of respect for children's autonomy granted within these settings, and the attachment of children entering early care settings (Colonnesi et al., 2017; Phillips et al., 1987; Tayler, Cloney, et al., 2016). Caregivers within these settings are also influential, as their level of instructional support, work experience, sensitive responsiveness and mind-mindedness impacts the child's experience in the ECCA (Colonnesi et al., 2017; Phillips et al., 1987; Tayler, Cloney, et al., 2016). Optimal ECCAs are those with high-quality care, high levels of emotional support, moderate levels of room organisation and low levels of instructional support, and have caregivers with high levels of work experience, sensitive responsiveness, mind-mindedness and respect for children's autonomy (Colonnesi et al., 2017; Phillips et al., 1987; Tayler, Cloney, et al., 2016).

The Australian Context

ECCAs. In Australia, FCCAs are generally referred to as Early Childhood Education (ECE) services (NSW Government, 2021). The services are rated against a National Quality Standard which assesses seven different areas: educational program and practice, children's health and safety, physical environment, staffing arrangements, relationships with children, collaborative partnerships with families and communities, and governance and leadership (Australian Children's Education and Care Quality Authority, 2018). Three main types of ECE services are recognised in Australia: long day care, preschool and family day care (NSW Government, 2021).

Long day care is generally for children aged 0 to 6 years, and these centres operate hours that suit working families, such as 8am-6pm. Parents can choose to have their child attend all or part of the day. Long day care centres may offer school readiness and school transition programs. Preschools are targeted at children aged 3 to 5 years and operate during NSW school terms, from approximately 9am till 3.30pm. Preschools support early learning

and transition to school. They are mostly community-based and not for profit. Family day care centres are for children aged 0 to 12 and are run by registered educators who deliver education and care either in an approved venue or at their residence. Family day care usually caters for small groups of children (≈7). All other care arrangements, such as maternal care and grandparent care, are recognised as informal care.

Formal Schooling. The process of transitioning into formal schooling varies between countries, as do their educational contexts. For the purposes of this dissertation, we will be referring to Australia's educational system, and, in particular, to primary school education in the state of New South Wales (NSW). The other Australian jurisdictions – Victoria, Western Australia, South Australia, Queensland, Tasmania and the Northern Territory – will not be covered here, as they all have somewhat different systems.

The NSW education system comprises two levels, primary and secondary school. The school year runs from the end of January until mid- to late December, and is divided into four ≈10-week terms. In NSW, it is compulsory for children to be in primary school by their 6th birthday (NSW Government, 1997). In the interest of consistent language, *kindergarten* is a term used here to denote the first year of formal primary school in NSW, in which this project was undertaken.

SECTION 2

Thesis Outline

The thesis is presented in six chapters as follows:

Chapter 1 Introduction: The purpose of this first chapter is to provide the background information, theoretical underpinnings and context for this research, provide the thesis outline, and summarise the project's aims and research questions.

Chapter 2: Review of the Literature. This chapter is a preliminary review of the evidence base investigating the social, emotional and behavioural characteristics of children who attend different ECCAs. The aim was to synthesise and clarify previous research to enhance understanding of the implications of different ECCAs for children's social, emotional and behavioural outcomes; to understand the role that psychological characteristics play in the influence of ECCAs; and to understand the effects that ECCAs and psychological characteristics have on a child's transition and adjustment to school.

Chapter 3 The Home Observation Measurement of Environment Short Form Questionnaire (HOME-SF-Q): A Validation Study. This chapter reports the methodology and results from a validation study that undertook a psychometric evaluation of a new self-report measure, the Home Observation Measurement of Environment Short-Form Questionnaire (HOME-SF-Q). This novel questionnaire aimed to assess the quality of the home environment, mapped against the Home Observation for Measurement of the Environment semi-structured observation tool (HOME; Sugland et al., 1995).

Chapter 4: Methodology. Chapter 4 describes the design and methodology, data management and analysis approach used to address the research questions.

Chapter 5: Results. This chapter presents the key findings from the data.

Chapter 6: Discussion and Conclusion. This final chapter discusses the findings of the study. Limitations and future research are also discussed.

Statement of the Problem

There is limited knowledge of how ECCAs interact with a child's psychological profile to impact social, emotional and behavioural functioning outcomes. This is due to inconsistencies in the results of previous studies that have examined this area. There is also a lack of understanding of how this interaction may influence a child's transition into formal schooling, and or whether there are long-term effects of ECCA and psychological profile

interactions. These research gaps mean that advising parents on future decisions regarding a choice of ECCA for their child is challenging, as current evidence has been unable to determine how to consider a child's unique and individual psychological profile. Clinical psychologists and medical professionals are unable to predict how a child will be impacted by their ECCA, and, consequently, how this will impact their school readiness.

Current evidence has explored the link between ECCAs and outcomes; however, the proposed dissertation project seeks to extend this by incorporating the reciprocal and interaction effects between children's psychological characteristics and their early child care arrangements. In addition, by analysing data collected across three time points, rather than relying on a single point of data collection, this project aims to identify variables predictive of more successful social, emotional and behavioural outcomes for children, especially those who display certain emotional and behavioural characteristics.

Project Purpose and Aims

The purpose of this quantitative, prospective cohort study is to explore how different child care arrangements affect the outcomes of children with different psychological characteristics. Additionally, it aims to assess whether psychological profiles and/or ECCAs impact a child's transition and adjustment to formal schooling.

Research Questions and Hypotheses

The following research questions and hypotheses were addressed by the study:

Q1. What is the effect of different types of early child care arrangements or psychological characteristics on children's social, emotional and behavioural functioning?

> **H1.** Children who attend formal child care arrangements (FCCA) will show better social and emotional outcomes compared to children who attend informal care arrangements (ICCAs).

H2. Children who attend ICCAs will show better behavioural outcomes compared to children who attend FCCAs.

H3. Externalising and combined children will have poorer behavioural outcomes in ECCAs compared to the control group (children who are not identified as internalisers, externalisers, or combined).

H4. Externalising, internalising and combined children will have poorer social outcomes in ECCAs compared to the control group (children who are not identified as internalisers, externalisers, or combined).

H5. Internalising and combined children will have poorer emotional outcomes in ECCAs compared to the control group (children who are not identified as internalisers, externalisers, or combined).

Q2. Does ECCA quality influence the effects of ECCAs or psychological characteristics on children's social, emotional and behavioural functioning?

H6. If a child's FCCA is of high quality, then the child will display better social, emotional and behavioural functioning, compared to when the child's FCCA is of low quality.

Q3. Does home environment quality influence the effects of ECCAs or psychological characteristics on children's social, emotional and behavioural functioning?

H7. If a child's home environment is of high quality, then the child will display better social, emotional and behavioural functioning compared to when a child's home environment is of low quality.

Q4. Does the quantity of time spent in formal care arrangements impact a child's social, emotional and behavioural functioning when they are transitioning and adjusting to formal schooling?

H8. Children who attend higher quantities of FCCAs (>31 hours a week) will display poorer social, emotional and behavioural functioning, compared to children who attend lower quantities of FCCAs (<21 hours per week).

Q5. How is a child's social, emotional and behavioural functioning influenced by prior ECCA engagement and/or psychological characteristics during the transitional phase into formal schooling?

H9. Internalising and externalising children who attended ICCAs will display better emotional and behavioural functioning when entering kindergarten compared to internalising and externalising children who attended FCCAs.

H10. Internalising and externalising children who attended FCCAs will display better social functioning when entering kindergarten compared to internalising and externalising children who attended ICCAs.

Q6. How is a child's social, emotional and behavioural functioning influenced by prior ECCA engagement and/or psychological characteristics beyond the transitional phase i.e., the adjustment phase, into formal schooling?

H11. Internalising and externalising children who attended FCCAs will display better social functioning when adjusting to kindergarten compared to internalising and externalising children who attended ICCAs.

H12. Internalising and externalising children who attended ICCAs will display better emotional and behavioural functioning when adjusting to kindergarten compared to internalising and externalising children who attended FCCAs.

Q7. Is there a correlation between disruptions due to the pandemic (i.e., home, work, school) and a child's social, emotional and behavioural outcomes at school?

H13. Parents who believed that there were greater home, work and school disruptions, due to the COVID-19 pandemic, would rate their children's

social, emotional and behavioural functioning as poorer compared to parents who did not feel that there were many disruptions in these areas.

Significance of the Project

This research has the potential to generate new knowledge about internalising and externalising children and how they engage with specific child care arrangements prior to entering formal schooling, by obtaining data that will help to address the identified research gaps. This research may also offer insights into the psychological and behavioural outcomes of children who attend different forms of care, and their developmental preparedness for engaging in formal education. Further, this research will inform our understanding of school readiness based on child gender, family SES, child social, emotional and behavioural functioning, parenting and care characteristics.

This research will focus on examining how a child's individual psychological profile interacts with their ECCAs to produce different developmental outcomes. That is, unlike previous research, it will adopt a reciprocal model of how psychological profiles interact with ECCAs in order to examine how particular psychological capabilities are influenced by the early care environment attended by a child and vice versa. It is hoped that early child care teachers can utilise this improved knowledge to be better equipped to support the individual young people they are tasked with educating and caring for.

It is envisaged that improving understandings of how ECCAs influence children's psychological and behavioural functioning will provide parents, teachers, caregivers and clinical psychologists with important information on which aspects of a child's early care environment are most influential, and most likely to be most advantageous for the child, given their own unique psychological and behavioural profile. It is anticipated that this research will assist educators, clinical psychologists and parents alike in the crucial task of giving optimal support to young children during their critical formative years, by encouraging

vulnerable children to thrive in whichever environment they receive early care. Indeed, further research that identifies the strengths and relative challenges of different ECCAs could also inform national programs that could be implemented to promote the developing social, emotional and behavioural health of children during a key developmental period.

CHAPTER II: REVIEW OF THE LITERATURE

One of the most important determinants of a child's development is their experience of early care (Black et al., 2017). Early care encompasses all settings in which care and education are received before a child enters formal schooling (Burger, 2010). It has been widely established that studying children in early child care arrangements (ECCAs) can provide valuable information on their likely later developmental outcomes and degree of school readiness (Ansari, 2018; Coley et al., 2013; Coplan et al., 2010; Gialamas, Mittinty, et al., 2014; Gialamas, Sawyer, et al., 2014; Van Beijsterveldt et al., 2005; Votruba-Drzal et al., 2015). Arguably, the most extensive literature in this area focuses on the relationship between ECCAs and later academic functioning (Ansari & Pianta, 2018; Cortázar, 2015; Lehrl et al., 2016; McCoy et al., 2017; Narea et al., 2020; Vandell et al., 2016). For many educational and developmental researchers, this information is invaluable as it helps to predict how a child may transition into formal schooling (McCoy et al., 2017). In recent years, though, it has been established that psychological and behavioural variables are just as important as academic variables in predicting a child's successful transition into school (Davies et al., 2016; Eisenberg et al., 2010; Hunter et al., 2018; Mann et al., 2017). However, the effects of ECCAs on children's psychological and behavioural functioning are unclear as much of the research is inconclusive. Moreover, a small quantity of research has begun to emerge which has highlighted how a child's psychological characteristics may further moderate the relationship between ECCAs and outcomes.

This chapter aims to synthesise and clarify this research. It will achieve this in three ways. Firstly, by synthesising the literature on the implications of different ECCAs for children's social, emotional and behavioural outcomes; secondly, by discussing the role that psychological characteristics play in the influence of ECCAs; and thirdly, by reviewing the

effects that ECCAs and psychological characteristics have on a child's transition to school. Gaps in the existing research will also be identified.

Early Child Care Arrangements (ECCAs)

Classifications of ECCAs. One of the main challenges in the evidence is the high degree of variability in the way ECCAs are defined and classified. For example, in some studies, paternal care is placed in the same category as maternal care when researchers are assessing how parental care differs from other ECCAs (Van Beijsterveldt et al., 2005; Votruba-Drzal et al., 2015), while in other studies, paternal care is separated from maternal care and categorised with centre care (NICHD ECCRN, 2001b). This assumes that the characteristics of and opportunities provided by paternal care and centre care are similar, which may not be the case. Further demonstrating the complications of interpreting these results, two studies may both report that they are assessing parental versus non-parental care, yet what the researchers include in these categories may be quite different (Van Beijsterveldt et al., 2005; Votruba-Drzal et al., 2015). For instance, Van Beijsterveldt et al. (2005) defined non-parental care as care in centres, grandparent care outside the home, home-based care outside the home, and relative (other than grandparent) care outside the home, whereas Votruba-Drzal et al. (2015) defined non-parental care as care in a Head Start program, centre-based care and home-based care. Not only do these differences in definitions and classifications pose a problem for interpretation, but these studies were conducted in a range of contexts, with different models, cultures, geographical considerations and funding arrangements, which also contributes to the lack of clarity and the heterogeneity.

Nevertheless, eight different types of care arrangements have been identified. These can be grouped into two broad categories: Formal Child Care Arrangements (FCCAs) and Informal Child Care Arrangements (ICCAs). FCCAs can be defined as formal services provided on a commercial basis in out-of-home settings by an organisation or business.

ICCAs can be defined as informal care provided by parents, grandparents, relatives or non-relatives, usually in the family home. For the purposes of this discussion, ICCAs may also be characterised as fee-for-service arrangements, such as when nannies are employed, and they differ from FCCAs in that the service provision is home-based. This is an important distinction because children may present differently in settings within and outside the home. One hypothesis is that children may be more comfortable in the familiar surroundings of the family home, and in the company of consistent caregivers, without the pressure of having to compete for attention and possessions with other children (Pesowski & Friedman, 2018).

Two distinct types of FCCAs can be identified in the literature. These are centre-based care (CBC) and early intervention programs that run within CBC. CBC takes multiple forms, such as day care, family day care, long day care, preschool, pre-kindergarten class and nursery care. CBC programs are similar in that they are certified, legislated and structured, with educated staff providing early care and educational services to families. While some early intervention programs, such as the US's Head Start programs, are public health initiatives that provide services to low-SES or disadvantaged families, CBC functions on a fee-for-service basis. This is important to consider as funding has been related to quality of care, and it also has an impact on child outcomes, with better-funded care found to be of higher quality (Fuller et al., 2003).

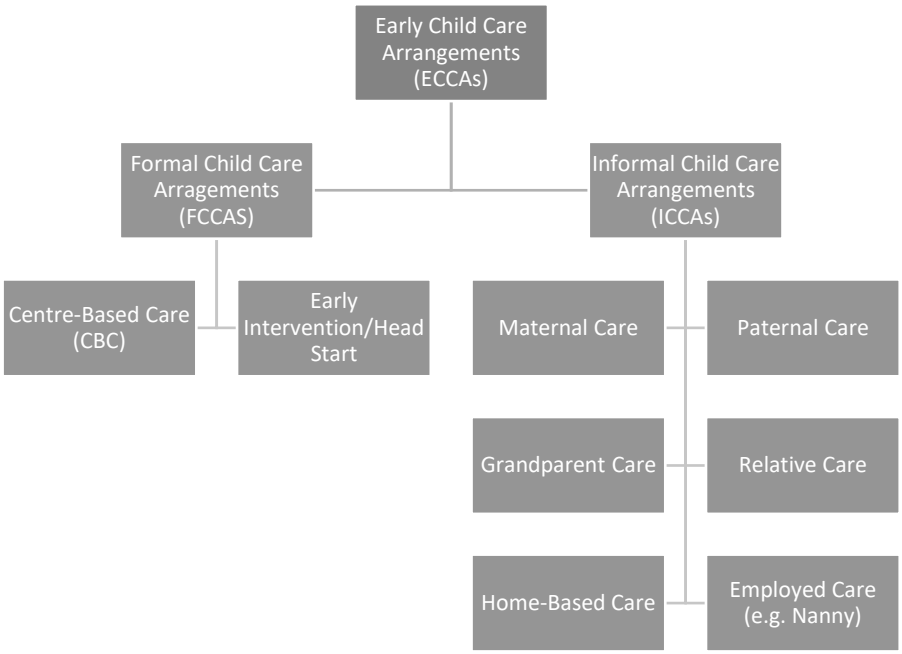
Six types of ICCAs have been identified. These are maternal, paternal, grandparent, relative, home-based and employed care, with most of the latter provided by a child's relative. There are many variations of home-based care arrangements, but they commonly involve care provided to unrelated children by a carer in their own home, certification of the provider, and a fee-for-service or quid pro quo arrangement. Nanny care is care provided by a person who is employed, or enabled through an arrangement, to look after a child/children from the same household in their own home. These types of ICCAs are similar in that they are usually

non-structured, non-legislated and provided by relatives or non-relatives.

Future research would benefit from the use of definitions and methodologies that are standardised and can be used across contexts. This would enable more accurate and meaningful comparisons to be made between, for example, ICCAs and FCCAs. Figure 2.1 outlines these categorical definitions and relationships.

Figure 2.1

Early Child Care Arrangement Categories



Large Scale Studies

In the last decade, researchers have attempted to shed light on how different ECCAs affect children's outcomes (Bratsch-Hines et al., 2015; D'Onise et al., 2010; Huston et al., 2015; Zachrisson et al., 2013). However, debates continue in the literature due to the contrasting findings, meaning that the relationship between ECCAs and outcomes remains unclear. In an effort to better understand this relationship and clarify some of the

inconsistencies, numerous longitudinal cohort studies have been conducted over the past two decades, including the National Head Start Impact Study (Puma et al., 2005), the National Longitudinal Survey of Children and Youth (Sprott et al., 2000), and the Early Childhood Longitudinal Study (Andreassen & Fletcher, 2007). Three other well-known cohort studies that have explored children's experiences in child care are particularly relevant to the context of the current dissertation and will be discussed. These studies are: 1) National Institute of Child Health and Human Development (NICHD) Study of Early Child Care and Youth Development (SECCYD), 2) Effective Early Educational Experiences (E4Kids), and 3) Growing Up in Australia: The Longitudinal Study of Australian Children (LSAC).

National Institute of Child Health and Human Development (NICHD) Study of Early Child Care and Youth Development (SECCYD). Perhaps one of the best-known longitudinal studies is the NICHD SECCYD, conducted in the US between 1991-2009 on over 1300 children, to examine how their experiences in child care affected their well-being and development (NICHD ECCRN, 2001a, 2001b, 2002, 2003a, 2003b, 2005a, 2005b). The findings have contributed significant insights into the relationships between child care experiences, child care characteristics, children's developmental outcomes and their adjustment to formal schooling. However, inadvertently, this study has also produced some inconsistent data (Lee et al., 2006; McCartney et al., 2010; NICHD ECCRN, 2001a, 2001b, 2002, 2003a, 2003b, 2005b; Pluess & Belsky, 2009). For example, one of the studies in the series concluded that more time spent in centre-based care in the first 4.5 years of life led to more behavioural problems in kindergarten (NICHD ECCRN, 2003b), whereas another NICHD study found that more time in centre-based care led to fewer behavioural problems in kindergarten and grade 3 (NICHD ECCRN, 2005b). Additionally, although the NICHD SECCYD study was one of the most comprehensive of its time, children in the study were in preschool between 1995-1999 and thus the results may no longer be reflective of society and

policies today (NICHD ECCRN, 2005a). The methodology of this large-scale longitudinal study was well considered and thorough, measuring the type, quantity and quality of children's ECCAs at multiple time points. However, although this study took into consideration family demographics and parenting quality, a finding such as the relationship between time spent in non-maternal child care and indicators of poor adjustment "remains empirically uncertain" (Belsky, 2006, pg. 105). This may be because this study's emphasis was on child care experiences, rather than on the "goodness of fit" (Chess & Thomas, 1999) between a child's psychological characteristics and their ECCA.

Effective Early Educational Experiences (E4Kids). Another large-scale longitudinal study, E4Kids, was conducted in Australia on 2651 3–8-year-old children between 2010-2015. This study aimed to examine the influence of participation in ECCA programs on children's learning and development (Tayler, Thorpe, et al., 2016). E4kids contributed a significant body of literature to our understanding of the effectiveness of early education and care for a child's academic and social development. The main focus of this work was early child care quality and programs, although some researchers have attempted to use the E4kids dataset to contribute to the under-developed literature on how risk factors are associated with child outcomes (Niklas et al., 2017). These attempts have primarily focused on familial factors such as SES, house security (Niklas et al., 2017) and adversity (Blewitt et al., 2021). For example, one study found that parental mental health, child disability and difficult temperament were correlated with problematic behaviour (Niklas et al., 2017). While this insight was helpful, it lacked information on how psychological profiles combined with ECCA characteristics and child and family factors influence children's social, emotional and behavioural functioning (Tayler, Thorpe, et al., 2016). Thus, a gap in the literature remains.

Growing Up in Australia: The Longitudinal Study of Australian Children (LSAC). The LSAC is an influential longitudinal study of two cohorts from around Australia

that commenced in 2003. It consists of 10,000 children, 5000 in each cohort, aged 0 to 1 years in the B-cohort and 4 to 5 years in the K-cohort. This study is ongoing, with the latest data collected in June 2021; at that time, the B-cohort was aged 16-18 years and the K-cohort 20-22 years.

Although the cohorts are mostly representative of the population at the time, there are some notable differences between the LSAC's sample characteristics and the census distribution. In addition, family characteristics in 2003-2009 were somewhat different from now. The first annual LSAC report in 2004 noted that children whose mothers had completed year 12 were over-represented, while children in single-parent families were under-represented, children with two or more siblings were under-represented, only children were over-represented in the B-cohort, children from low-income families were under-represented, and children from New South Wales were under-represented (Australian Institute of Family Studies, 2005). These differ from current societal trends which reflect an increase in single-parent families (Australian Bureau of Statistics, 2020; Qu & Weston, 2013), an increase in parental education (to bachelor degree level and above), and a norm of approximately two children per family (Australian Bureau of Statistics, 2016).

Although a major strength of the LSAC study was its collection of data on many aspects of children's lives, there are bound to be some weaknesses in a comprehensive data collection study such as this. It has been noted that "measures used in LSAC are often subsets of items from existing tools, and should be regarded as having been largely purpose designed for the study" (Zubrick et al., 2014, pg. 1). Additionally, parenting and early care practices are developmentally- and time-sensitive (Zubrick et al., 2014). This is not to detract from the reliable and valid measures used by the LSAC to assess the different child and family constructs; however, from an analytical perspective, caution should be deployed when using

data from measures that were relevant at the time the data were collected to draw conclusions about children who are now in that developmental period more than a decade later.

Using Secondary Data Analyses for New Research Questions. It is important to acknowledge the positives and challenges of using a secondary dataset to answer new research questions. The positives include promotion of the replication of analyses, researchers' ability to test hypotheses without needing to find new resources and funding, the availability of large sample sizes, and the encouragement of a diversity of opinions (Friedman, 2007; National Institutes of Health, 2003; Weston et al., 2019). The challenges include that not all constructs needed for the new research question are measured, data collection time points may not fit the new research questions, and understanding in the field is based on few population samples (Friedman, 2007; National Institutes of Health, 2003; Weston et al., 2019).

Notwithstanding all of this, there remains value in original research that is designed for and executed in a novel population in order to answer specific research questions. Additionally, although the three large-scale studies just discussed have contributed useful information on ECCAs, family and child characteristics and school transition, the analysis resulting from these longitudinal studies does not offer insights on how a child's psychological profile interacts with their ECCA to inform child outcomes and school transition. Therefore, there is a need to address these research gaps through novel longitudinal studies, conducted as recently as possible on a representative population and with multiple informants, that assess all three characteristics of ECCAs and a child's psychological profile to determine their influence on child outcomes.

ECCAs and Social Functioning

The ability to communicate successfully and appropriately is a crucial tool developed in early childhood. Social functioning is operationalised as a child's ability to use their

interpersonal skills and relationships to interact with their environment (Bosc, 2000; Lillvist et al., 2009). There have been many investigations into the question of whether FCCAs or ICCAs are more advantageous for the development of children's social skills. One line of evidence suggests that FCCAs are associated with increases in social acumen, since they may provide a place to utilise and practice social skills (Côté et al., 2007; Gormley Jr et al., 2011; Huston et al., 2015; Stein et al., 2013). In FCCAs, children are constantly moving between small and larger group play during which the nuances of social interaction are learnt and reinforced (Smidt, 2010). One study's results supported this notion, showing that children in FCCAs displayed better social skills than those looked after by grandparents or childminders (Stein et al., 2013). This could be due to a degree of social orientation that can only be achieved by interacting with multiple peers regularly. However, it is notable that, in this particular study, a higher proportion of FCCA quality was observed compared with the care provided by grandparents and childminders, which may have lent bias to this result. Another study that supported these findings suggested that some children in parental care are apprehensive about socialising in primary school due to the novelty of the environment (Miller & Coll, 2007). However, it is acknowledged that the effects of non-parental and parental care on social functioning vary depending on the environmental context and the people caring for the child within these environments (Waldfogel, 2006).

By contrast, in other studies, children who spend large amounts of time in FCCAs, or who attend low-quality centres, have been found to present with undesirable social outcomes (Ansari, 2018). This finding could be linked to numerous factors such as structural variables within the child care setting, like ratio and group size, or caregiver training (Howes et al., 1992; Rudasill et al., 2016). When these factors are not ideal, children find themselves unable to resolve social issues due to an absence of positive teacher-child relationships and a clash of personality and temperaments (Rudasill et al., 2016). Another common issue is the

inconsistencies in the information provided by the informant reporting these outcomes. The differences in social functioning reported by caregivers and unbiased observers are one example of this. In one study, caregivers reported that children who spent more time in FCCAs had lower social abilities; however, unbiased observers reported an increase in social abilities among children who spent more time in centre care (NICHD ECCRN, 2001a). This discrepancy may often arise because parents with one or two children are not able to observe a whole class of children in the manner of unbiased observers (Doyle et al., 2010). Therefore, their frame of reference for and knowledge of what is normative will differ from those of an unbiased observer (for a meta-analysis on parent-teacher agreement see Carneiro et al., 2020).

Another consideration is that children who attend centre-based care and children solely in parental care have been found to display similar levels of social maturity (Currier & Schmith, 1984; Nomaguchi, 2006), with exposure to child care being unrelated to children's social behaviour with unfamiliar peers (Almas et al., 2011). This poses the possibility that the social abilities demonstrated by study participants may reflect a developmental milestone rather than being directly influenced by their ECCA (Côté et al., 2007; Howes et al., 1992; McCutcheon & Calhoun, 1976). However, these results may be due to confounding factors, such as caregivers' sensitivity, which could not be controlled for in one study because it analysed secondary data (Nomaguchi, 2006). Other studies that have assessed the developmental impact of maternal care, compared with non-maternal care, found that maternal care offered little evidence of a *change* in social development (Baker & Milligan, 2010). However, with this study's sample comprising children of only up to 12 months old, it was limited in its ability to understand the developmental impacts of the care arrangement in later years. There has also been an increase in research measuring other ECCA characteristics which has sought to explain this ambiguous relationship, but it has, unfortunately, not

delivered any more clarity. Some have found that the quality of ECCAs, rather than their type, predicts children's social functioning (Pluess & Belsky, 2009), whereas others have found a non-significant relationship between quality of ECCAs and social functioning (Keys et al., 2013).

In sum, the relationship between ECCAs and social functioning remains unclear (Broekhuizen et al., 2018) and other explanations for these inconsistent results need to be explored, since it would appear that each child responds to their early care environment differently. Nevertheless, based on the current literature, it may be that a favourable mix of attending a high-quality group care setting for relatively low quantities of time is associated with increases in social competencies.

ECCAs and Emotional Functioning

Emotional functioning is essential for the regulation and expression of emotions (Suveg et al., 2007). Emotional functioning is typically assessed through measures of internalising symptoms and behaviours. Internalising presentations are characterised by withdrawn and anxious behaviours (Goodwin et al., 2004). Internalising psychopathology is associated with disorders such as Generalised Anxiety Disorder and Major Depressive Disorder (for a comprehensive review of internalising disorders in early childhood see Tandon et al., 2009).

Centre-based care has been shown to act as a buffer against emotional problems associated with adversity, such as parental depression or low SES (Yan et al., 2016). However, this relationship tends to be influenced by parental functioning and mental health (Johnson & Flake, 2007). For example, infants of depressed mothers have been shown to display higher levels of affective problems (Goelman et al., 2014; Tronick & Reck, 2009). This was illustrated in a key study that showed that children whose mothers were diagnosed with depression had lower emotional abilities than children whose mothers had no mental

health diagnoses (Feldman et al., 2009). It has been suggested that many symptoms of depression, such as a lower rate of eye contact and responsiveness, and a higher rate of anger expression and negative affect, would be prominent in the mother-infant dyad interaction in this study's sample (Tronick & Reck, 2009). However, when at-risk children attended a high-quality FCCA, they displayed fewer overall problems than at-risk children in low-quality FCCAs (Goelman et al., 2014). Although these findings are promising as they indicate that centre-based care serves as a protective influence on at-risk children, it is unclear whether the positive impacts of attending a child care centre extend to children with more nurturing parents and home environments. It can be inferred from these findings that children in parental care would flourish with well-adjusted parents but would display compromised emotional functioning with poor parental well-being. It is also known from other parenting literature that children who are cared for at home by warm and positive parents show more emotion-related self-control (Eisenberg, Zhou, et al., 2005).

In previous studies, positive socio-emotional functioning has been observed when a child was cared for by a relative, friend or nanny, rather than in centre-based care (Harrison, 2008). One hypothesis for an increase in internalising behaviours observed in children in FCCAs as compared with ICCAs (Côté et al., 2008) is that those attending FCCAs from an early age may move around and experience low stability and continuity, which then impacts their healthy emotional regulation (Côté et al., 2008). This may be particularly true of children who already have low resilience, poor self-concept and a high experience of negative emotions (Beijers et al., 2013; Côté et al., 2008; Thompson et al., 2013). This experience of instability may also increase cortisol production, which in turn increases heart rate, blood pressure and anxious, vigilant behaviour (Gunnar et al., 2011). However, this hypothesis does not explain why children in stable FCCAs have also been found to exhibit more internalising behaviours, such as insecurity and anxiety, than children in parental care (Broekhuizen et al.,

2018; Côté et al., 2008). Perhaps a child's psychological characteristics may play a role, as others have found a relationship between FCCAs and internalising problems only in children with poor self-concept (Beijers et al., 2013).

ECCAs and Behavioural Functioning

Behavioural functioning is essential for the regulation and expression of behaviours (Bayer et al., 2012; Rothbaum & Weisz, 1994). It is typically assessed through measures of externalising symptoms and behaviours, which are characterised by aggressive, oppositional and defiant behaviours (Bayer et al., 2012). Externalising psychopathology is commonly seen in disorders such as Oppositional Defiant Disorder, Attention Deficit Hyperactivity Disorder and Conduct Disorder (Riise et al., 2020). As with social and emotional functioning, the impact of ECCAs on children's behaviour is not clear-cut.

Much of the current research evaluating the relationship between ECCAs and behavioural functioning focuses on the negative impacts of large quantities of time spent in FCCAs on children's behaviour. This may be because children who attend FCCAs are reported as being more likely to experience behavioural problems, including aggression and hyperactivity (Beijers et al., 2013; Coley et al., 2013; NICHD ECCRN, 2005b; Spivak & Farran, 2016; Stein et al., 2013). For example, one study found that 4-year-olds in full-time centre care were rated by teachers and parents as higher on externalising measures than children who were solely in parental care (Coley et al., 2013). Meanwhile, another study found that children who spent large quantities of time in centre care (more than 25 hours per week) were rated with greater externalising problems than children with smaller quantities of centre care (NICHD ECCRN, 2005b). These effects may be linked to evidence that children who are separated from their parents show an increase in cortisol production, which has been demonstrated to have associations with externalising behaviour (Colonnesi et al., 2011; Gunnar et al., 2011). Other researchers have suggested that these effects may be due to a

child's temperament and inhibitory control, as this negative association between quantity of time in FCCAs and behavioural problems was only seen in children with negative affectivity, which is characterised by sadness, fear and distress (Beijers et al., 2013).

The beneficial effects of group care settings have also been explored. The premise behind this potential relationship is that children in group care may display more positive behaviours because of the clear expectations and rules that are common in high-quality child care environments. This was demonstrated in a study that found that parents of children who regularly attended centre-based care rated them as having fewer behaviour problems, compared with parents of children who did not attend group care (Harrison, 2008). Additionally, children who spend more time in home-based care have been found to have better behavioural outcomes than children who are solely in parental care (Coplan et al., 2010). However, again it should be noted that that each child responds to their environment differently, so two children attending the same FCCA may display different behavioural expressions. It is important to consider that although many children thrive in the structure and routine of formal group care settings, following instructions and controlling impulses are difficult for children who have self-regulation and externalising problems (Sezgin & Demiriz, 2019).

The relationship between ECCAs and behavioural functioning tends to be contingent on several factors, including the child's age, the number of hours spent in child care, and the identity of the informant reporting on this relationship (Coley et al., 2013; NICHD ECCRN, 2001a, 2001b, 2003b, 2005b; Stein et al., 2013). In one study, it was found that although children with low (2.1 days per week) and medium (2.4 days per week) levels of centre-based care showed higher behavioural and emotional problems than those solely in parental care (Van Beijsterveldt et al., 2005), children who spent long periods (3.5 days per week) in centre-based care did not display more problematic behaviour (Van Beijsterveldt et al.,

2005). This may suggest that when a child is constantly moving between care arrangements, they become lost in the expectations placed upon them by the different environments. However, when they attend one ECCA for a majority of their time, they adapt and behave as expected of them in that particular environment. However, other variables have been shown to account for the relationship between time spent in care and behavioural problems, such as the identity of the informant reporting on child behaviour and the age of the child. For example, some studies show that parents, but not teachers, rate children with lower externalising scores when they spend large amounts of time in centre-based care (Votruba-Drzal et al., 2015), and that more time in centre-based care predicts problematic behaviours in children aged 24 and 54 months but is not associated with such behaviours at 36 months old (NICHD ECCRN, 2001b). It also remains unclear whether children display more aggression as a result of centre-based care, or whether parents of children exhibiting externalising behaviours are more likely to place them in centre-based care due to the challenges of looking after them (NICHD ECCRN, 2003b). As a result, there is a need to focus on other factors that may be causing this heterogeneity.

One potential reason why studies produce these contrasting results is that they fail to consider all contributing factors. In other words, the methodological limitation inherent in not examining all ECCA characteristics, including the type, quality and quantity of that arrangement, inhibits direct comparison of the influence of ECCAs on children's acquisition of social, emotional and behavioural regulation skills. These three characteristics are documented as important, as they can either foster or hinder successful psychological and behavioural adjustment (Huston et al., 2015; Phillips & Lowenstein, 2011); however, not all studies have comprehensively considered all these factors.

ECCAs and Psychological Characteristics

Psychological characteristics are commonly researched under two major hypernyms: internalising and externalising profiles. Internalising and externalising profiles capture different dimensions of social, emotional, and behavioural wellbeing (Bayer et al., 2012). Classifications such as anxious, withdrawn and depressed fall under internalising characteristics, whereas aggression, hyperactivity and defiance fall under externalising characteristics (Bayer et al., 2012; Goodwin et al., 2004). When certain social, emotional, and behavioural patterns occur, and to a significant level, it is commonly captured under one of these psychological characteristic profiles (Bayer et al., 2012). For example, a child with an internalising profile may be shy in social situations, may cry or appear nervous as a typical emotional response, and behave in a way where they withdraw (Achenbach & Ruffle, 2000). Whereas, a child with an externalising profile may get into fights when in social situations, may swear as a typical emotional response, and may commonly behave in a defiant or oppositional way (Achenbach & Ruffle, 2000). While research into the interaction effects of ECCAs and psychological characteristics on children's developmental outcomes is still in its infancy, four seminal studies conducted in the past 20 years have addressed this issue and will be discussed.

Firstly, a child's psychological state was emphasised as being central to their functioning in work by Coplan et al. (2010). They found that child outcomes following attendance at any ECCA were strongly influenced by a child's prior psychological functioning (Coplan et al., 2010). Coplan and colleagues (2010) assessed children through a Canadian version of the Child Behaviour Checklist (Achenbach & Edelbrock, 1981) and classified them into one of four risk groups: anxious, aggressive, comorbid or control. Additionally, children were classified into one of four types of care group: no care (e.g. parental), centre-based care, other care (e.g. nanny/relative care) and home-based care (e.g.

non-relative care in caregiver's home). The results showed that there was a main effect of risk group but not care group (Coplan et al., 2010). Within the risk groups, children in the aggressive category were more aggressive than anxious children two years later, and anxious and comorbid children were more anxious than aggressive children two years later (Coplan et al., 2010). There was also evidence of interaction effects between anxious children and ECCAs, but not between aggressive children and ECCAs (Coplan et al., 2010). The authors found that anxious children who were placed in home-based care experienced less anxiety two years later than anxious children who had attended centre-based care or who had not experienced non-parental care (Coplan et al., 2010). They also found that children in the aggressive category were more anxious in no-care than in home-based care, other care or centre care (Coplan et al., 2010). While this study, one of the first to discuss the role that child care has on the development of anxiety, produced some valuable information, the data were collected in the 1990s and the limitations of this have already been discussed. The authors also suggested that further research was needed in this area to investigate the role played by parenting and family factors in the relationship between ECCAs and psychological profiles (Coplan et al., 2010).

The effects of FCCAs on emotional development are most likely to be mixed, interactive and dependent on the characteristics of the child and the FCCA. This was demonstrated in a study by Pluess and Belsky (2009), who grouped their sample according to the child's temperament. They found that the type and amount of ECCA did not interact with negative emotionality to predict outcomes (Pluess & Belsky, 2009). They also found that the quality of FCCAs did not affect children with low negative emotionality (Pluess & Belsky, 2009). However, children with high negative emotionality displayed behavioural and social problems when attending a low-quality FCCA, and greater social abilities and fewer behaviour problems when attending a high-quality FCCA (Pluess & Belsky, 2009). The

findings emphasise the need for more research in this area, as they suggest that more vulnerable children are more susceptible to ECCA quality. However, since this particular study was limited to the susceptibility of children with differing temperaments (Pluess & Belsky, 2009), the current literature would benefit from research that also considers children's psychological profiles.

Bassett et al. (2017) examined how children's levels of surgency affect their sensitivity to environmental characteristics in ECCAs. For instance, children identified as apprehensive were more sensitive to teachers' reactions and comments. The study also found that children with high levels of surgency displayed higher levels of social competence and impulsive behaviours, and were less aware of teachers' behaviours and reactions (Bassett et al., 2017). This study made a unique contribution to the literature as it highlighted the role that caregivers and teachers play in child social-emotional development. However, it only examined overt expressions of emotion-regulated behaviours, with covert emotions not considered since they were not coded. Thus, conclusions on how caregivers and teachers impact internalising children cannot be drawn from this study. This is a key gap in the literature, indicating the importance of considering both externalising and internalising behaviours.

De Schipper et al. (2004) applied the concept of "goodness of fit" (Chess & Thomas, 1999) in relation to a child's temperament, operationalised as reactivity, adaptability and behavioural style, and their ECCA. They found that children with difficult temperaments, or those who "had more difficulty adapting to novelty and showed more irritable distress" (p. 261), showed more internalising and total problem behaviours than children with easy temperaments (De Schipper et al., 2004). These findings suggest that children with internalising characteristics may experience ECCAs as more anxiety-provoking, and that for some of these children, exposure to anxiety-provoking characteristics in their ECCA may

give them the opportunity to get used to those characteristics, thus promoting resilience (Kendall et al., 2005). This underscores the potential influence that a child's psychological profile may have on the socio-emotional and behavioural consequences of their ECCA experience. It is important to note, however, that this study examined children only in FCCAs and not in ICCAs, and therefore a comparison between children in the two groups was not possible.

In reviewing the literature, it is apparent that the inconsistencies in children's experiences of different ECCAs may be due to individual psychological characteristics (Bassett et al., 2017; De Schipper et al., 2004). Research has highlighted the importance of these bidirectional effects, suggesting that, rather than focusing on the relative benefits of FCCAs versus ICCAs, it may be more important to ensure there is a good fit between the child's psychological capabilities and their ECCA (De Schipper et al., 2004). However, research identifying the mechanisms involved in the relationship between children's psychological profiles and the characteristics of different ECCAs remains limited (Fanti & Henrich, 2010).

ECCAs and School Transition

Transitioning into the formal school system is one of the most significant phases of a child's life, so it is important to assess a child's readiness for school, and their ability to transition into and adjust to kindergarten. Parents have traditionally viewed school readiness in terms of whether a child possesses the academic skills, such as maths, reading and language skills, necessary for them to handle the demands of formal schooling (Barbarin et al., 2008; Puccioni, 2015, 2018; Votruba-Drzal et al., 2015). However, when assessing school readiness, teachers place less emphasis on academic skills and more on a child's health, communication skills, enthusiasm, self-regulation skills and interpersonal skills (Abry et al., 2015; Rimm-Kaufman & Sandilos, 2004; United States Department of Education, 1993).

Although pre-academic skills are important (for a meta-analysis on preschool enhancement programs see Joo et al., 2020), in recent years many researchers have turned their attention to other variables that influence school readiness and a successful transition into kindergarten, such as a child's self-regulation (Duncan et al., 2018), executive functioning (Pellicano et al., 2017), socio-economic status (Hammer et al., 2017), social behaviour (Stormont et al., 2017) and socio-emotional competence (Hunter et al., 2018).

Currently, information on how ECCAs and psychological characteristics affect school adjustment is still in the early phases of development. There is some prior research that suggests that children who have attended FCCAs have poorer social skills (Ansari, 2018; NICHD ECCRN, 2003a, 2005b) and poorer behaviour (Coley et al., 2013; Rothbaum & Weisz, 1994; Stein et al., 2013) when entering and adjusting to kindergarten. However, it is recognised that other parental and child factors influence this relationship, such as gender, parental mental health and socio-economic status (Guild et al., 2017; Stein et al., 2013; Van Beijsterveldt et al., 2005). What is less known is how ECCAs and psychological characteristics interact to predict school adjustment, and thus this is a gap in the literature that needs to be explored.

Considerations and Limitations

It is important to acknowledge some issues relevant to the discussions in this review. Firstly, this chapter compared outcomes from a range of studies that varied in their sample type. For example, the NICHD study (NICHD ECCRN, 2001a, 2001b, 2002, 2003a, 2003b, 2005b) primarily studied children from middle-class families in the US, while other studies that were derived from the Head Start FACES (Coley et al., 2013; Votruba-Drzal et al., 2015) database included children from low-income families. The sample differences would have influenced the results of these studies, along with this review. It is also important to note that many factors, other than just the type, quantity and quality of ECCAs, influence children's

psychological and behavioural outcomes, such as maternal sensitivity and socio-economic status (Allhusen et al., 2001; NICHD, 2003b; Stein, Malmberg, Leach, Barnes, & Sylva, 2013; Van Beijsterveldt, Hudziak, & Boomsma, 2005). However, for the purposes of this review, the main focus was on how the type, quantity and quality of ECCAs, along with psychological characteristics, influenced children's outcomes.

This review noted substantial definitional variability and limited consistency in the way ECCAs were categorised across research studies. It is also noteworthy that definitions of the amount of child care were also inconsistent (Gialamas, Sawyer, et al., 2014; Van Beijsterveldt et al., 2005). For example, Van Beijsterveldt et al. (2005) defined a high level of childcare as 3.5 days per week, whereas Coley et al. (2013) defined it as more than 25 hours per week. These differences may reflect the norms of the associated culture. For example, Broekheizen et al. (2017) stated that "parents have a contract with a daycare for a certain amount of full-days per week, but in some daycares, it is possible to have additional half-day contracts" (p.6), which is typical in the Netherlands. Although this variability is understandable given that studies have been undertaken in different countries, it may limit the utility of comparisons of ECCA quantity, and the literature would be better served by the adoption of unified definitions of ECCA type and quantity for comparative purposes. Researchers in this area should consider using the categorisations suggested in this review, ICCAs and FCCAs, thus creating a consistent language for discussion in the literature of formal vs informal care arrangements.

There are also methodological limitations of the studies discussed. Firstly, although the studies may be longitudinal, not all studies administered all of their psychometrics at all time points (NICHD ECCRN, 2001b; Van Beijsterveldt et al., 2005), which limits their ability to measure a change in children as a function of their ECCA. Additionally, it limits researchers' ability to examine the interaction between ECCAs and psychological

characteristics. Secondly, there was a high degree of variability in the ways outcomes were assessed, and in whether the type, quantity *and* quality of ECCAs were considered. Few studies examined the social, emotional *and* behavioural outcomes of their sample (Broekhuizen et al., 2018; NICHD ECCRN, 2001b, 2005b; Pluess & Belsky, 2009). Furthermore, some studies failed to directly compare the influence of ECCAs on children's acquisition of skills because they assessed only one type of arrangement, or did not assess ECCA quantity and quality. Therefore, future research may consider assessing multiple aspects of functioning at a maximum number of time points so as to enable consistency. Such consistency would help to promote the development of knowledge in this area, which could then inform the development of future interventions implemented in ECCAs and in the home environment to improve children's outcomes.

The Current Project: Addressing the Gaps

There has been minimal investigation into the interactive relationship between ECCAs and psychological characteristics of children, and how this influences children's outcomes and their transition and adjustment to school. Firstly, there is only preliminary and limited data on this reciprocal relationship between ECCAs and children's psychological characteristics. Although previously published literature has developed from a focus on the influence of the type, quantity and quality of ECCAs on outcomes, it is important to note that various additional factors may influence children's social, emotional and behavioural functioning. Previous studies that have explored such factors have focused on child factors such as temperament and surgency. Since there is strong evidence that children with internalising and/or externalising profiles respond to environments differently from children with no behavioural or emotional challenges, research that considers a child's psychological profile may aid understanding in this area. Therefore, the current thesis adopts a reciprocal

approach to investigating how ECCAs influence children's functioning, which, to the best of our knowledge, is the first of its kind.

Secondly, a significant amount of literature examining the effects of ECCAs draws on pre-existing secondary datasets which are becoming outdated, such as the NICHD SECCYD. Although the data presented from these studies have been valuable in extending the ECCA literature, novel longitudinal studies which provide new insights are needed to answer new and specific research questions and thereby further knowledge in this area. Furthermore, large-scale ECCA studies are usually conducted through a public health lens, with the goal of improving ECCA programs and experiences. The goal of the current thesis is to apply a clinical lens, in order to shift the main focus onto the child and to understanding their specific responses to their environment.

This chapter has described the implications of different ECCAs for children's social, emotional and behavioural outcomes; discussed the role that psychological characteristics play in the influence of ECCAs; and reviewed the effects that ECCAs and psychological characteristics have on a child's transition to school. Although research in this area is emerging, further work is needed to better understand this relationship. As parents do not always have a choice of ECCA for their child, this knowledge can inform parents and caregivers about how best to support children in their ECCA by enhancing insights into why a particular child is responding in a particular way to their ECCA characteristics.

PRELUDE TO CHAPTER III

In the last chapter, it was recognised that intrapersonal and interpersonal factors are important to consider when assessing how ECCAs and psychological characteristics impact child development. Factors that characterise a child's day-to-day life at home, such as parental practices, access to educational and stimulating materials and a safe environment are included in this thesis in order to obtain data that will facilitate an assessment of the home environment quality. As home environment quality has previously been found to impact children's development (Abreu-Lima, 2009; Bradley et al., 2011; Bratsch-Hines & Vernon-Feagans, 2013; Burston et al., 2005; Goemans et al., 2016), inclusion of this measure was considered a key aspect of this thesis.

As research question 3 addresses home environment quality and how it impacts children's development, a brief and valid questionnaire that assessed this factor was required. The tools used in prior studies were not deemed suitable for this research either due to their excessive cost or length. Thus, in order to overcome these deficiencies, a validation study was deemed necessary to address the gap for this study and to potentially be available for future research.

This next chapter will begin by discussing some of the previous literature on how home environment quality influences child outcomes. It will then explain the methodology used to validate the Home Observation for Measurement of the Environment-Short Form Questionnaire (HOME-SF-Q). Finally, the results and discussion will be presented.

CHAPTER III: HOME-SF-Q VALIDATION

Home environment and parenting quality are crucial for shaping healthy child development (Burston et al., 2005). Many psychological, developmental and educational researchers have developed measures that can successfully and reliably evaluate these variables to demonstrate their effects on social, cognitive, emotional, behavioural and physical well-being. Through research it has become apparent that parenting and home environment quality have multiple effects on a child, including being linked to future cognitive performance (Lugo-Gil & Tamis-LeMonda, 2008), behavioural outcomes (Jackson & Scheines, 2005) and social functioning (Pluess & Belsky, 2010). Currently, the gold standard instrument for assessing the home environment is recognised to be the Home Observation for Measurement of the Environment (HOME) Inventory (Caldwell & Bradley, 1984).

The HOME is an observational measure combined with a semi-structured interview (Caldwell & Bradley, 1984; Hollenbeck, 1978). Its purpose is to assess the responsivity and involvement of the parent, their avoidance of physical punishment, the safety of the physical environment, and the play materials and opportunities provided for the child in the home (Caldwell & Bradley, 1984; Hollenbeck, 1978). The HOME inventory remains a frequently used instrument in research (Bradley et al., 2001; Campbell & Parcel, 2010; Dolan et al., 2009; Han et al., 2004; Horton et al., 2012; Totsika & Sylva, 2004), in many different countries including Scotland (Burston et al., 2005), the US (Zajac et al., 2020) and the Netherlands (Goemans et al., 2016). There are different versions of the HOME for children of different ages: Infant-Toddler (0–3 years old), Early Childhood (3–6 years old), Middle-Childhood (6–10 years old) and Early Adolescent (10–15 years old) versions (Burston et al., 2005). Early studies reported that the HOME subscales have a reliability of .52-.80 for the subscales and .90 for the total scale (Bradley et al., 1988), and more recent studies have

reported that kappa coefficients range from .683 to .867 for the subscales, and .813 for the total scale (Goemans et al., 2016). The HOME has also been deemed valid when compared with other well-known measures (Goemans et al., 2016) such as the Child Behaviour Checklist (CBCL; Achenback & Rescorla, 2001).

Another version of the HOME is the HOME-Short Form (HOME-SF). This version is favoured in research due to its brief nature, which makes it useful in many studies, including large-scale longitudinal studies such as the National Longitudinal Survey of Youth 1979 (NLSY79; Mott, 2004). Like the HOME, the HOME-SF has demonstrated high reliability and validity (Elardo et al., 1975; Elardo & Bradley, 1981; Mott, 2004; Yeates et al., 1983). While it contains significantly fewer items than the HOME, it still assesses the quality and quantity of school preparation and stimulation, parental involvement and support, and the safety of a child's physical home environment (Caldwell & Bradley, 1984; Sugland et al., 1995). Specifically, the HOME-SF has 5 subscales: (1) Stimulation, (2) School Preparation, (3) Positive Parental Involvement, (4) Physical Environment, and (5) No Physical Punishment (Caldwell & Bradley, 1984). However, since it is an observational measure, it is not feasible to use it in smaller-scale studies due to limitations on time and funding.

There is a need for a recent, reliable, valid and more concise questionnaire that assesses the home environment. The current literature offers limited measures which fit this description. The Home Screening Questionnaire (HSQ; Frankenburg & Coons, 1986) is a quick tool to identify the quality of home environments, however faces some challenges. Namely, the HSQ is also presented in multiple choice format where the reporter is asked to choose an answer that would best reflect what they would do. A drawback of this format is that the answer options may be incomplete or irrelevant, it may limit answers which can introduce a bias, or it may force the respondent to skip the question altogether (Fink, 2015; Rossi et al., 2013). Moreover, available tools such as the Home Environment Questionnaire

(HEQ; Sines et al., 1984) are not ideal for research purposes because they are onerous, with over 120 true-false items and lengthy questionnaires (requiring over >10 minutes' completion time); consequently lengthy questionnaires are associated with lower response rates (Galesic & Bosnjak, 2009). This part of the dissertation study will develop and validate the HOME-SF-Questionnaire (HOME-SF-Q) that will overcome the limitations of existing tools which are response formats, cost of the measures, and excessive questionnaire length.

Method

Participants

Participants were a part of a larger study that had previously received the HOME-SF-Q. Participants in the current study were 126 families of 51-72-month-old (4.3-6-year-old) children comprising 75 boys (59.5%) and 51 girls (40.5%). Of these families, 23 (18.3%) had a non-Australian background, and 106 (84.1%) parents were married. Almost half of the parents held a bachelor's degree (48.4%) and worked part-time (45.2%), and a quarter had a combined annual household income of >$200,000 (25.4%).

Procedure

Participants were recruited through day care centres, churches, flyers, social media, Google ads and allied health centres. Parents were invited to participate in the study by completing an online questionnaire, after providing consent, which they could access through a URL or QR code. Those willing to participate in a follow-up project received the same questionnaire two weeks later. In total, 61 questionnaires were completed approximately 3.6 weeks later (*range* = 6, *min* = 2, *max* = 8).

Instruments

Home Observation for Measurement of the Environment-Short Form Questionnaire (HOME-SF-Q). The gold standard assessment instrument for measuring the quality of a

child's home environment is an observation tool named the HOME (Goemans et al., 2016; Sugland et al., 1995). Since an observational measure was not appropriate for this larger study, a questionnaire that maps onto the HOME-SF items was developed with the assistance of the author of the HOME-SF, Professor Robert Bradley (personal communication; Sugland et al., 1995). Participants responded to 19 items on a 4-point Likert scale (i.e., always or almost always, often/very often, sometimes/occasionally, never or almost never). See Table 3.1 for example items in each subscale. A lower score represents better home environment quality.

Table 3.1

Example Questionnaire Item from Each Subscale of the HOME-SF-Q

Subscale	Example Questionnaire Item
Stimulation	I make educational videos available for my child
School Preparation	I spend time during the day trying to teach my child numbers
Positive Maternal Involvement	When my child asks me a question, I take the time I answer it
Physical Environment	My house has no clutter
No Physical Punishment	I grab or restrict my child

Statistical Analysis

To assess reliability, the internal consistency of the questionnaire was measured using Cronbach's alpha coefficient. An alpha coefficient equal to or greater than .60 was considered satisfactory (Schmitt, 1996; Taber, 2018). Test-retest reliability was assessed using the Cohen's kappa coefficient. A kappa coefficient between .41-.75 is reported as fair to good, and >.76 is excellent (Fleiss et al., 2013). Validity was assessed via an exploratory factor analysis and compared to the factor structure reported for the HOME-SF in an article by

Sugland et al. (1995). It was expected that the score would not change within 1 month, so a Bland-Altman plot was created to visualise the variation in the difference between the two time points. Specifically, this was to ensure that the measure demonstrated good test-retest reliability, and variance in the difference between the two time points was homogenous across the range of the score.

Results

Exploratory Factor Analysis

To proceed with an exploratory factor analysis (EFA), data should meet specific criteria: 1) the correlation matrix should show several correlation coefficients of .3 and above, 2) Bartlett's test of sphericity should be significant ($p < .05$), and 3) the Kaiser-Meyer-Oklin (KMO) measure of sampling adequacy should be 0.6 or greater (Pallant, 2007; Tabachnick et al., 2007). To assess whether the 19 items that measured home environment quality were suitable, a correlation analysis was carried out. The correlation matrix revealed the presence of 22 coefficient indices equal to or greater than 0.3. Moreover, the KMO measure of sampling adequacy and Bartlett's test of sphericity values were deemed suitable for further analysis, as shown in Table 3.2.

Table 3.2

KMO and Bartlett's Test of Sphericity

Kaiser-Meyer-Olkin Measure of Sampling Adequacy		.726
Bartlett's Test of Sphericity	Approx. Chi-Square	988.771
	Df	171
	Sig.	.000

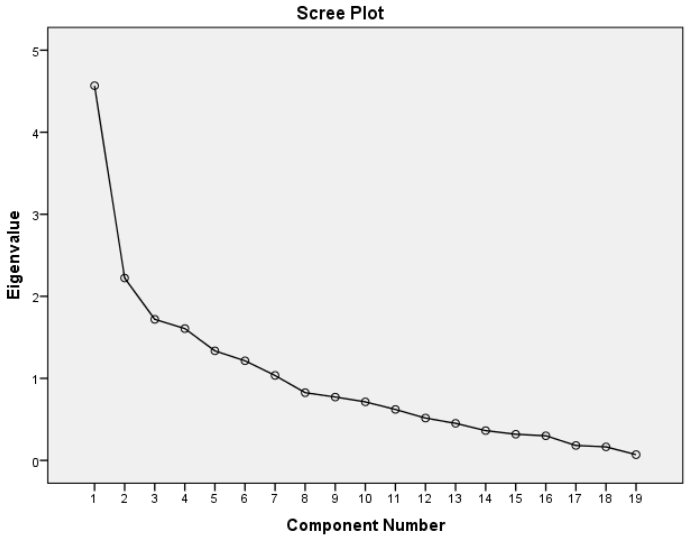
These results indicated the suitability of the data for a factor analysis (Pallant, 2007; Tabachnick et al., 2007), and thus the 19 items measuring home environment were subjected

to an EFA using the extraction method of principal components with Varimax rotation in SPSS v23 (IBM Corp, 2015).

The next step was to determine the number of factors to be extracted. The eigenvalue greater than one rule indicated that seven factors recorded eigenvalues of 1 or above (4.568, 2.223, 1.719, 1.607, 1.335, 1.214, 1.036). The scree plot also indicated a break between the seventh and eighth factors (see Figure 3.1). In light of this, an extraction of seven factors was considered appropriate. The seven factors explained 72.11% of the total variance. The variances explained by each of the extracted seven factors were 24.04%, 11.70%, 9.05%, 8.46%, 7.03%, 6.39% and 5.45% respectively.

Figure 3.1

Scree Plot for Home Quality Factors



According to Pituch and Stevens (2016), as a rule of thumb, only items with loadings equal to or greater than 0.4 are interpreted. A greater loading indicates the more the variable is a pure measure of that factor. In this validation study, there were no items that failed to show a relevant loading. Items were assigned to factors based on the highest factor loadings.

Three items cross-loaded on two factors. According to Costello and Osborne (2005), items loading on more than one factor should be considered for their conceptual

appropriateness, especially if items cross-load above .3 on more than one factor. Then, a decision is made whether to retain or omit these items from the final scale (Costello & Osborne, 2005). A review of these items considered them theoretically important when examining the home environment quality and thus were included in the final scale.

The new extracted factors were different from the original HOME-SF scales as proposed by Sugland et al. (1995), as can be seen in Table 3.3. Namely, Sugland et al. (1995) reported a five-factor structure, and the current study found seven. Four of the current factors are the same as those previously reported, while the fifth previously reported factor, stimulation, contained items that were found in three separate factors in the current study. The factor loadings obtained through the EFA are presented in Table 3.4.

Factor one was found to obtain high loadings (+ 0.40) from four items measuring *school preparation.* This factor is the same as the school preparation factor on the original HOME-SF measure, indicating that the *school preparation* scale operated effectively with the current sample.

Factor two obtained high loadings on four items measuring *physical environment*. This was the same as the physical environment factor on the original HOME-SF measure.

Factor three consisted of two items measuring internet use for educational purposes, best described as *online teaching and education*. Originally, these two items were part of the *stimulation* scale. However, the wording of the items was changed slightly to reflect current societal technology, and it then appeared that these two items were no longer loading onto the same factor as the original items in the previous version of the HOME-SF. Three other items were also found to load onto this factor but were included in other factors based on their higher loadings.

The fourth factor consisted of two items measuring *no physical punishment*. This factor's name, originally *no observed physical punishment*, has been changed to reflect the

nature of this self-report questionnaire. This finding is consistent with the original HOME-SF scale.

Table 3.3

Factor Structures of previous HOME-SF study by Sugland et al., (1995) Compared to the Factor Structure of the Current Study

Item and Description	Previous Factor Structure	Current Factor Structure
1. Read to Child	Stimulation	Engagement in Reading
2. Owns 10 Children's Books	Stimulation	Engagement in Reading
3. Owns 5 Tapes/Records/Edu Videos	Stimulation	Online Teaching and Edu
4. Child Taken on Outings	Stimulation	Outdoor and Edu Outings
5. Access to Mag/Newspaper/Online Apps	Stimulation	Online Teaching and Edu
6. Child Taken to Edu Venue	Stimulation	Outdoor and Edu Outings
7. Parent Helps Child Learn Numbers	School Preparation	School Preparation
8. Parent Helps Child Learn Colours	School Preparation	School Preparation
9. Parent Helps Child Learn Alphabet	School Preparation	School Preparation
10. Parent Helps Child Learn Shapes	School Preparation	School Preparation
11. Parent Converses with Child	Positive Maternal Inv	Positive Parental Inv
12. Parent Answers Child's Questions	Positive Maternal Inv	Positive Parental Inv
13. Parent is Positive and Praises Child	Positive Maternal Inv	Positive Parental Inv
14. House Reasonably Clean	Physical Environment	Physical Environment
15. House Minimally Cluttered	Physical Environment	Physical Environment
16. Child's Play Environment is Safe	Physical Environment	Physical Environment
17. Child's Home is Well Lit	Physical Environment	Physical Environment
18. Parent Does Not Slap/Spank Child	No Ob Physical Punish	No Physical Punish
19. Parents Do Not Restrict/Grab Child	No Ob Physical Punish	No Physical Punish

Note. Edu = Education; Mag = Magazines; Inv = Involvement; Ob = Observed; Punish = Punishment

Factor five obtained high loadings in two items that measured parent-child book reading, described as *engagement in reading*. Formerly these two items were part of the *stimulation* scale but were now found to load onto a separate factor.

The sixth factor, *positive parental involvement*, included three items. This is consistent with the original HOME-SF factor; however, the name has been changed from *positive maternal involvement* to *positive parental involvement* to encompass the role both parents play in parenting.

The seventh and final factor obtained high loadings of two items measuring *outdoor and educational outings*. These two items were originally part of the *stimulation* scale but were now found to load onto a separate factor.

Table 3.4

Rotated Factor Loadings for Exploratory Factor Analysis with Varimax Rotation of HOME-SF-Q Scales

	Component						
Item	1	2	3	4	5	6	7
10	.943						
8	.930						
9	.889						
7	.885						
14		.835					
15		.790					
16		.582					
17		.568					
3			.798				
5			.757				
19				.858			
18				.841			
2					.824		
1					.782		
11						.822	
13			.422			.539	
12			.468			.487	
4							.872
6			.465				.596

Reliability Analysis

The Cronbach alpha measure of internal consistency was calculated for each of the new derived factors. The following scales had moderate to high Cronbach's Alpha values: school preparation (α = 0.95), no observed physical punishment (α = 0.71), physical environment (α = 0.67), online teaching and education (α = 0.65), and outdoor and educational outings (α = 0.62). Cronbach's Alpha was lower for engagement in reading (α = 0.46) and positive parental involvement (α = 0.49). Although alpha values above 0.45 have been reported as "acceptable" and "sufficient" in other studies (Taber, 2018), these scales were further considered for inclusion or exclusion in the final measure. The reliability of the entire scale was then assessed and deemed fairly high (α = 0.80). Deletion of the items in the *engagement in reading* and *positive parental involvement* scales did not significantly improve the Cronbach's alpha of the entire scale and therefore the decision was made to keep these items. These items were retained also because of their theoretical importance, notwithstanding their psychometric properties.

Inter-Item Test-Retest Reliability

Cohen's κ was run to determine the extent of agreement (test-retest reliability) between parents' responses on the HOME-SF-Q at time point 1 and time point 2. While it is possible to use Pearson's correlation coefficients for sum scores, the limitation is that with the ordinal scales and scores used in the study, the Pearson's coefficient reduces to a calculation of Phi. Even with data with completely random scores at test and re-test (i.e. no association) can show a positive and significant value correlation value. Cohen's κ was used over a Pearson's r as it includes an adjustment for the level of correlation expected by chance. The bias-adjusted and prevalence-adjusted kappa (PABAK) was chosen as it reflects the ideal situation, adjusting for any high or low bias that may be prevalent in the data (Chen et al., 2009; Sim & Wright, 2005). There was fair to excellent agreement on all items, as seen in

Table 3.5. Additionally, a Bland-Altman (B-A) plot was used to assess the agreement between the parent's overall scores on the HOME-SF-Q at time point 1 and time point 2 (see Figure 3.2). There was a small overall shift in scores between April and May (average mean difference -2), but this was consistent across all levels of the score, and there was no evidence of changes in the variance of difference between the two time points as the mean score increased.

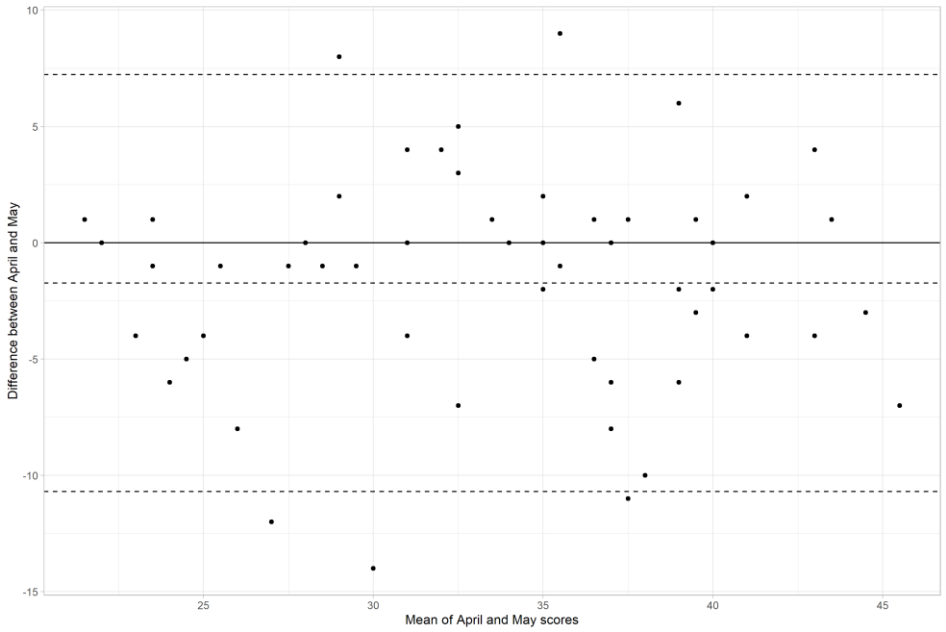
Table 3.5

Kappa, Weighted Kappa, and Prevalence- and Bias-Adjusted Kappa for Items at Time Point 1 and Time Point 2

Item number	Kappa	Weighted Kappa	Prevalence and Bias Adjusted Kappa
1	0.6112	0.6834	0.7111
2	0.2424	0.2424	0.8889
3	0.2692	0.4072	0.3333
4	0.5088	0.5000	0.6889
5	0.3755	0.4879	0.4222
6	0.4081	0.5494	0.4667
7	0.3264	0.4486	0.3556
8	0.4144	0.5617	0.4222
9	0.3887	0.4923	0.4000
10	0.4753	0.5732	0.4889
11	0.3455	0.3455	0.8667
12	0.4375	0.4306	0.6667
13	0.4106	0.4687	0.6667
14	0.5453	0.6218	0.6222
15	0.3144	0.5134	0.3556
16	0.1840	0.2626	0.5778
17	0.4526	0.4526	0.7778
18	0.6786	0.7273	0.8667
19	0.4188	0.4231	0.6222

Figure 3.2

Bland Altman Plot for Parent's Overall Scores on the HOME-SF-Q at Time Point 1 and Time Point 2



Discussion

The present study aimed to develop a reliable, valid and concise questionnaire to assess the quality of the home environment. This new measure is called the HOME-SF Questionnaire (HOME-SF-Q). The HOME-SF-Q is based on the well-known and extensively used observational measure, the Home Observation for Measurement of the Environment (HOME) Inventory (Caldwell & Bradley, 1984).

The results of the present study demonstrate that the items that comprise the HOME-SF-Q measure seven distinct factors. The first, school preparation, reflects a child's readiness for school, encompassing parents' engagement in activities that help their child learn to identify numbers, colours, the alphabet and shapes. The next factor, physical environment, relates to the safety and cleanliness of the home. Online teaching and education, the third factor, centres on online videos and apps that are educational. The fourth factor, no physical

punishment, reflects the parent's restraint in not physically punishing the child. Engagement in reading, the fifth factor, relates to the parent's engagement in activities that help their child learn to read. The sixth factor, positive parental involvement, encompasses parental engagement with the child in attachment-rich experiences such as praising and conversing with the child. The final factor, outdoor and educational outings, reflects a child's involvement in activities in outdoor and educational settings.

In general, the items contained in the HOME-SF-Q demonstrated variable psychometric properties. Although most items and factors demonstrated an acceptable to excellent alpha value, there were some exceptions. The factors *engagement in reading* and *positive parental involvement* had lower alpha values, as did items 6, 12 and 13 (See Table 3.3 for a description of these items), and therefore should be approached with caution. However, previous research has shown that instruments with a low alpha value can still prove useful in research (Schmitt, 1996). The decision was made to obtain these items as they contributed to content validity and provided clinical value, given that these scales will prove useful in studies of school readiness (e.g., development of literacy and oral expressive skills) and of parental quality (e.g., how parenting involvement influences child development). It is expected that these aspects of the tool will be strengthened when more data is added in future research (Ponterotto & Ruckdeschel, 2007; Tavakol & Dennick, 2011).

It is important to note that the current study was conducted during the early stage of the Severe Acute Respiratory Syndrome-Coronavirus-2 (SARS-CoV-2 or COVID-19) pandemic, between April-May 2020. At the time the retest data were being collected, Australia had instituted home-based learning, working from home, lockdowns and social distancing. Therefore, the test-retest reliability was also variable, since at this second time point many families would have faced challenges in taking children to educational venues and finding the time to ensure the household was clean. Additionally, poor kappa values seen

in the school preparation factor may have resulted not only from parents having limited time and attention due to the pandemic, but also the necessity for them to engage in their children's learning as formal schooling switched to online. Additionally, it is recommended that future versions of this measure consider different versions for different ages, in a similar way to previous versions of the observational HOME-SF (Burston et al., 2005). These may include age-appropriate school preparation items for children aged 6 years and older.

This measure is likely to be useful in future studies that seek to assess how the home environment and parenting affect a child's development, including but not limited to research assessing school readiness, the impact of family and home factors on children's development and/or adjustment to formal schooling, the impact of parental factors on children's functioning, parental nurturance, and parenting and attachment. The psychometric properties of the HOME-SF-Q will provide future researchers in this area with valid and reliable information. The HOME-SF-Q also demonstrates overall good test-retest reliability, and is therefore likely to be sensitive to changes over time in the home environment and parenting when used in future cohort and/or randomised controlled trial studies.

In summary, the novel HOME-SF-Q measure appears to demonstrate reliable and valid scores in a sample of 4–6-year-old children. This measure can be of use in future research studying home and parental influences on children's development and has the major advantage of being brief and of a self-report nature. It is anticipated that researchers will be able to use this new measure to advance the field of child development research.

CHAPTER IV: METHODOLOGY

This chapter describes the methodology used to conduct this project. The current dissertation utilised a longitudinal cohort study design. The data collected and discussed in this chapter were original, and thus the analyses were conducted on a primary dataset. This chapter addresses the sample characteristics, study design and ethical considerations, method and measures utilised, recruitment of participants, and the process of data generation and analysis.

Participants

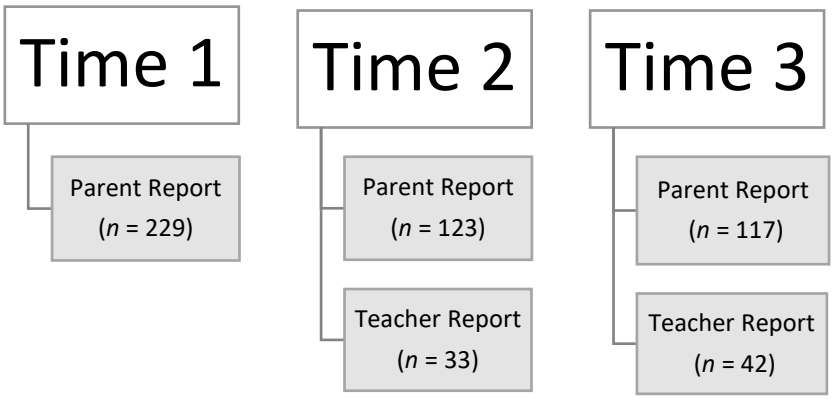
The analysis sample consisted of 229 parents of children who were in their final year of early child care, prior to entering formal schooling. Children were included in the analysis if they had been in their current ECCA for at least six months. The mean age of children was 62.5 months (i.e. approximately 5 years old), and there were more male children (54.6%) than female. The sample was composed mostly of Anglo-Australian children (81.2%) who were born in Australia (96.1%).

The mean age of parents was 36.8 years. In the sample, 38% of parents worked part-time, 21.8% had a combined annual household income of >$200,000, and nearly half held a bachelor's degree (49.8%). Parents were mostly married (80.3%), were likely to have a partner living in the household (89.6%), and had at least two children under the age of 18 living at home (90%).

Out of the 75 total responses received from teachers, 17 came from teachers who responded at both time points 2 *and* 3, while 58 teachers responded at either time point 2 *or* 3. Of the 58 teachers who participated in the study, the average teaching experience was 16 years (*min* = 1.5, *max* = 42).

Figure 4.1

Sample Size at Each Time Point



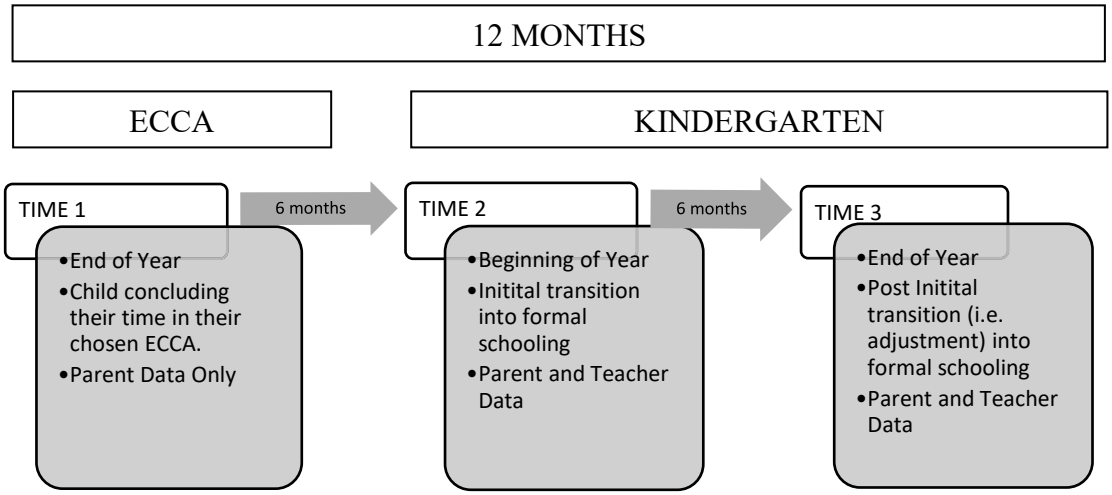
Study Design

Throughout this longitudinal cohort study, parents reported data on their family and child across three different time points over 12 months. This particular design was chosen in order to assess how a child was impacted by their ECCA while still in the ECCA, with the multiple additional data collection points over the following 12 months revealing how these impacts changed or evolved during a child's transition and adjustment to kindergarten.

This cohort study used an online questionnaire generated using Qualtrics software, Version XM (Qualtrics, 2020). The study was approved by the Human Research Ethics Committee (HREC) at the University of Technology Sydney (Project ID ETH18-2307, Amendments: ETH19-3741; ETH20-4621; ETH20-5241) and the NSW State Education Research Applications Process (SERAP; Project ID 2018769). Letters of approval provided by both HREC and SERAP are presented in Appendix A.

Figure 4.2

Study Design



Study Variables

The independent variables in this study included child care type, child care quantity, child care quality, home environment quality, caregiver and child characteristics, and the child's psychological profile. These were measured with demographic questionnaires: the What is Happening in this Class (WIHIC; Fraser et al., 1996), the Home Observation Measurement of the Environment-Short Form Questionnaire (HOME-SF-Q; see Chapter 3), the Child Behaviour Checklist (CBCL; Achenback & Rescorla, 2001) and the Preschool Kindergarten Behaviour Scale-2 (PKBS-2; Merrell, 1996, 2002). The dependent variables were child emotional, social and behavioural functioning. These were also measured by the CBCL and PKBS-2. A description of each measure used in this context follows, and Table 4.1 provides a summary of the main study variables.

Table 4.1

List of Main Study Variables

Variable	Definition	Scale	Range of Acceptable Values
Psychological Profile		Categorical	1 = Externalisers, 2 = Internalisers, 3 = Combined, 4 = None (Control)
Child care Type		Categorical	1 = Informal Child Care Arrangement, 2 = Formal Child Care Arrangement
Child care Quantity		Categorical	1 = <20 Hours Per Week, 2 = 21-30 Hours Per Week, 3 = 31+ Hours Per Week
Child care Quality (WIHIC)		Likert	1 = Always, 2 = Sometimes, 3 = Never
Home Quality (HOME-SF-Q)		Likert	1 = Always or Almost Always, 2 = Often/Very Often, 3 = Sometimes/Occasionally, 4 = Never/Almost Never
Emotional Functioning (CBCL)		Likert	0 = Not True, 1 = Sometimes True, 2 = Very True or Often True
Behavioural Functioning (CBCL)		Likert	0 = Not True, 1 = Sometimes True, 2 = Very True or Often True
Social Functioning (PKBS-2)		Likert	0 = Never, 1 = Rarely, 2 = Sometimes, 3 = Often

Measures

Child Care Characteristics

Type. As defined in chapter 2, children were in one of two types of care: a Formal Child Care Arrangement (FCCA) or an Informal Child Care Arrangement (ICCA). Children who were predominantly cared for by a formal service provided in an out-of-home setting were categorised in the FCCA group. This included centre-based care (CBC) programs such as preschool and day care. Children who were predominantly cared for in an informal setting,

such as by parents, relatives or non-relatives (i.e. neighbour), or in home-based or and employed care (i.e. nannies), were categorised in the ICCA group.

Quantity. Caregivers who had a child in a FCCA provided information on how many hours their child spent in the FCCA per week. Parents indicated whether their children attended their ECCA for: <20 hours a week, 21-30 hours a week or 31 hours or more, with over a third of children spending between 21-30 hours in care (37%). Caregivers also specified how long their child had been attending their particular ECCA, with just over half of children spending longer than two years in their current arrangement (52.2%).

Quality. To assess child care quality, participants completed the WIHIC (see child care arrangement quality measures section; Fraser et al., 1996). Home environment quality was assessed via the HOME-SF-Q (see child care arrangement quality measures section).

Child Care Arrangement Quality Measures

What is Happening in this Class (WIHIC; Fraser et al., 1996). The WIHIC is a 20-item questionnaire completed by caregivers which measures a parent's perception of their child's classroom environment quality. The version of the WIHIC questionnaire used in this study (Allen & Fraser, 2002) contains five subscales with four items in each scale. These subscales are: (1) Student Cohesiveness, (2) Teacher Support, (3) Involvement, (4) Cooperation, and (5) Equity. Table 4.2 shows descriptions and sample items from each subscale in the WIHIC. Each item is responded to on a 3-point Likert scale (i.e. always, sometimes, never). Scores on each subscale are combined to form one overall score. Lower scores represent better classroom quality. Internal consistency reliabilities range from 0.77-0.89 (Allen & Fraser, 2002).

Table 4.2

Descriptions and Sample Items in the WIHIC (Fraser et al., 1996)

Subscale	Description	Sample Item
Student Cohesiveness	Degree to which students are polite and supportive of one another	My child has friends in this class
Teacher Support	Extent to which teachers assist, contribute to, and show interest for their students	The teacher's questions help my child understand
Involvement	How well students pay attention, engage in discussions, and explain their solutions	My child can share his/her ideas
Co-operation	The degree to which students can support one another rather than compete	My child shares his/her supplies with other kids
Equity	Extent to which students believe their teachers' treatment of them is fair compared to their peers	My child gets the same chance to participate as other kids

Home Observation Measurement of the Environment-Short Form Questionnaire (HOME-SF-Q). The HOME-SF-Q is a questionnaire completed by caregivers which assesses the child's home environment quality. Participants responded to 19 items on a 4-point Likert scale (i.e., always or almost always, often/very often, sometimes/occasionally, never or almost never). There are 7 subscales in this questionnaire: (1) school preparation, (2) physical environment, (3) online teaching and education, (4) no physical punishment, (5) engagement in reading, (6) positive parental involvement, and (7) outdoor and educational outings. An example item is "I read to my child at least once a day". Scores on each subscale are combined to form one overall score. A lower score represents better home environment quality. The HOME-SF-Q has a reliability of .80 (see chapter 3).

Child Outcome Measures

The Child Behaviour Checklist (CBCL) for Ages 1½ to 5 and 6-18 (Achenbach, 1991; Achenbach & Ruffle, 2000). The Child Behaviour Checklist (CBCL) is a 100-113-

item checklist (depending on age) that was used to evaluate child emotional and behavioural functioning. The version of the CBCL for older children (6-18 years) has eight syndrome scales: anxious/depressed, withdrawn/depressed, somatic complaints, social problems, thought problems, attention problems, rule-breaking behaviour and aggressive behaviour. The version for younger children (1.5-5 years) has seven different scales: emotionally reactive, anxious/depressed, somatic complaints, withdrawn, sleep problems, attention problems and aggressive behaviour. These different subscales combine into two broader scales: internalising problems (e.g., "cries a lot") and externalising problems (e.g., "hits others", "doesn't seem to feel guilty after misbehaving"). Caregivers rate how true each item is for their child within the last 2 months on a 3-point Likert scale (i.e., not true, somewhat/sometimes true, very/often true). The CBCL has a strong test-retest reliability of .85, and high inter-rater agreement of .61 (Achenbach, & Rescorla, 2000). Raw scores are converted into standard T-scores, based on normative data for children of the same age. For the total externalising and internalising scores, a t-score ≥ 60 is considered elevated compared to the normative sample.

The Teacher Report Form (TRF) for Ages 1½ to 5 and 6-18 (Achenbach & Rescorla, 2000; Achenback & Rescorla, 2001). The Teacher Report Form (TRF) is a 100-113-item checklist (depending on age) that was used to evaluate child emotional and behavioural functioning. The version of the TRF for older children (6-18 years) has eight syndrome scales: anxious/depressed, withdrawn/depressed, somatic complaints, social problems, thought problems, attention problems (inattention and hyperactivity-impulsivity), rule-breaking behaviour and aggressive behaviour. The version for younger children (1.5-5 years) has six different scales: emotionally reactive, anxious/depressed, somatic complaints, withdrawn, attention problems and aggressive behaviour. These different subscales combine into two broader scales: internalising problems (e.g., "worries") and externalising problems

(e.g., “breaks school rules”). Teachers rate how true each item is for the child within the last 2 months on a 3-point Likert scale (i.e., not true, somewhat/sometimes true, very/often true). The TRF has a strong test-retest reliability of .92, and a moderate inter-rater agreement of .54 (Achenbach, & Rescorla, 2000). Raw scores are converted into standard T-scores, based on normative data for children of the same age. For the total externalising and internalising scores, a t-score ≥ 60 is considered elevated compared to the normative sample.

Preschool Kindergarten Behaviour Scale-Second Edition (PKBS-2; Merrell, 1996, 2002). The PKBS-2 is a behaviour rating scale completed by parents, teachers and other informants. It is used for children aged 3-6 years. The PKBS-2 lists 76 items across two scales: Social Skills and Problematic Behaviour. Informants rate the frequency with which a child models a behavioural item on a 4-point Likert scale (i.e., never, rarely, sometimes, often). The Social Skills scale comprises 34 items across three scales: (1) social cooperation, (2) social interaction, and (3) social independence. The Problem Behaviour Scale comprises 42 items across two subscales: (1) internalising and (2) externalising. These internalising and externalising subscales are then divided further into five subscales, three for externalising problems (self-centred/explosive, attention problems/overactive and anti-social/aggressive) and two for internalising problems (social withdrawal and anxiety/somatic problems). Table 4.3 provides sample items from each subscale in the PKBS-2. A higher score indicates better functioning. The alpha and split-half coefficients for the total scores of the PKBS-2 range from .90 to .97 (Merrell, 2002).

COVID-19 Questionnaire

Participants provided information through a self-report questionnaire that assessed how COVID-19 had impacted different areas of the family’s life. The creation of this questionnaire was informed by the *Life during COVID-19* survey conducted by the Australian Institute of Family Studies (2020), and it included 29 items that assessed three domains. The

Table 4.3

Sample Items from the PKBS-2 (Merrell, 2002)

Subscale	Sample Item
Social Skills Scale	
Social Cooperation	Follows instructions from adults
Social Interaction	Invites other children to play
Social Independence	Makes friends easily
Problem Behaviour Scale	
Self-Centred/Explosive	Wants all the attention
Attention Problems/Overactive	Disobeys rules
Antisocial/Aggressive	Calls people names
Social Withdrawal	Has problems making friends
Anxiety/Somatic Problems	Is afraid or fearful

three scales were: (1) Parental Employment, (2) Family Life, and (3) School Experience. The Parental Employment scale contained 10 items that evaluated how COVID-19 had impacted parents' employment, as reflected in, for example, reduced hours or working from home. The Family Life scale contained 11 items that assessed how COVID-19 had impacted the family's connectedness to one another and overall cohesiveness. The School Experience scale contained eight items that assessed how COVID-19 had impacted the child's academic experience, as reflected in, for example, the move to remote learning and lack of contact with teachers/classmates. Table 4.4 provides sample items from each subscale in the COVID-19 Questionnaire. The alpha coefficient for the total score of the COVID-19 Questionnaire was .777. The Parental Employment, Family Life and School Experience scales had an alpha coefficient of .803, .599 and .680, respectively.

Table 4.4

Sample Items from the COVID-19 Questionnaire

Subscale	Sample Item
Parental Employment Scale	My position was ceased (e.g. stood down or made redundant)
Family Life Scale	As a family, we felt very connected to one another
School Experience Scale	My child stopped physically attending school i.e. undertook remote learning

Caregiver and Child Characteristics

Caregivers provided information on their age, employment, annual household income, education level, marital status, number of parents within the household, number of children under 18 in the household, and parental history of mental health concerns. Caregivers also provided additional information about their child, including birth weight, ethnicity, age, gender, developmental history and country of birth.

Procedure

Parents were recruited through flyers and advertisements at day care centres, churches, social media, Google ads and allied health centres. Parents were invited to participate in the study by completing an online questionnaire which they could access through a URL or QR code. A copy of the flyer is presented in Appendix B. Consent was obtained from all participants before they completed the questionnaire. The Participant Information Statement and Participant Consent Form are also presented in Appendix B. Participants were asked a series of questions that resulted in generation of a unique participant code. Data were then collected on the demographic questions and all other measures. Parents completed the online questionnaire at three different time points: at the end of the academic year prior to their child entering formal school, while the child was still enrolled in their ECCA (time point 1), at the beginning of the academic year once their child

had entered formal schooling (time point 2), and at the end of the child's first year of formal education (time point 3). Completing the questionnaire took approximately 45 minutes at time point 1, 19 minutes at time point 2, and 27 minutes at time point 3. Participants entered a draw to win one of 10 $100 gift cards at each data time point.

At time points 2 and 3, teachers were also invited to complete the online questionnaire. At the conclusion of the time point 2 parental questionnaire, participants were prompted to actively consent to the researchers contacting their child's classroom teacher by supplying the name of the child's school, the school's principal details (name, email address) and the teacher's details (name, email address). If participants provided this data, the researchers contacted the school principal to gain consent to contact the teacher. Once this consent was granted, the teacher was emailed and invited to participate in the online questionnaire.

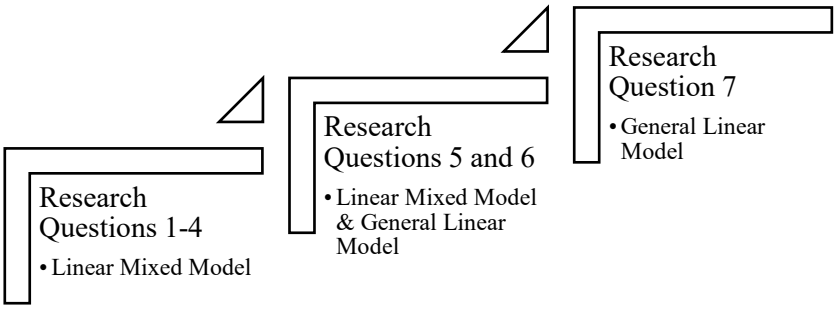
Statistical Analysis

The data was analysed using SAS version 9.4. Continuous summary data are presented as means with standard deviation, and median with interquartile range. Categorical variables are summarised by the number and percentage of the sample. The key dependent variables (CBCL and PKBS-2) were used in continuous form. Figure 4.3 shows the analyses used to answer the research questions. Where the analysis required the same sample to be analysed over time, a linear mixed model was chosen because of the continuous nature of the dependent variables and the non-independence of repeated measurements over time from the same participants (accounted for with the exchangeable correlation structure). The linear mixed model is also robust to a missing-at-random, i.e., estimates presented are adjusted to what would be expected if the participants lost to follow-up had provided complete data, conditional on the information included in the linear mixed models (e.g., baseline and follow-up levels of outcomes and covariates; Rubin, 1976).

For research question 1 (RQ1), a linear mixed model was used for measurements at all three time points, with a separate model for care arrangements and psychological characteristics. This analysis was used with two models. The first model was used with time point, covariate (care/profile), and interaction between time and covariate. The second model was a repeat of the first, but with confounding variables included. This estimated the absolute value of the measurement at a particular time.

Figure 4.3

Analyses Used to Answer Corresponding Research Questions



For research questions 2 (RQ2), 3 (RQ3) and 4 (RQ4), a linear mixed model was used to estimate the measurement of the dependent variables at each time point, for children in formal care (RQ2 and RQ4), and in both formal and informal care (RQ3). The model used for RQ2 and RQ3 included the time point, quality measure (HOME-SF-Q or WIHIC) and the interaction between the two. The model used for RQ4 included the time point, quantity measure (time), and the interaction between the two. This was used to estimate the time-specific association (beta coefficient) between quality or quantity score, and between social, emotional and behavioural functioning.

For research questions 5 (RQ5) and 6 (RQ6), a linear mixed model was used to estimate the difference in the dependent variables between ECCAs and psychological profiles at each time point, and to generate an overall estimate of difference across all time points.

This model included time point (as a categorical variable) and the key independent variable (ECCA or psychological profile). For change from baseline score at time points 2 and 3, the model included the covariate of time, baseline measurement (i.e. ANCOVA approach), ECCA type, psychological profile, and the interaction between all of these. The p-value associated with the interaction was used to assess whether there were differences in the effect of care type according to psychological profile. The difference in the effect of ECCA type according to different psychological profiles compared to a normal profile at each time point was estimated and tested with linear combinations of the regression coefficients (LSMESTIMATE in SAS). These models were also repeated with a predetermined list of confounding variables. The following variables were controlled for in the adjusted analyses due to their well-established association with the child outcome measures: caregiver education level, annual household income, number of parents in the household, child gender and parental mental health history. It is common in clinical practise to compare children with grade-matched peers instead of age-matched peers. As this research is looking at children at a particular point in time, that being the year prior to kindergarten attendance, it was not deemed necessary to include children's age as a controlled variable.

For teacher-reported data at time point 3, a general linear model was conducted for each measurement, with a separate model for ECCA type and psychological profile, and additionally repeated without and with adjustment for predetermined confounders.

For research question 7 (RQ7), a general linear model of measurements at time point 3 was conducted, with the association (beta coefficient) estimated and tested separately, and then simultaneously (ie., family, job and school in the same model), for each measurement with and without adjustment for the predetermined confounders.

The results include both adjusted and unadjusted results. The unadjusted results is meaningful in interpreting the data in the current study. They reflect that although you may

observe a difference in the real world, as seen in some of the unadjusted results, once you adjust for the differences of various covariates, the differences disappear. This shows that what may be observed is unlikely to be due to the care arrangement itself or the child's psychological characteristics, but other factors such as the family's annual household income or the number of parents in the household.

CHAPTER V: RESULTS

Quality Check

The data were first reviewed and cleaned to address any inaccuracies in data entry or missing information. Thirty-three participants failed to report the child's age. These values were imputed using the average mean for that variable. The multiple imputation approach was not conducted due to lack of statistical support to conduct this advanced technique. A comparison of child/parent characteristics by missing/not missing at the follow-up points was compared. Whilst there were some minimal differences lost to follow-up, the resulting difference was limited and not significant. Insufficient data were provided by teachers at time point 2, therefore only teacher data collected at time point 3 were used in the final analysis. The baseline characteristics were similar between the groups, and descriptive statistics were generated (See Table 5.1).

Creation of Psychological Characteristic Groups

One of the main aims of this project was to look at children in various psychological categories. Therefore it is important to make a distinction between control children and children experiencing significant problem behaviour. To achieve this, children were grouped according to their psychological profile at time point 1. The internalising group (n = 31) consisted of children who scored in the borderline or clinical ranges of the internalising scale on either the CBCL or PKBS-2; children in the externalising group (n = 22) were those who scored in the borderline or clinical ranges of the externalising scale on either the CBCL or PKBS-2; children in the combined group (n = 33) scored in the borderline or clinical ranges of the externalising and internalising scales on either the CBCL or PKBS-2; and finally, children in the control group (n = 143) scored in the normal range on the externalising and internalising scales of both the CBCL and PKBS-2.

Research Question 1) Effect of Different ECCAs or Psychological Characteristics on Social, Emotional and Behavioural Outcomes

ECCAs and Outcomes. A linear mixed model was used to estimate the association between ECCAs and child outcomes. At time point 1, there was no statistically significant mean difference (*MD*) between ECCAs and emotional or behavioural scores on the CBCL (see Figure 5.1). Social skills, as measured by the PKBS-2, improved significantly for children in formal care compared with children in informal care, *MD* = 4.13, 95% CI [0.28, 7.98], *p* = .036; however, this difference was not significant after adjustment for confounders, *Adjusted p* = .14.

Psychological Profiles and Outcomes. A linear mixed model was used to estimate the association between child psychological profiles and child outcomes. At time point 1, internalisers (*MD* = 14.94, 95% CI [11.67, 18.22], *p* < .001, *Adjusted p* < .001) and combined children (*MD* = 21.23, 95% CI [18.04, 24.43], *p* < .001, *Adjusted p* < .001), compared with the control group, had poorer emotional functioning, as measured by the CBCL (see Figure 5.2 and Appendix C, Table 5.3). There were no statistically significant mean differences between externalisers and the control group on emotional functioning measures, *MD* = 1.88, 95% CI [-1.90, 5.67], *p* = .33.

At time point 1, externalisers (*MD* = 13.82, 95% CI [10.28, 17.36], *p* < .001, *Adjusted p* < .001) and combined children (*MD* = 16.45, 95% CI [13.47, 19.44], *p* < .001, *Adjusted p* < .001), compared with the control group, had poorer behavioural functioning, as measured by the CBCL. By contrast, there was no statistically significant mean difference between internalisers and the control group on behavioural functioning, MD = 2.23, 95% CI [-0.83, 5.29], *p* = .15.

Table 5.1

Descriptive Statistics of Sample at Time Point 1 for Demographic Variables, Disaggregated by Psychological Profile and ECCA Type (N = 229).

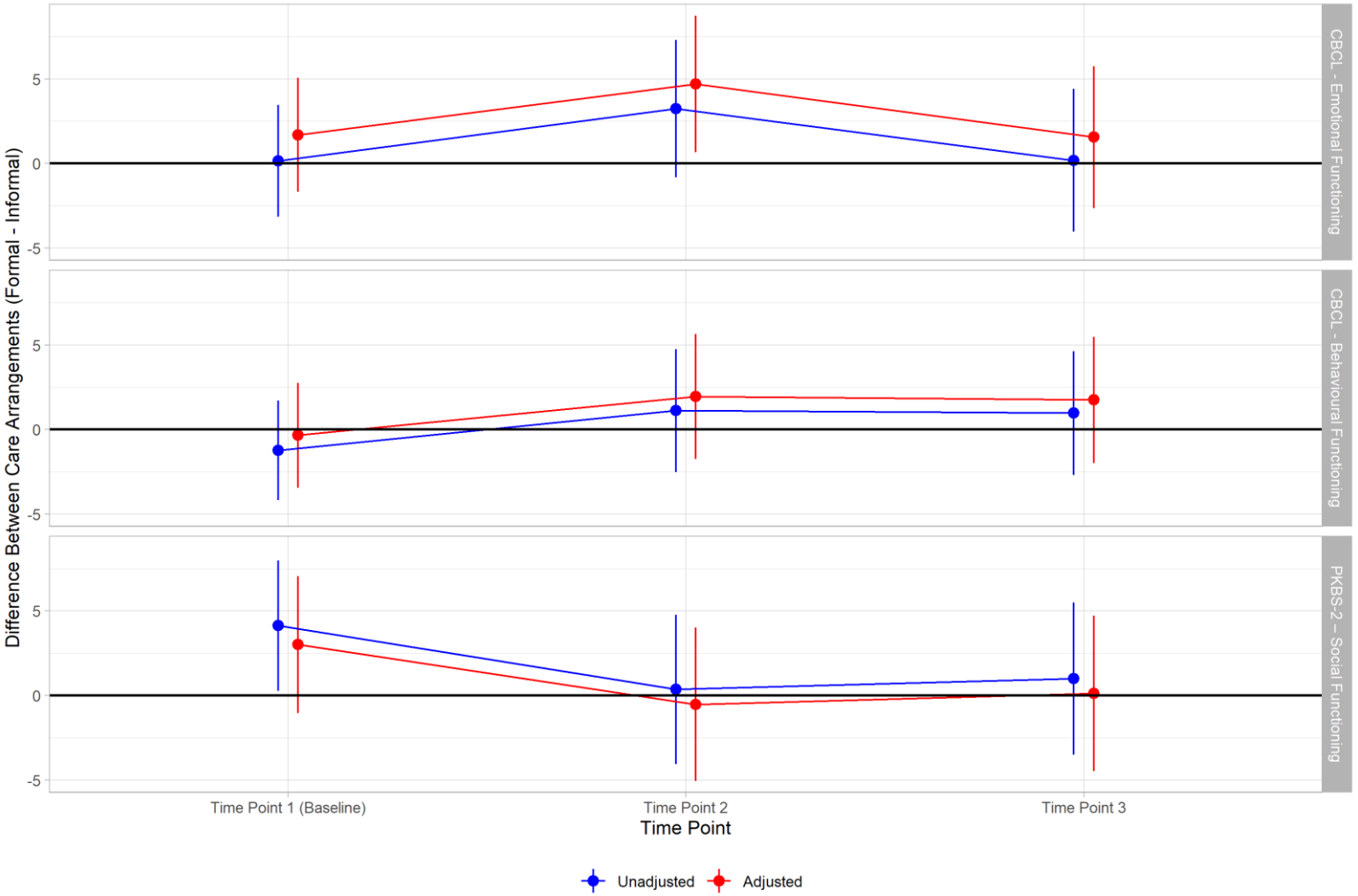
	Psychological Profile				Early Child Care Arrangement	
Family Characteristics	Control (n = 143)	Internalisers (n = 31)	Externalisers (n = 22)	Combined (n = 33)	Formal (n = 170)	Informal (n = 59)
	M (SD)	*M (SD)*	*M (SD)*	*M (SD)*	*M (SD)*	*M (SD)*
Child Age (months)	63.31 (4.88)	63.35 (5.37)	62.33 (5.01)	58.45 (10.47)	62.72 (6.52)	61.92 (5.44)
Caregiver Age (years)	37.00 (4.59)	37.03 (5.28)	36.09 (5.24)	36.55 (5.03)	37.21 (4.39)	35.81 (5.70)
Child Birth Weight (kg)	3.54 (0.53)	3.26 (0.55)	3.30 (0.57)	3.41 (0.63)	3.44 (0.56)	3.51 (0.56)
	n (%)	*n* (%)	*n* (%)	*n* (%)	*n* (%)	*n* (%)
ECCA Length						
Past 6 months	4 (2.8%)	1 (3.2%)	0 (0.0%)	4 (12.1%)	5 (2.9%)	4 (6.8%)
Past year	20 (14.0%)	8 (25.8%)	8 (36.4%)	6 (18.2%)	27 (15.9%)	15 (25.4%)
Past two years	38 (26.6%)	7 (22.6%)	5 (22.7%)	8 (24.2%)	45 (26.5%)	13 (22.0%)
Longer than two years	81 (56.6%)	15 (48.4%)	9 (40.9%)	15 (45.5%)	93 (54.7%)	2 (45.8%)
Child Gender						
Male	79 (55.2%)	18 (58.1%)	14 (63.6%)	14 (42.4%)	99 (58.2%)	26 (44.1%)
Female	64 (44.8%)	13 (41.9%)	8 (36.4%)	19 (57.6%)	71 (41.8%)	33 (55.9%)
Child Ethnicity						
Anglo-Australian	117 (81.8%)	26 (83.9%)	17 (77.3%)	26 (78.8%)	139 (81.8%)	47 (79.7%)
Other European	6 (4.2%)	3 (9.7%)	2 (9.1%)	0 (0.0%)	8 (4.7%)	3 (5.1%)
Asian	7 (4.9%)	1 (3.2%)	0 (0.0%)	0 (0.0%)	6 (3.5%)	2 (3.4%)
Indian/Sri Lankan/Pakistani	1 (0.7%)	0 (0.0%)	1 (4.5%)	2 (6.1%)	3 (1.8%)	1 (1.7%)
Middle Eastern	1 (0.7%)	0 (0.0%)	0 (0.0%)	1 (3.0%)	2 (1.2%)	0 (0.0%)
South American	3 (2.1%)	1 (3.2%)	1 (4.5%)	1 (3.0%)	4 (2.4%)	2 (3.4%)
Aboriginal or Torres Strait Islander	1 (0.7%)	0 (0.0%)	1 (4.5%)	0 (0.0%)	1 (0.6%)	1 (1.7%)
Pacific Islander	0 (0.0%)	0 (0.0%)	0 (0.0%)	1 (3.0%)	0 (0.0%)	1 (1.7%)

Other	7 (4.9%)	0 (0.0%)	0 (0.0%)	2 (6.1%)	7 (4.1%)	2 (3.4%)
Child Birth Country						
Australia	138 (96.5%)	29 (93.5%)	22 (100.0%)	31 (93.9%)	169 (99.4%)	51 (86.4%)
Other	5 (3.5%)	2 (6.5%)	0 (0.0%)	2 (6.1%)	1 (0.6%)	8 (13.6%)
No. of Children Under 18 in Home						
1	14 (9.8%)	3 (9.7%)	1 (4.5%)	5 (15.2%)	18 (10.6%)	5 (8.5%)
2	74 (51.7%)	14 (45.2%)	13 (59.1%)	19 (57.6%)	96 (56.5%)	24 (40.7%)
3	42 (29.4%)	12 (38.7%)	6 (27.3%)	8 (24.2%)	45 (26.5%)	23 (39.0%)
4	10 (7.0%)	2 (6.5%)	2 (9.1%)	1 (3.0%)	11 (6.5%)	4 (6.8%)
5+	3 (2.1%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	3 (5.1%)
Caregiver Education						
Year 10	2 (1.4%)	0 (0.0%)	1 (4.5%)	2 (6.1%)	2 (1.2%)	3 (5.1%)
NSW High School Certificate or equiv.	6 (4.2%)	2 (6.5%)	1 (4.5%)	2 (6.1%)	6 (3.5%)	5 (8.5%)
TAFE Certificate	18 (12.6%)	6 (19.4%)	6 (27.3%)	3 (9.1%)	18 (10.6%)	15 (25.4%)
Bachelor’s degree	71 (49.7%)	15 (48.4%)	8 (36.4%)	20 (60.6%)	92 (54.1%)	22 (37.3%)
Postgraduate degree	41 (28.7%)	6 (19.4%)	6 (27.3%)	4 (12.1%)	45 (26.5%)	12 (20.3%)
Other	5 (3.5%)	2 (6.5%)	0 (0.0%)	2 (6.1%)	7 (4.1%)	2 (3.4%)
Marital Status						
Single	4 (2.8%)	2 (6.5%)	1 (4.5%)	2 (6.1%)	5 (2.9%)	4 (6.8%)
Divorced	3 (2.1%)	0 (0.0%)	1 (4.5%)	1 (3.0%)	3 (1.8%)	2 (3.4%)
Widowed	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
Married	122 (85.3%)	22 (71.0%)	14 (63.6%)	26 (78.8%)	140 (82.4%)	44 (74.6%)
Separated	5 (3.5%)	3 (9.7%)	1 (4.5%)	0 (0.0%)	7 (4.1%)	2 (3.4%)
De Facto	9 (6.3%)	4 (12.9%)	5 (22.7%)	4 (12.1%)	15 (8.8%)	7 (11.9%)
Two Parent Home						
Yes	130 (90.9%)	26 (83.9%)	19 (86.4%)	31 (93.9%)	153 (90.0%)	53 (89.8%)
No	13 (9.1%)	5 (16.1%)	3 (13.6%)	2 (6.1%)	17 (10.0%)	6 (10.2%)
Work Status						
Unemployed	4 (2.8%)	1 (3.2%)	1 (4.5%)	0 (0.0%)	4 (2.4%)	2 (3.4%)
Casual (1-15 hrs)	6 (4.2%)	2 (6.5%)	0 (0.0%)	5 (15.2%)	9 (5.3%)	4 (6.8%)
Part time (16-29 hrs)	58 (40.6%)	7 (22.6%)	9 (40.9%)	13 (39.4%)	68 (40.0%)	19 (32.2%)

Full time (30+ hrs)	49 (34.3%)	12 (38.7%)	6 (27.3%)	12 (36.4%)	65 (38.2%)	14 (23.7%)
Student	4 (2.8%)	0 (0.0%)	0 (0.0%)	1 (3.0%)	5 (2.9%)	0 (0.0%)
Retired	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
Extended Leave	2 (1.4%)	3 (9.7%)	0 (0.0%)	0 (0.0%)	3 (1.8%)	2 (3.4%)
Home Duties	19 (13.3%)	6 (19.4%)	5 (22.7%)	1 (3.0%)	15 (8.8%)	16 (27.1%)
Other	1 (0.7%)	0 (0.0%)	1 (4.5%)	1 (3.0%)	1 (0.6%)	2 (3.4%)
Annual Household Income						
Between AUD$10,000 - $30,000	3 (2.1%)	0 (0.0%)	1 (4.5%)	0 (0.0%)	2 (1.2%)	2 (3.4%)
Between AUD$31,000 - $45,000	4 (2.8%)	0 (0.0%)	0 (0.0%)	3 (9.1%)	3 (1.8%)	4 (6.8%)
Between AUD$46,000 - $65,000	10 (7.0%)	3 (9.7%)	3 (13.6%)	4 (12.1%)	15 (8.8%)	5 (8.5%)
Between AUD$66,000 – $95,000	13 (9.1%)	6 (19.4%)	0 (0.0%)	7 (21.2%)	13 (7.6%)	13 (22.0%)
Between AUD$96,000-$115,000	23 (16.1%)	5 (16.1%)	4 (18.2%)	5 (15.2%)	29 (17.1%)	8 (13.6%)
Between AUD$116,000-$150,000	30 (21.0%)	7 (22.6%)	3 (13.6%)	3 (9.1%)	33 (19.4%)	10 (16.9%)
Between AUD$151,000-$200,000	27 (18.9%)	6 (19.4%)	5 (22.7%)	4 (12.1%)	36 (21.2%)	6 (10.2%)
>AUD$200,001	33 (23.1%)	4 (12.9%)	6 (27.3%)	7 (21.2%)	39 (22.9%)	11 (18.6%)
Parent Mental Health History						
No	101 (70.6%)	13 (41.9%)	15 (68.2%)	13 (39.4%)	108 (63.5%)	34 (57.6%)
Yes	42 (29.4%)	18 (58.1%)	7 (31.8%)	20 (60.6%)	62 (36.5%)	25 (42.4%)
Child Developmental Concerns						
Yes	12 (8.4%)	8 (25.8%)	1 (4.5%)	8 (24.2%)	23 (13.5%)	6 (10.2%)
No	128 (89.5%)	22 (71.0%)	19 (86.4%)	23 (69.7%)	142 (83.5%)	50 (84.7%)
Not sure	3 (2.1%)	1 (3.2%)	2 (9.1%)	2 (6.1%)	5 (2.9%)	3 (5.1%)

Figure 5.1

Association Between Early Child Care Arrangements and Children's Outcomes Over Time Between Groups Based on Linear Mixed Model



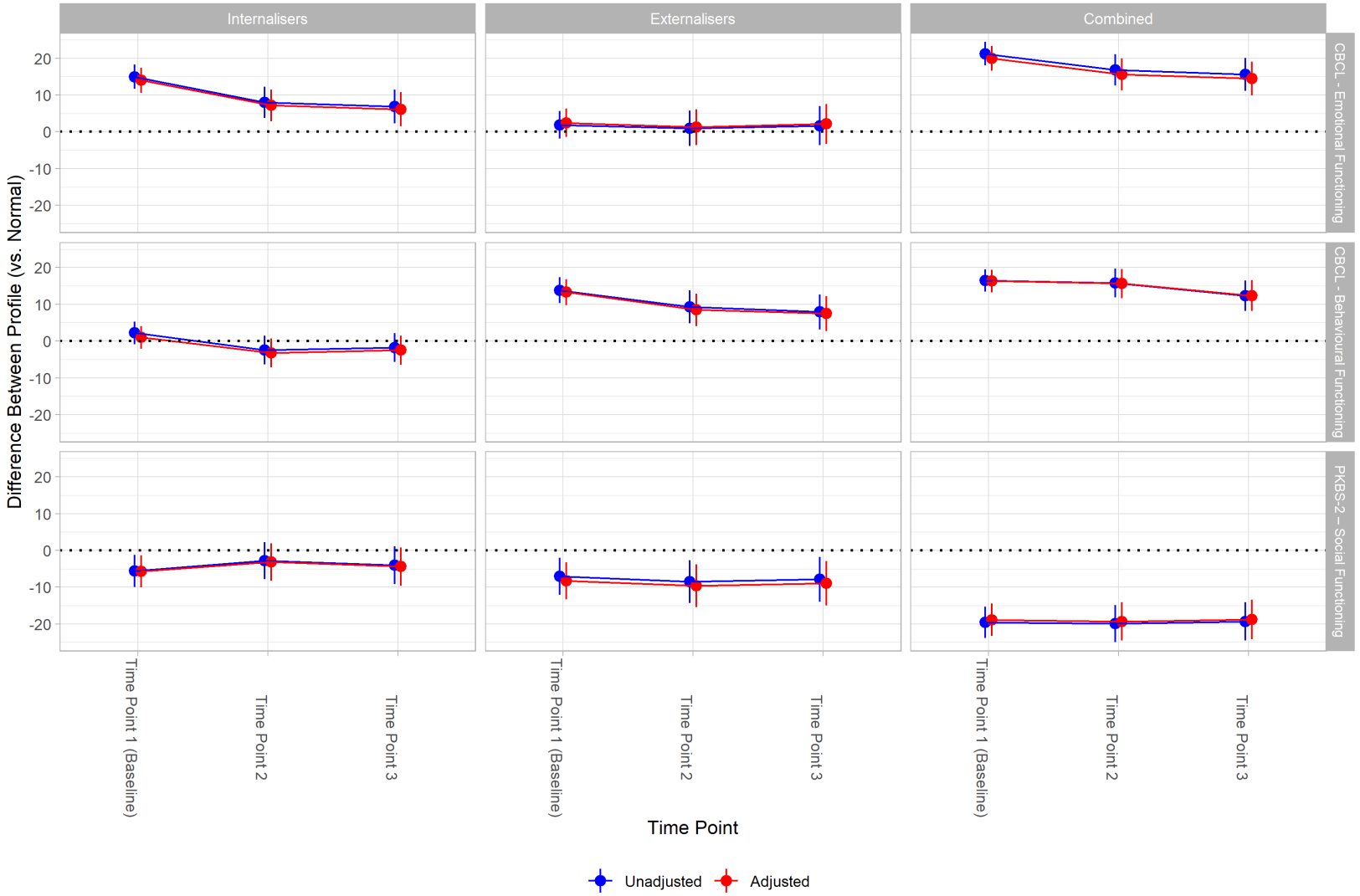
At time point 1, internalisers (*MD* = -5.58, 95% CI [-9.91, -1.24], *p* = 0.012, *Adjusted p* = .011) and externalisers (*MD* = -7.06, 95% CI [-12.1, -2.05], *p* = .006, *Adjusted p* = .001) had poorer social skills compared with the control group. Combined children also had poorer social skills compared with the control group, *MD* = -19.6, 95% CI [-23.8, -15.3], *p* < .001, *Adjusted p* <.001.

Research Question 2) Effect of ECCA Quality on Children's Social, Emotional and Behavioural Functioning.

A linear mixed model was used to estimate the association between ECCA quality and children's outcomes (see Figure 5.3). For children in formal care, there was a consistent, positive and significant association between ECCA quality and emotional functioning at time point 1 in both unadjusted (β = 0.54, 95% CI [0.12, 0.96], *p* = .012) and adjusted (β = 0.60, 95% CI [0.14, 1.06], *p* = .012) analyses, but no significant association at time points 2 (β = 0.24, 95% CI [-0.21, 0.68], *p* = .29) and 3 (β = 0.39 95% CI [-0.06, 0.83], *p* = .09). That is, as ECCA quality increased, estimation of their child's emotional functioning increased. Moreover, as ECCA quality decreased, estimation of their child's emotional functioning decreased. There was a consistent, positive and significant association between ECCA quality and behavioural functioning at all time points, whether the regression model was unadjusted or adjusted for potential confounders (see Appendix C, Table 5.8). That is, as ECCA quality increased, estimation of their child's behavioural functioning also increased. Moreover, ECCA quality decreased, estimation of their child's behavioural functioning also decreased. There was also a significant association between ECCA quality and social functioning at all time points, whether the regression model was unadjusted or adjusted for potential confounders (see Appendix C, Table 5.8). That is, as ECCA quality increased, child's social functioning also increased. In addition, as ECCA quality decreased, the child's social functioning also decreased.

Figure 5.2

Association Between Psychological Characteristics and Children's Outcomes Over Time Between Groups Based on Linear Mixed Model



Research Question 3) Effect of Home Environment Quality on Children's Social, Emotional and Behavioural Functioning.

A linear mixed model was used to estimate the association between home environment quality and children's outcomes (see Figure 5.3 and Appendix C, Table 5.9). At time point 3, there was a statistically significant, positive association between home environment quality and emotional functioning for children who attended informal care in the unadjusted (β = 0.88, 95% CI [0.11, 1.64], p = .025) analyses; however, this was no longer significant after adjusting for confounders (β = 0.75, 95% CI [-0.04, 1.53], p = .06). There was also a significant association at time point 1 between home environment quality and behavioural functioning for children in informal care in the unadjusted (β = 0.59, 95% CI [0.10, 1.08], p = .019) analyses; however, this was no longer significant after adjusting for confounders (β = 0.49, 95% CI [-0.08, 1.05], p = .09).

At time point 1, there was a significant, positive association between home environment quality and emotional functioning for children in formal care in the unadjusted and adjusted analyses (β = 0.43, 95% CI [0.18, 0.68], p < .001, *Adjusted p* = .001). That is, as home environment quality increased, child's emotional functioning also increased. Moreover, as home environment quality decreased, child's emotional functioning also decreased. There was also a significant association between home environment quality and emotional functioning for children in formal care at time point 2 in the unadjusted analysis (p = .043); however, this was no longer significant after adjusting for confounders (*Adjusted p* = .09).

There was a significant association between home environment quality and behavioural functioning for children who attended formal care at time points 1 (β = 0.56, 95% CI [0.33, 0.78], p < .001, *Adjusted p* < .001) and 2 (β = 0.43, 95% CI [0.17, 0.69], p = .002, *Adjusted p* = .001) in the unadjusted and adjusted analyses, such that as the home environment quality increased, the child's behavioural functioning also increased.

Additionally, as home environment quality decreased, the child's behavioural functioning also decreased.

Lastly, there was a significant association between home environment quality and social functioning for children who attended formal care at time points 1 (β = -0.71, 95% CI [-0.97, -0.45], $p < .001$, *Adjusted* $p < .001$), 2 (β = -0.59, 95% CI [-0.89, -0.30], $p < .001$, *Adjusted* $p < .001$) and 3 (β = -0.43, 95% CI [-0.76, -0.11], $p = .007$, *Adjusted* $p = .009$) in the unadjusted and adjusted analyses. That is, as home environment quality increased, the child's social functioning also increased. Also, as home environment quality decreased, the child's social functioning also decreased.

Research Question 4) Effect of Quantity of Formal Care Arrangements on Children's Social, Emotional and Behavioural Functioning.

A linear mixed model was used to estimate the association between the quantity of ECCA and children's outcomes (see Figure 5.4). For children in formal care, there was no statistically significant association between quantity of FCCA and behavioural functioning (see Appendix C, Table 5.13). There was a significant association between quantity of FCCA and emotional functioning, but only once an adjustment was made for potential confounding variables (β = 6.10, 95% CI [-0.11, 12.30], *Adjusted* $p = .05$). Children who attended a FCCA for ≥ 31 hours a week were associated with poorer emotional functioning at time point 2 compared to children who attended a FCCA for < 21 hours a week. There was also a significant association between quantity of FCCA and social functioning in both the unadjusted and adjusted analyses. Children who attended a FCCA for ≥ 31 hours a week were associated with poorer social functioning at time point 2 compared to children who attended a FCCA for < 21 hours a week (β = -6.80, 95% CI [-13.0, -0.62], $p = .031$, *Adjusted* $p = .008$). Additionally, children who attended a FCCA for ≥ 31 hours a week were associated with

poorer social functioning at time point 3 compared to children who attended a FCCA for < 21 hours a week (β = -6.48, 95% CI [-12.9, -0.11], p = .046, *Adjusted p* = .013).

Research Question 5) The Influence of Prior ECCAs and/or Psychological Characteristics on Social, Emotional and Behavioural Functioning During the Transitional Phase into Formal Schooling.

Differences in Scores Between Groups

ECCAs and Outcomes. A linear mixed model was used to estimate the association between ECCAs and child outcomes. At time point 2, there was no statistically significant mean difference between ECCAs and behavioural (p = .55) or social functioning scores (p = .87), as seen in Figure 5.1 and Appendix C, Table 5.2. There was no significant mean difference between ECCAs and emotional functioning at time point 2 in the unadjusted analysis (*MD* = 3.25, 95% CI [-0.82, 7.31], p = .12); however, there was a statistically significant mean difference in emotional functioning once an adjustment was made for potential confounding variables (*Adjusted p* = .023). That is, children who attended formal care had poorer emotional functioning when entering kindergarten compared to children who attended informal care.

Psychological Profiles and Outcomes. A linear mixed model was used to estimate the association between psychological profiles and child outcomes. At time point 2, internalisers (*MD* = 8.00, 95% CI [3.77,12.23], p < .001, *Adjusted p* = .001) and children in the combined group (*MD* = 16.83, 95% CI [12.62, 21.04], p <.001, *Adjusted p* <.001) had poorer emotional functioning than the control group, as seen in Figure 5.2 and Appendix C, Table 5.3. There was no statistically significant mean difference between externalisers and the control group on emotional functioning measures.

Figure 5.3

Association Between Home Environment Quality and ECCA Quality, and Children's Outcomes Based on Linear Mixed Model

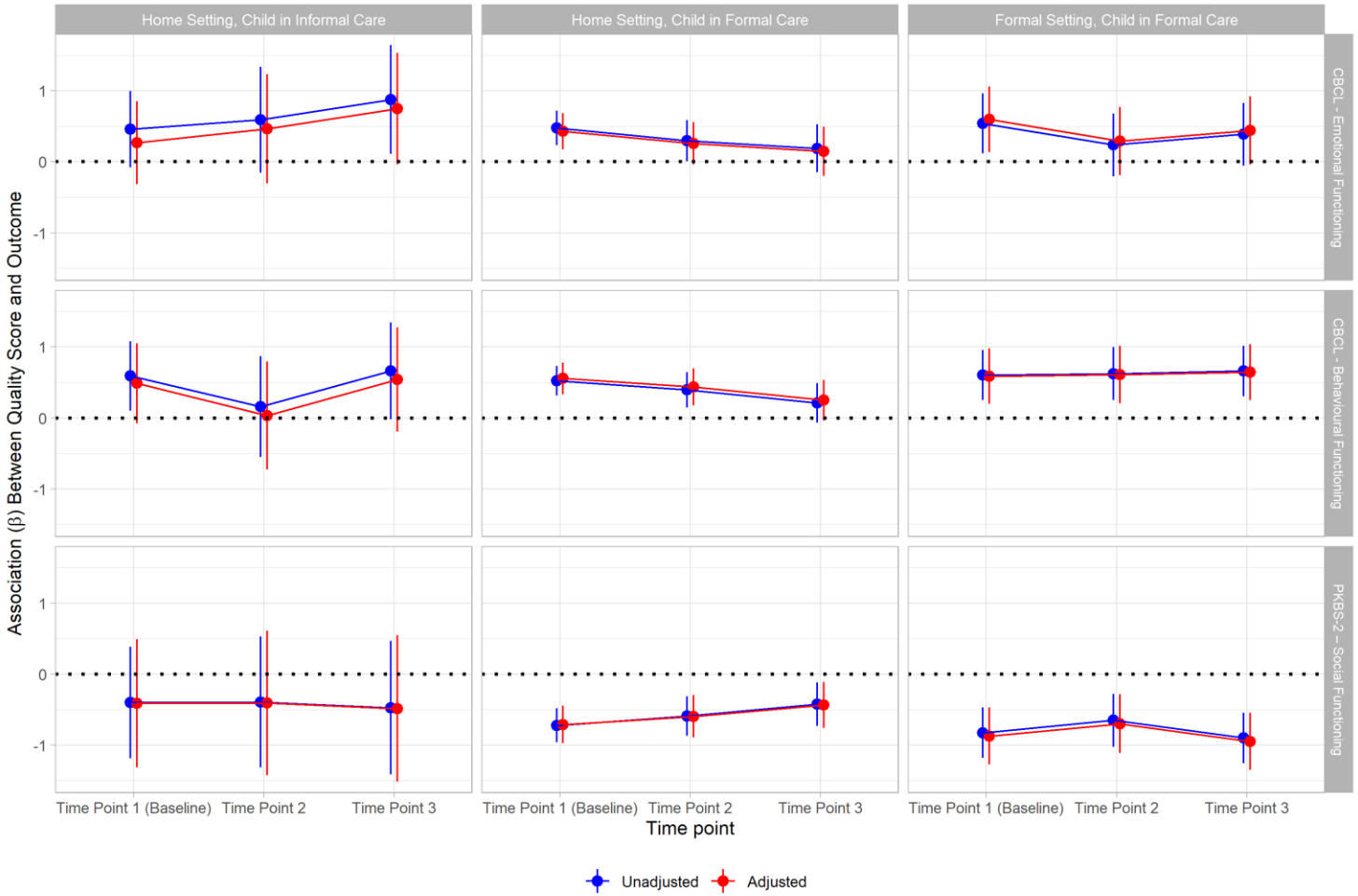
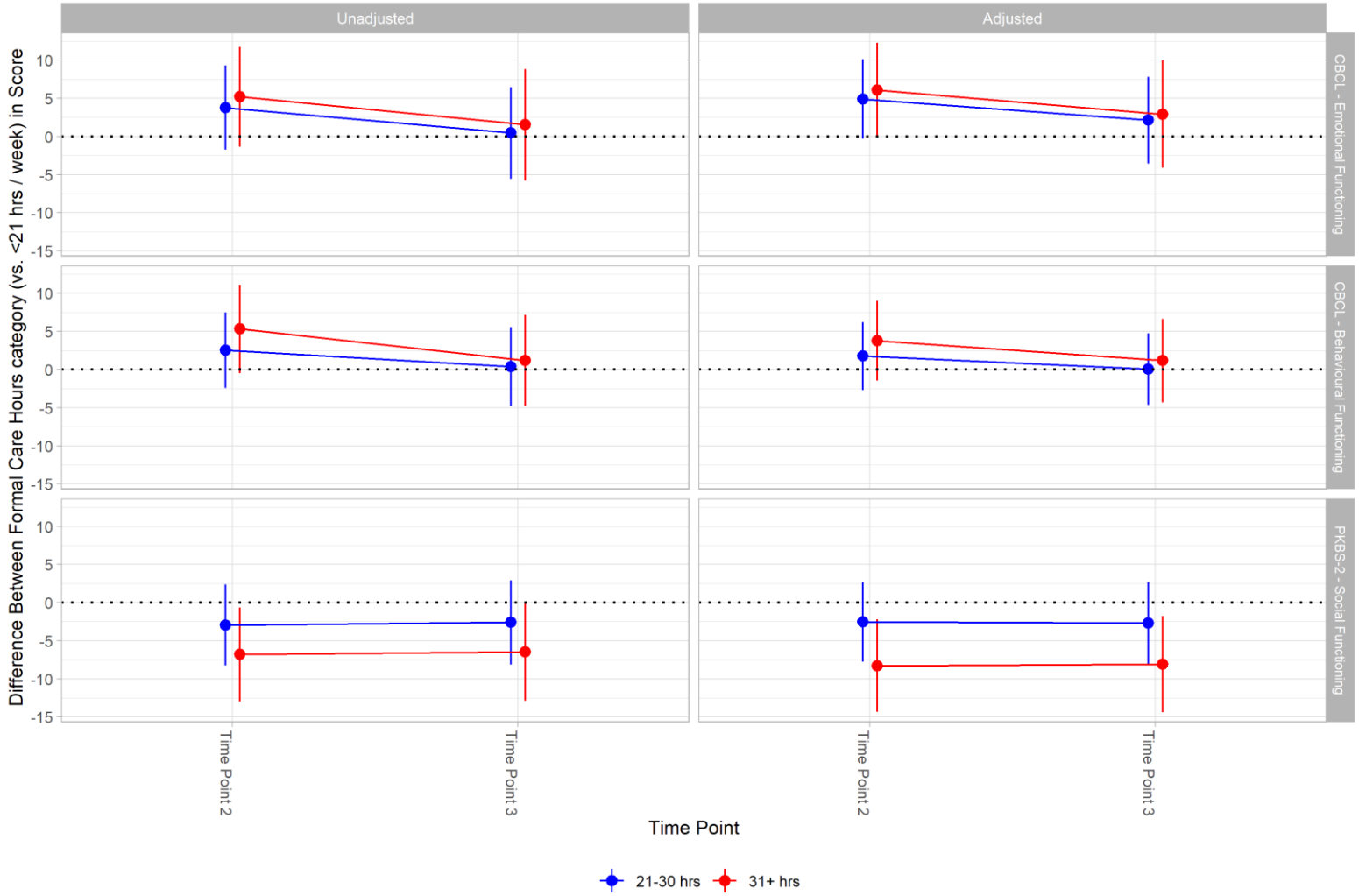


Figure 5.4

Association Between Quantity of Formal Care Arrangements and Children's Outcomes Based on Linear Mixed Model



Externalisers (*MD* = 9.32, 95% CI [4.85, 13.78], *p* <.001, *Adjusted p* < .001) and children in the combined group (*MD* = 15.82, 95% CI [11.89, 19.75], *p* <.001, *Adjusted p* <.001) were associated with poorer behavioural functioning compared to the control group. There was no statistically significant mean difference between internalisers and the control group on behavioural functioning measures.

Externalisers (*MD* = -8.51, 95% CI [-14.3, -2.70], *p* = 0.004, *Adjusted p* = 0.001) and combined children (MD = -19.9, 95% CI [-25.0, -14.9], *p* <.001, *Adjusted p* <.001) were associated with poorer social skills compared to the control group. There was no statistically significant mean difference between internalisers and the control group on social functioning measures.

Change From Baseline Data

ECCAs and Outcomes. A linear mixed model was used to estimate the association between ECCAs and child outcomes. There was no statistically significant difference in change from baseline in the emotional or behavioural functioning score at time point 2 between children who attended formal or informal care, with or without adjustment for potential confounders (see Figure 5.5 and Appendix C, Table 5.10). There was a statistically significant difference in change from baseline in the social functioning score at time point 2 for children who attended formal care, without adjustment for potential confounders ($\Delta\beta$ = -3.16, 95% CI [-6.39, 0.06], *p* = .05); however, this difference was not significant after adjusting for confounders, *Adjusted p* = .16.

Psychological Profiles and Outcomes. A linear mixed model was used to estimate the association between psychological profiles and child outcomes. For all children, regardless of psychological group, there was no statistically significant difference in change from baseline in the emotional functioning score at time point 2, with or without adjustment for potential confounders (see Figure 5.6, and Appendix C, Table 5.11). For internalisers,

there was no significant difference in change from baseline in behavioural functioning at time point 2 (Δβ = -3.77, 95% CI [-7.63, 0.09], p = .06), but there was a statistically significant improvement in behavioural functioning compared with baseline once an adjustment for potential confounding variables was made (Δβ = -3.79, 95% CI [-7.57, -0.01], p = .049). Externalisers' behavioural functioning did not differ from baseline at time point 2 (see Appendix C, Table 5.11). For combined children, there was a significant difference in change from baseline in behavioural functioning at time point 2 (Δβ = 5.63, 95% CI [0.51, 10.75], p = .032), but no significant difference in behavioural functioning compared with baseline once an adjustment for potential confounding variables was made, *Adjusted p* = .10. Internalisers' social functioning did not differ from baseline at time point 2 (see Appendix C, Table 5.11). For externalisers, there was a significant difference in change from baseline in social functioning at time point 2 (Δβ = -6.53, 95% CI [-12.6, -0.42], p = .036), and this difference remained significant after adjusting for potential confounding variables, *Adjusted p* = .047. That is, compared with the control group, externalisers were associated with poorer social functioning at time point 2. Combined children showed a significant difference in change from baseline in social functioning at time point 2 (Δβ = -18.9, 95% CI [-24.4, -13.4], p < .001); however, this was no longer significant after adjusting for potential confounding variables, *Adjusted p* = .06.

Interaction: Differences in the effect of care type according to psychological profile. Externalisers who attended informal care were associated with better behavioural functioning (Δβ = -5.06, 95% CI [-12.7, 2.56]) compared to externalisers who attended formal care (Δβ = 6.63, 95% CI [0.85, 12.41]) at time point 2; (p = .013) however, this was no longer significant after adjusting for potential confounding variables, *Adjusted p* = .08 (see Figure 5.7 and Appendix C, Table 5.12). Internalisers who attended formal care were associated with better emotional functioning (Δβ = -4.26, 95% CI [-10.3, 1.78]) compared to

internalisers who attended informal care (Δβ = 6.46, 95% CI [-2.17, 15.09]) at time point 2, (*Adjusted p* = .035), compared with baseline. Internalisers who attended formal care were associated with better behavioural functioning (Δβ = -6.10, 95% CI [-10.5, -1.71]) compared to internalisers who attended informal care (Δβ = 2.41, 95% CI [-4.77, 9.59]) at time point 2, (*Adjusted p* = .047), compared with baseline.

Research Question 6) The Influence of Prior ECCA and/or Psychological Characteristics on Social, Emotional and Behavioural Functioning After the Transitional Phase into Formal Schooling.

Difference Between Groups

ECCAs and Outcomes. A linear mixed model was used to estimate the association between ECCAs and child outcomes. At time point 3, there were no statistically significant mean differences between ECCAs and emotional (*p* = .93), behavioural (*p* = .60) or social functioning scores (*p* = .66), as seen in Figure 5.1 and Appendix C, Table 5.2.

Psychological Profiles and Outcomes. A linear mixed model was used to estimate the association between psychological profiles and child outcomes. At time point 3, internalisers (*MD* = 6.88, 95% CI [2.28, 11.47], *p* = .004, *Adjusted p* < .01) and combined children (*MD* = 15.60, 95% CI [11.13, 20.07], *p* <.001, *Adjusted p* <.001) were associated with poorer emotional functioning compared to the control group. There was no statistically significant mean difference between externalisers and the control group on emotional functioning measures (see Figure 5.2 and Appendix C, Table 5.3).

At time point 3, externalisers (*MD* = 7.91, 95% CI [3.14, 12.68], *p* = .001, *Adjusted p* = .002) and children in the combined group (*MD* = 12.28, 95% CI [8.16, 16.41], *p* <.001, *Adjusted p* <.001) were associated with poorer behavioural functioning compared to the control group. There was no statistically significant mean difference between internalisers and the control group on behavioural functioning measures.

Figure 5.5

Changes Between Early Child Care Arrangements and Children's Outcomes from Baseline Based on Linear Mixed Model

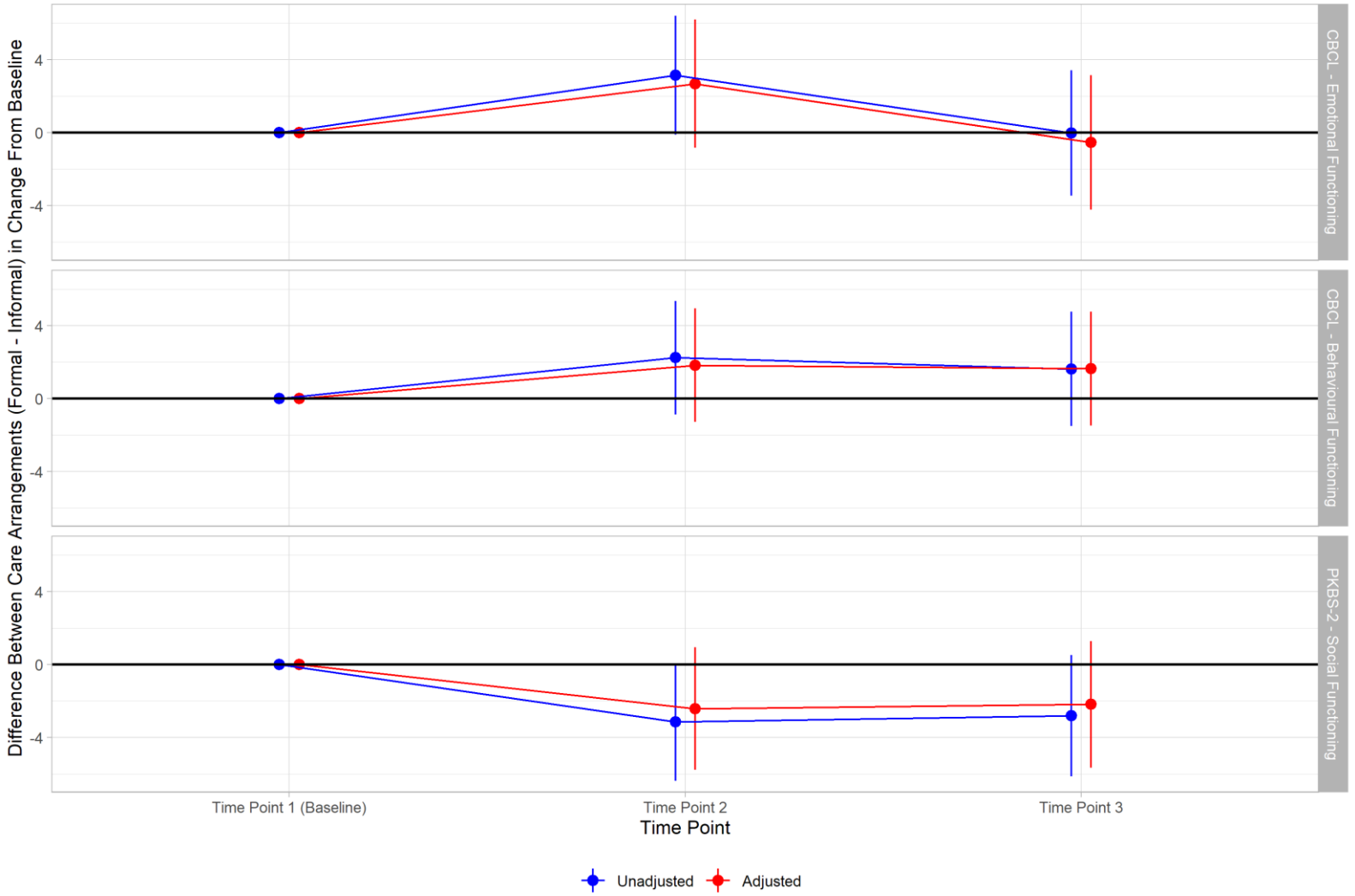


Figure 5.6

Changes Between Psychological Characteristics and Children's Outcomes from Baseline Based on Linear Mixed Model

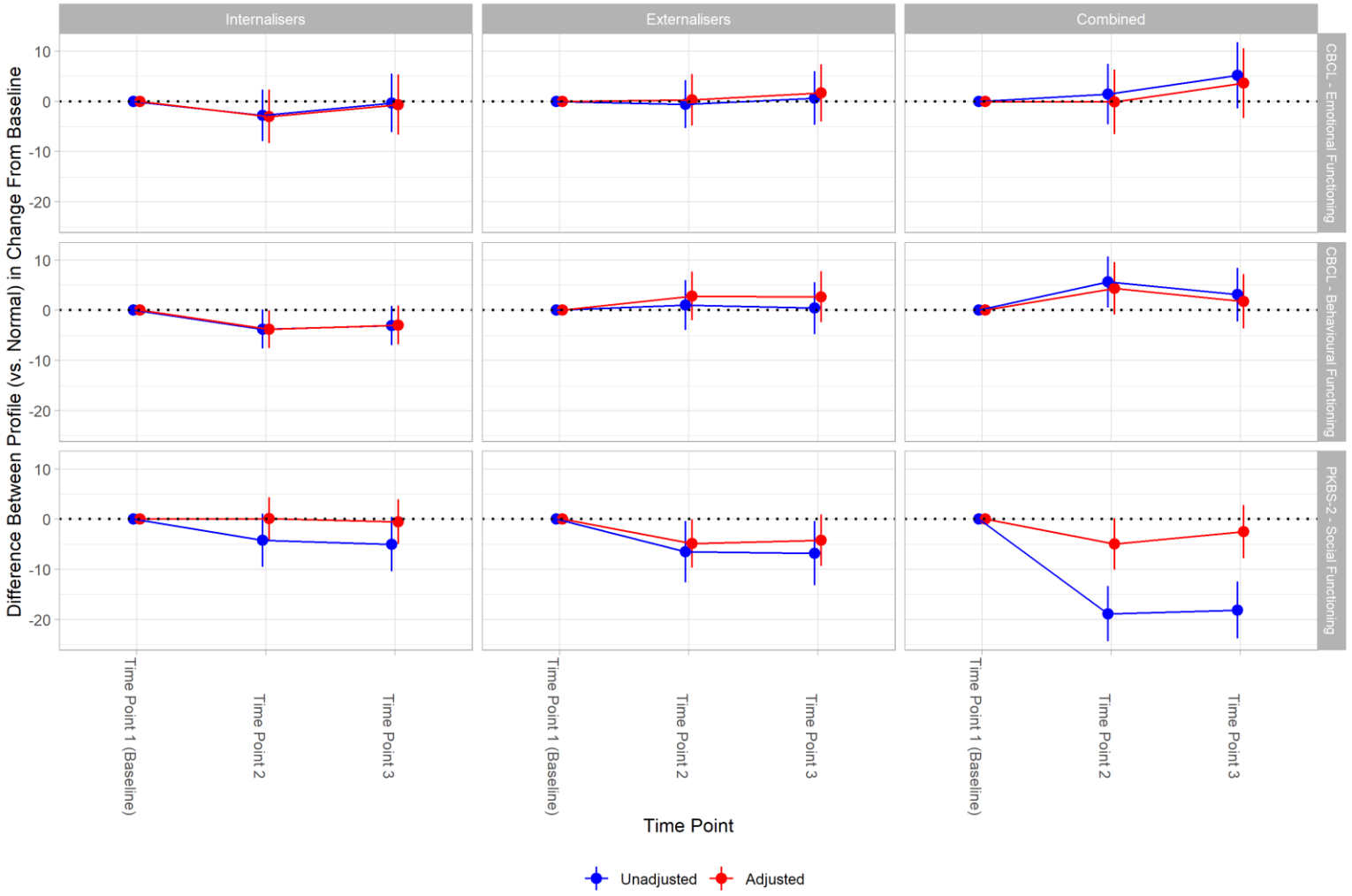
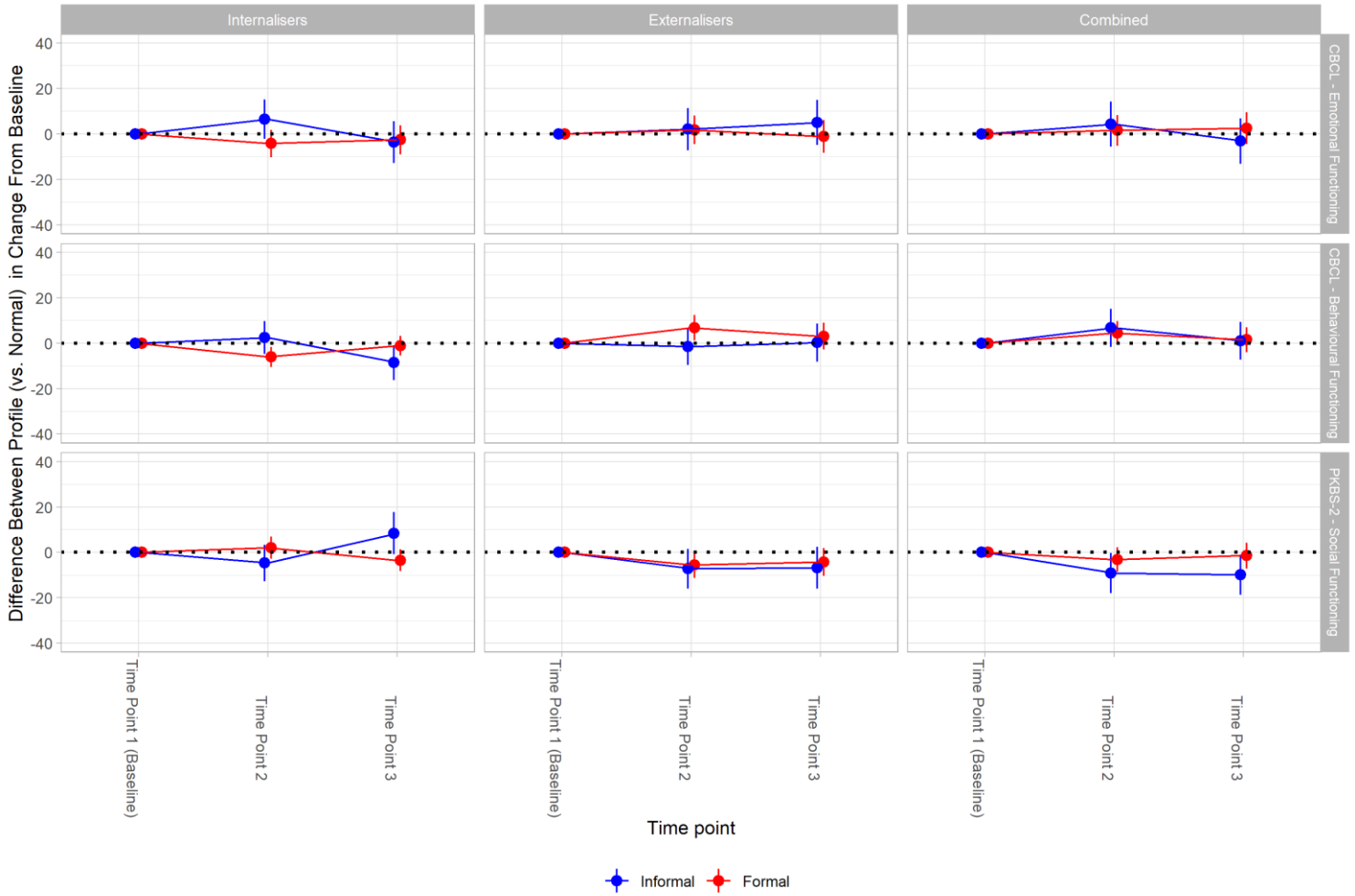


Figure 5.7

Interaction Between Psychological Characteristics, Early Child Care Arrangements and Children's Outcomes from Baseline Based on Linear Mixed Model



At time point 3, externalisers (*MD* = -7.86, 95% CI [-13.9, -1.79], *p* = .011, *Adjusted p* = .004) and combined children (*MD* = -19.3, 95% CI [-24.5, -14.1], *p* <.001, *Adjusted p* <.001) were associated with poorer social skills compared to the control group. There was no statistically significant mean difference between internalisers and the control group on social functioning measures.

Change From Baseline Data

ECCAs and Outcomes. A linear mixed model was used to estimate the association between ECCAs and child outcomes. There was no significant difference in change from baseline in the emotional, behavioural or social functioning score at time point 3 between children who attended formal or informal care, with or without adjustment for potential confounders (see Appendix C, Table 5.10). There was a significant overall difference in change from baseline throughout the whole study in the social functioning of children in informal care without adjustment for potential confounders (Δβ = -2.99, 95% CI [-5.77, -0.20], *p* = .036); however, this difference was not significant after adjusting for confounders, *Adjusted p* = .12.

Psychological Profiles and Outcomes. A linear mixed model was used to estimate the association between psychological profiles and child outcomes. For all children, regardless of psychological profile, there was no significant difference in change from baseline in the emotional or behavioural functioning score at time point 3, with or without adjustment for potential confounders (see Appendix C, Table 5.11). For internalisers, there was no significant difference in social functioning, compared with the control group, at time point 3 (see Appendix C, Table 5.11). There was a significant difference in the change from baseline in the social functioning score at time point 3 for externalisers (Δβ = -6.79, 95% CI [-13.2, -0.40], *p* = .038) and combined children (Δβ = -18.2, 95% CI [-23.8, -12.5], *p* = <.001), without adjustment for potential confounders; however, this difference was not

significant after adjusting for confounders, Externaliser *Adjusted p* = .11, Combined *Adjusted p* = .35.

There was a significant overall difference in change from baseline throughout the whole study in behavioural functioning for internalisers with and without adjustment for potential confounders (Δβ = -3.42, 95% CI [-6.59, -0.25], *p* = .034, *Adjusted p* = .033). There was also a significant overall difference in change from baseline throughout the whole study in behavioural functioning and social functioning for combined children without adjustment for potential confounders; however, this difference was not significant after adjusting for confounders (see Appendix C, Table 5.11). Externalisers showed a significant overall difference in change from baseline throughout the whole study in social functioning, with and without adjustment for potential confounders (see Appendix C, Table 5.11).

Interaction: Differences in the effect of care type according to psychological profile. There was some evidence that the effect of care type differed according to psychological profile over time (see Figure 5.7, and Appendix C, Table 5.12). Internalisers who attended informal care were associated with better social skills (Δβ = 9.89, 95% CI [0.83, 18.94]) compared to internalisers who attended formal care (Δβ = -1.98, 95% CI [-6.58, 2.63]) at time point 3 (*p* = .021, *Adjusted p* = .024), compared with baseline.

Data Provided by Teachers

A general linear model was used to estimate the association between ECCAs or psychological profiles and child outcomes. At time point 3, there was no statistically significant mean difference between children who attended formal or informal care on measures of teacher-reported emotional, behavioural or social functioning (see Figures 5.8 and 5.9, and Appendix C, Table 5.5).

In relation to psychological profile, teachers reported that the overall difference in emotional functioning decreased significantly for combined children, compared with children

in the control group, *MD* = 3.44, 95% CI [-5.67, 12.55], *p* = .017; however, this difference was not significant after adjusting for confounders, *Adjusted p* = .14. Teachers also reported that internalisers were associated with poorer emotional functioning compared to the control group (*MD* = 12.53, 95% CI [4.84, 20.21], *p* = .002, *Adjusted p* = .032)

Research Question 7) Relationship Between Disruptions Due to the COVID-19 Pandemic and a Child's Social, Emotional and Behavioural Outcomes at School.

A general linear model was used to estimate the association between disruptions caused by the COVID-19 pandemic and children's outcomes (see Figure 5.10 and Appendix C, Table 5.7). A significant association was found between the family subscale of the measure and children's outcomes. There was a significant association between family disruptions due to COVID-19 and behavioural functioning at time point 3, in both unadjusted (β = 0.68, 95% CI [0.05, 1.30], *p* = .034) and adjusted (β = 0.65, 95% CI [0.06, 1.24], *p* = .031) analyses. There was a significant association between family disruptions due to COVID-19 and emotional and social functioning scores, whether the regression model was unadjusted or adjusted for potential confounders (see Appendix C, Table 5.7).

Figure 5.8

Teacher Reported Association Between Psychological Characteristics and Children's Outcomes Over Time Between Groups Based on General Linear Model

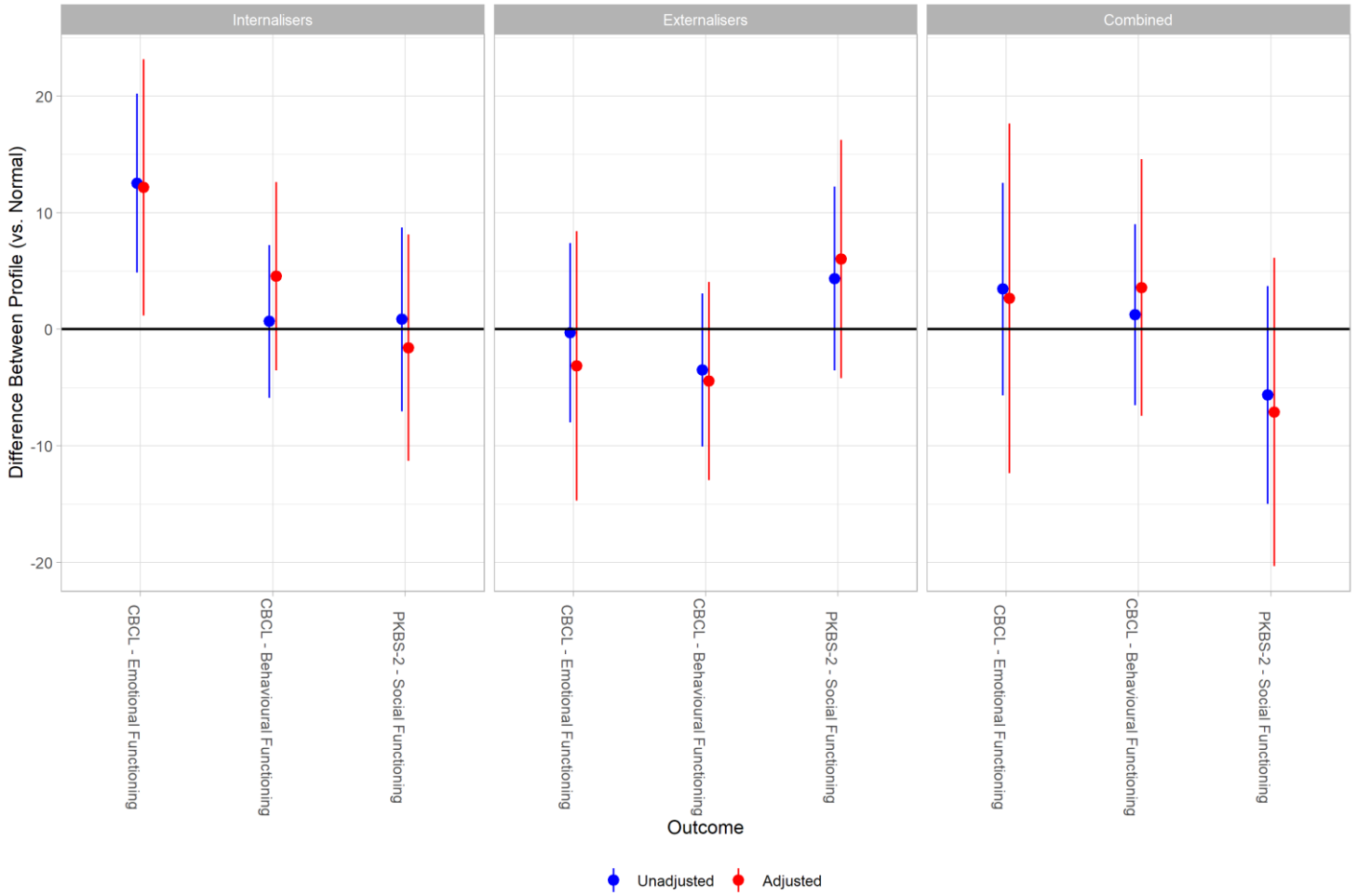


Figure 5.9

Teacher Reported Association Between Early Child Care Arrangements and Children's Outcomes Over Time Between Groups Based on General Linear Model

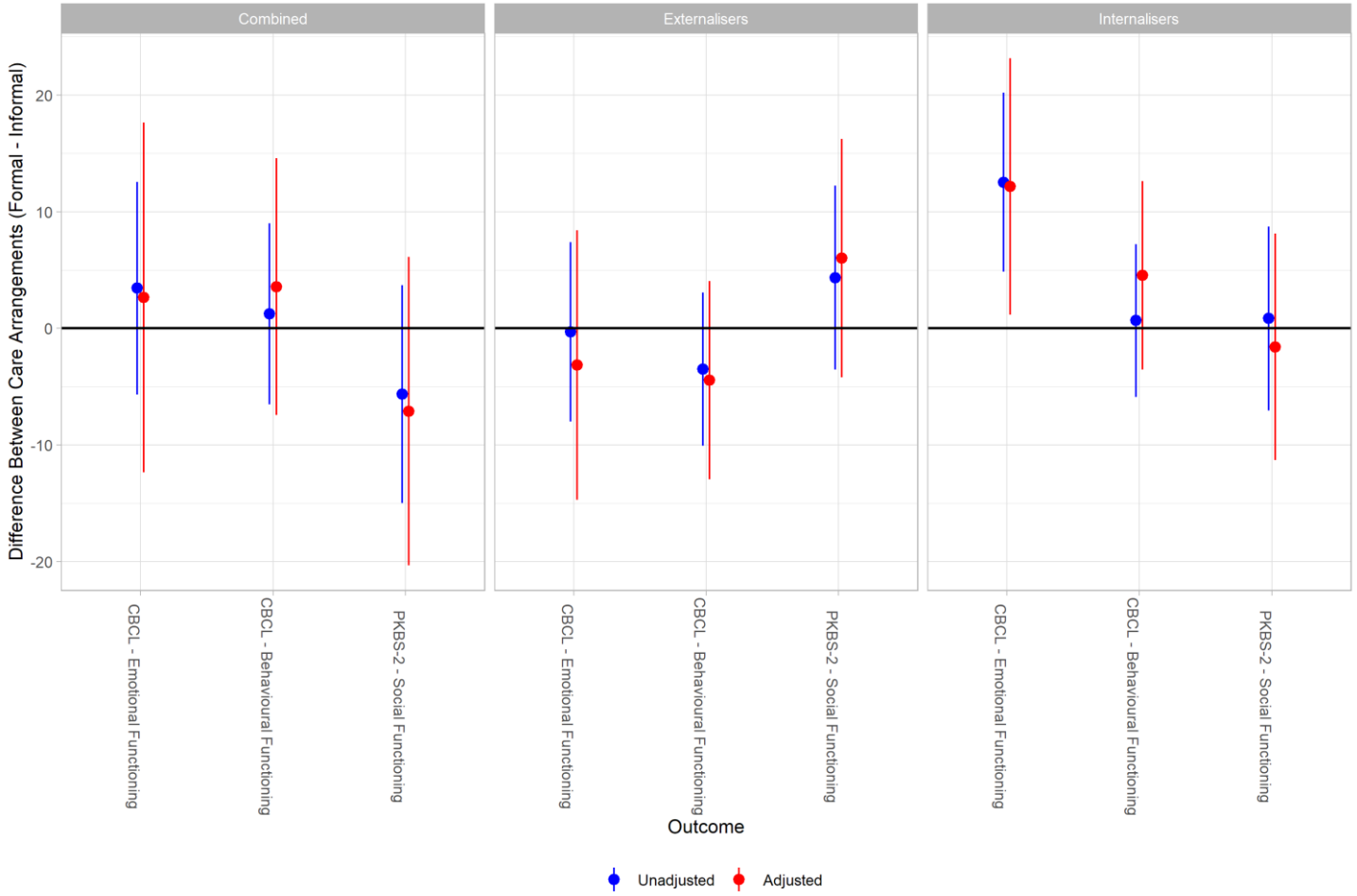
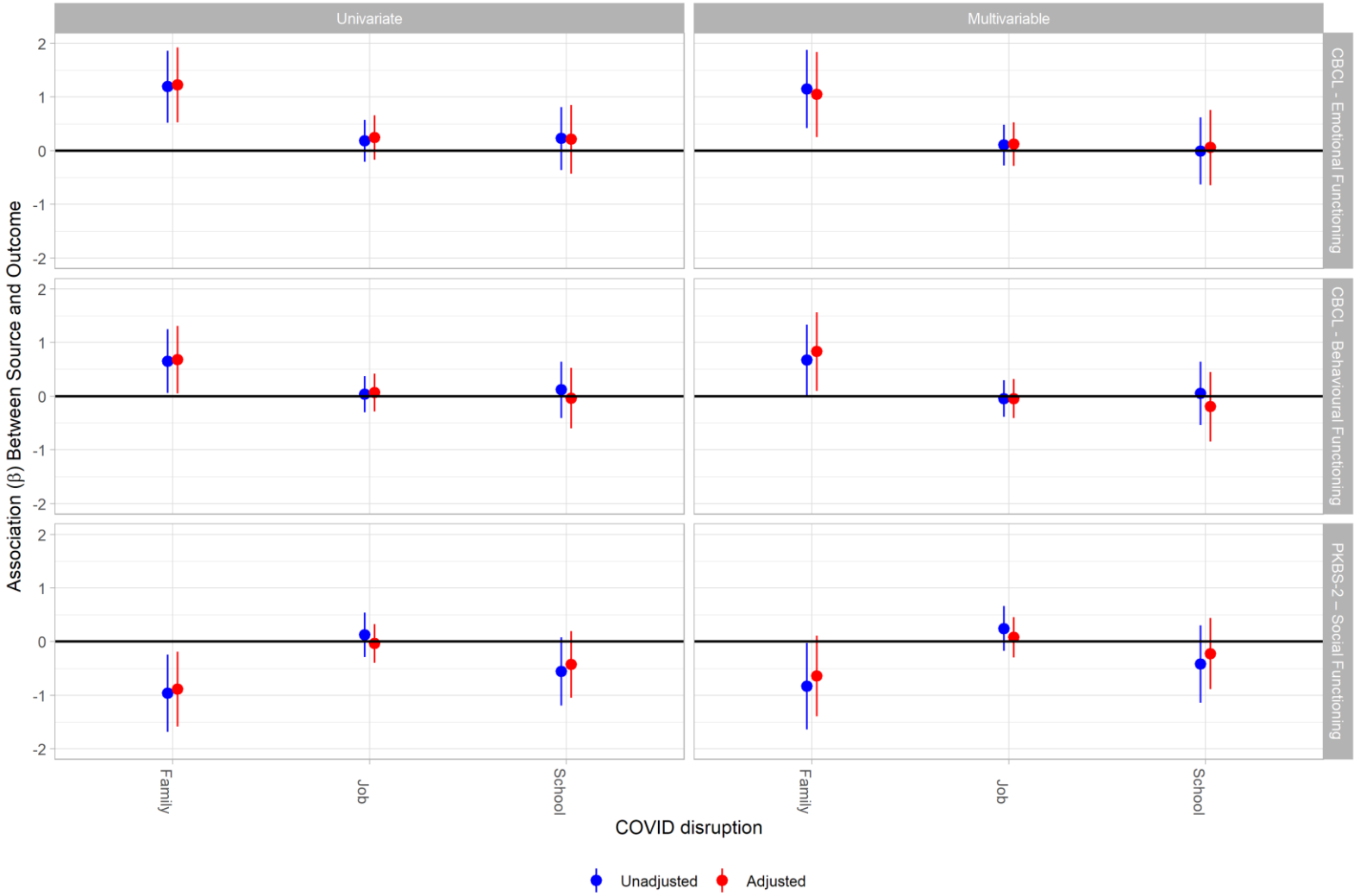


Figure 5.10

Association Between COVID-19 Disruptions and Children's Outcomes Based on General Linear Model



CHAPTER VI: DISCUSSION AND CONCLUSIONS

Thesis Overview

The overall aim of this research was to explore how attendance at different ECCAs influenced the social, emotional and behavioural outcomes of children with different psychological characteristics. Additionally, it aimed to examine how this affected a child's transition and adjustment to formal schooling. These research aims were investigated through a 12-month longitudinal cohort study design.

The first chapter introduced the context of this thesis. A narrative review was then undertaken (Chapter 2) in order to understand the social, emotional and behavioural characteristics of children who attended different ECCAs. This review also discussed the role that psychological characteristics play in the influence of ECCAs, and how these may impact a child's transition to school. Following this, a validation study was conducted (Chapter 3) which undertook a psychometric evaluation of a new self-report measure, the Home Observation Measurement of Environment Short-Form Questionnaire (HOME-SF-Q). The purpose of this self-report measure was to assess parents' perception of the quality of their home environment. Next, the same participants were asked, over three different time points, to complete an online questionnaire on their child's social, emotional and behavioural functioning, family and child characteristics (including psychological characteristics), demographic information, ECCA type, quantity and quality, and, due to the current pandemic, COVID-19 related questions (Chapter 4). The results and findings were presented in Chapter 5. This chapter (Chapter 6) summarises the key findings and interprets how they help to shed new light on the research questions posed by this dissertation. It also presents the clinical and policy implications of the research, the shortcomings of the methodology and suggestions for additional future research.

Key Findings

The HOME-SF-Q Validation Study.

This study aimed to develop and validate a reliable, concise, novel, 19-item self-report questionnaire to assess the quality of the home environment. The HOME-SF-Q's reliability was assessed using the Cronbach's alpha coefficient and the Cohen's kappa coefficient. Validity was examined via an exploratory factor analysis and compared with the factor structure reported for the original HOME-SF (Sugland et al., 1995).

The factors that emerged from the exploratory factor analysis were: *School Preparation, Physical Environment, Online Teaching and Education, No Physical Punishment, Engagement in Reading, Positive Parental Involvement, and Outdoor and Educational Outings.* Most items and factors in the HOME-SF-Q demonstrated acceptable to excellent alphas. However, the factors *Engagement in Reading* and *Positive Parental Involvement* had lower alpha values and should be interpreted with caution. The decision was made to obtain these factors as they contributed to content validity and had clinical value. These scales will be valuable in future studies examining school preparedness as well as parental quality. It is expected that these factors will be strengthened when more data are added in future research.

The results of the exploratory factor and reliability analyses showed that the HOME-SF-Q is psychometrically sound and can reliably assess the home environment of 4-6-year-old Australian children. It is hoped that it will be used in future research assessing home environment quality and safety, school preparedness, parent-child online teaching and education, physical punishment, parent-child reading engagement, parental involvement, and child outdoor and educational engagement.

Research Question 1. What is the effect of different types of early child care arrangements or psychological characteristics on children's social, emotional and behavioural

functioning?

Contrary to the first two hypotheses, there was no evidence that ECCA type influences children's emotional or behavioural functioning. Children who attended ICCAs showed higher social functioning than children who attended FCCAs; however, these effects were shown to be accounted for by other factors such as child gender. Therefore, regardless of whether a child attended formal or informal care, they showed similar social, emotional and behavioural outcomes. The analyses did, however, produce evidence that a child's psychological profile is associated with child outcomes in support of the third, fourth, and fifth hypotheses. Internalisers, externalisers and combined children were associated with poorer social skills in their ECCA, compared with the control group. Additionally, internalisers and combined children were associated with poorer emotional functioning, and externalisers and combined children were associated with poorer behavioural functioning, compared with the control group.

Some evidence indicated that the social skills of children in informal care were greater than those of children in formal care. This is consistent with findings reported by Ansari (2018), but in contrast to findings of an increase in social functioning with formal care attendance (Côté et al., 2007; Gormley Jr et al., 2011; Huston et al., 2015; Stein et al., 2013). In this thesis, confounding variables may have influenced the results. For instance, some children in informal care may have had two parents living in the household who had high education levels and no mental health history and thus may have been constantly engaging their children in conversation, which may have improved their social functioning (El Nokali et al., 2010; Havighurst et al., 2010). By contrast, children living with one parent who had lower education levels and poor mental health, and subsequently may not have engaged their children in many conversations, may have benefited from formal care. This might explain

why the association between ECCAs and social functioning can be better accounted for by confounding variables.

These results also suggest that ECCA type has less impact on a child than their psychological profile. These findings are in line with the research findings by Coplan et al. (2010), who reported a main effect of risk group but not care group. This reinforces the importance of considering a child's psychological profile when choosing an ECCA type. Children with externalising problems may have difficulty following instructions and controlling their impulses, regardless of which ECCA type they attend (Sezgin & Demiriz, 2019), while internalising children may be apprehensive and wary regardless of their ECCA type (Almas et al., 2011).

These findings contain many implications. If a child has any psychological difficulties, they may display poorer social skills compared to another child in the same child care arrangement without such difficulties. This finding complements previous studies that showed an association between other intrapersonal factors, such as child temperament, and pro-social child behaviour (Hipson & Séguin, 2016). If a child presents with covert problems such as anxiety or depression, they will exhibit poorer emotional outcomes than a child in the same child care arrangement who does not have these same characteristics. If a child's psychological profile is characterised by overt behaviours such as attention deficits or oppositionality, they, too, will express poorer behavioural functioning than another child in the same care arrangement without the same difficulties. Finally, these results confirm what other authors have reported (Coplan et al., 2010; Noordermeer et al., 2017; Rapee et al., 2013), which is that children with both covert and overt difficulties (i.e. combined children) have far greater social, emotional and behavioural challenges than their peers. Thus, this study contributes to the growing body of evidence that comorbidity of behavioural and

emotional disorders is linked to higher maladjustment than is a single diagnosis (Coplan et al., 2010; Noordermeer et al., 2017; Rapee et al., 2013).

Research Question 2. Does ECCA quality influence the effects of ECCAs or psychological characteristics on children's social, emotional and behavioural functioning?

As hypothesised, the results of this study show that from a parent's perspective, if a child attends a low-quality formal care arrangement, they will have poorer emotional functioning while in early care. However, once they have entered and settled into kindergarten, their emotional functioning will be no better or worse than that of a child who attended a high-quality formal care arrangement. Rudasill et al. (2016) suggest that these findings could be due to the low levels of emotional and instructional support in classrooms that are commonly seen in low-quality FCCAs. These themes were included in the current thesis's evaluation of low-quality care and therefore could provide support for this notion. However, it is important to note that a parent's perception of a FCCA and its actual quality may be different. Parents' perceptions still provide valuable information, as the viewpoint of the parent may affect factors such as parent-caregiver communication and caregiver warmth towards the child and family (Cleveland et al., 2013; Kensinger Rose & Elicker, 2008). In turn, these aspects then influence child emotional functioning (Cleveland et al., 2013; Kensinger Rose & Elicker, 2008). Furthermore, it seems that once a child has left this environment and commenced formal schooling, the effects of low-quality care on emotional development are not as relevant. This may be because the child then responds to the support offered in their new environment, rather than sustaining the effects from the previous care environment. Certainly, future research should assess the quality of the child's kindergarten classroom and compare it with the quality of the child's ECCA, in order to determine whether the former predominates in terms of its effects on child emotional functioning. Alternatively, these findings may be due to the parent's perception and not to the child, in reality, lacking

emotional regulation while attending their ECCA. Future studies could compare FCCA caregiver perception to parent perception of FCCA quality or use objective observers.

Also from the parent's perspective, if a child attends a low-quality formal care arrangement, they have associations with poorer behavioural and social functioning both while in care and once they have entered and settled into kindergarten, compared with a child who attends a high-quality formal care arrangement. This result is in support of the sixth hypothesis. These findings also echo those presented by Pluess and Belsky (2009), who found an association between low-quality care and more behaviour problems, and between high-quality care and greater social functioning. Pluess and Belsky (2009) indicated that this may be due to the higher levels of positive peer interaction and caregiver sensitivity found in high-quality care environments, as well as the reinforcement of positive social behaviour in such settings (Smidt, 2010). Additionally, previous findings have shown that parents are attentive to their child's developmental requirements when evaluating care arrangements (Gamble et al., 2009). It is noteworthy that parents may choose to enrol their child in a FCCA because they believe this environment will aid in the development of social skills and appropriate classroom behaviours (Gamble et al., 2009). This may be why parents rate their children as socially and behaviourally more competent if they have attended a high-quality arrangement.

Research Question 3. Does home environment quality influence the effects of ECCAs or psychological characteristics on children's social, emotional and behavioural functioning?

Overall, according to the results of this thesis, if a child is in informal care, high- or low-quality home environment is not associated with their social, emotional or behavioural well-being beyond the effects that are accounted for by other confounding variables. This result is contrary to the seventh hypothesis. Many factors influence a parent choosing informal over formal care. These factors include income, family structure and family

demographics (Liang et al., 2000). This project's results show that some of these factors influence home quality environment and children's outcomes. This finding may be reflective of the characteristics of informal care, which is less structured and less stringent regarding educational outcomes than formal care settings (Burger, 2010). It is possible that parents who choose informal care arrangements are less concerned about factors measured in the HOME-SF-Q, such as school preparation and online teaching and education. However, further research is needed to investigate the long-term effects of this relationship between home environment quality and informal care arrangements.

On the other hand, if a child is in formal care and the home environment is of high quality, the child is associated with better emotional functioning while in care, better behavioural functioning while in care and transitioning to kindergarten, and better social functioning while in care, while transitioning to kindergarten and after adjustment to kindergarten. This result supports the seventh hypothesis. These findings support previous findings by Pluess and Belsky (2010), who also found an association between parenting quality and social skills. As indicated in the seminal work by Bandura (1977), these positive relationships between a high-quality home environment and more optimal social, emotional and behavioural outcomes may be due to social learning theory. That is, when parenting quality is high, operationalised by parents' involvement in facilitating educational activities and lack of harsh punishment practices (Bradley & Corwyn, 2008; Bradley et al., 2001; Bradley et al., 2011; Sugland et al., 1995), then children will imitate these positive behaviours in other settings. Additionally, these findings may demonstrate that a parent perceives that a combination of high-quality home environment and attendance at centre care can provide children with a multitude of opportunities for stimulation, learning, teaching and enrichment (Bradley et al., 2011).

Research Question 4. Does the quantity of time spent in formal care arrangements impact

a child's social, emotional and behavioural functioning when transitioning and adjusting to formal schooling?

In support of the eighth hypothesis, children who attended a FCCA for more than 31 hours per week were associated with poorer social functioning when transitioning and adjusting to kindergarten compared to children who attended formal care for less than 21 hours a week. Ansari (2018) and NICHD ECCRN (2001a) also found that children who spend long periods of time in FCCAs present with undesirable social outcomes. One explanation is that spending long periods in group care can cause friction between children due to them competing for possessions and caregiver attention (Pesowski & Friedman, 2018). This undesirable social behaviour may then persist into the formal schooling experience. It is important to note that the current project could not differentiate between preschool programs that emphasise social development and other, less structured centre care. Future research should consider how different types of FCCAs impact children's social development.

The present study found that children who spent more time (>31 hours per week) in FCCAs were associated with poorer emotional functioning when transitioning into kindergarten compared to children who attended formal care for less than 21 hours a week, but this association was not observed in behavioural outcomes. Van Beijsterveldt et al. (2005) also found that more time spent in child care (i.e. 3.5 days per week) did not result in more problematic behaviour in their sample of children. However, by contrast, the authors reported that low and medium amounts of time spent in FCCAs were associated with greater externalising and internalising behaviour (Van Beijsterveldt et al., 2005). Longer periods in FCCAs may not influence behavioural outcomes, as negative expressions may be a result of adjustment to child care (Van Beijsterveldt et al., 2005). Once a child has become familiar with the FCCA, they may adjust well to the behavioural expectations placed on them by caregivers. Quantity of child care has been correlated with other factors such as the age of the

child when care was initiated (Vandell, 2004); this study ascertained that children enrolled in a FCCA before the age of one year showed less internalising behaviour than children enrolled after one years old (Broekhuizen et al., 2018). Future research assessing how ECCA quantity impacts child outcomes should consider the age of the child when they began attending child care arrangements. Additionally, future studies should consider how a combination of ECCA quantity *and* quality may together affect child outcomes.

Research Question 5. How is a child's social, emotional and behavioural functioning influenced by prior ECCA engagement and/or psychological characteristics during the transitional phase into formal schooling?

Children who attended formal care were associated with poorer emotional functioning when entering kindergarten, compared with children who attended informal care. This result was also seen in a study by Harrison (2008), who found that children who were cared for by a relative, friend or nanny, rather than in centre-based care, displayed better emotional functioning. This might imply that one-on-one care or care by close family can help to prevent the emotional dysregulation that can occur in bigger group (Côté et al., 2008; Harrison, 2008).

A child's psychological profile was significantly associated with their outcomes during the transition phase into kindergarten. The data suggested that externalisers and combined children had poorer social skills than the control group; internalisers and combined children had poorer emotional functioning than the control group; and externalisers and combined children had poorer behavioural functioning than the control group. However, internalisers' behavioural functioning when entering kindergarten was better than their emotional functioning while in ECCAs. This improvement in behavioural functioning in internalising children may be due to the routine and structure offered by formal schooling, which such children prefer (Sezgin & Demiriz, 2019). Alternatively, it is not uncommon for

children in Australia to refer to kindergarten as “big school”(Kearns, 2016). An anxious child may also view kindergarten as a time of growth, so they may feel more comfortable and courageous transitioning into kindergarten than they did in early care arrangements.

Contrary of the ninth hypothesis, this study found that internalising children who attended formal care were associated with better emotional and behavioural functioning when entering kindergarten compared to internalising children who attended informal care. These are unexpected findings, as it has been previously reported that internalising children find centre care to be anxiety-provoking (Bassett et al., 2017; Coplan et al., 2010), meaning that one would expect such children to show better emotional and behavioural functioning in informal care. This conflict in findings could be because anxious children who spend time in formal care become attuned to structured group environments, and therefore are already somewhat habituated to this type of situation by the time they start kindergarten (Kendall et al., 2005). By contrast, children who have been cared for at home by their parent may struggle more to adapt to the new environment when they start kindergarten. Furthermore, an anxious child may have learnt from their FCCA experience that group environments offer positive outcomes, such as friendships and relationships with caregivers. Therefore, once it comes to transitioning into kindergarten, they feel more positive about the experience. There were no significant interactions between a child’s psychological profile and type of ECCA on social outcomes, rejecting the 10th hypothesis.

Research Question 6. How is a child’s social, emotional and behavioural functioning influenced by prior ECCA engagement and/or psychological characteristics beyond the transitional phase, i.e., the adjustment phase, into formal schooling?

The results of this study show that, regardless of whether a child had previously attended a FCCA or ICCA, parents rated their children as having similar social, emotional and behavioural functioning once they had adjusted to kindergarten. Likewise, teachers did

not report that children who had attended formal or informal care showed differences in their emotional, behavioural or social functioning. Previous research has shown that children eventually catch up with each other in their development of social, emotional and behavioural skills, which may explain why there are no prolonged effects of ECCA type on child functioning once a child has spent a considerable time in kindergarten (Côté et al., 2007; Howes et al., 1992; McCutcheon & Calhoun, 1976). Generally speaking, young children are adaptive (Masten & Barnes, 2018), and so once the initial transition into kindergarten has passed, they may well settle into their new environment. In terms of how a child's psychological profile influences their outcomes while they are adjusting to kindergarten, the data suggested that internalising and combined children were associated with poorer emotional functioning. Teachers also rated internalising children as having poorer emotional functioning compared to the control group. Moreover, externalisers and combined children were associated with poorer behavioural and social functioning compared to children in the control group. These findings are consistent with those presented by Coplan et al. (2010), who found that children classified as aggressive were more aggressive than anxious children two years later, while anxious and combined children were more anxious than aggressive children two years later. The start of school can be a tumultuous time for many children and may exacerbate the difficulties experienced by both internalising and externalising children (Coplan et al., 2010; Grills & Ollendick, 2002; Storch & Masia-Warner, 2004). As previously discussed, these results also lend support to the literature that has found that having a comorbidity of behavioural and emotional disorders is related to a higher level of maladjustment than is a single diagnosis (Coplan et al., 2010; Noordermeer et al., 2017; Rapee et al., 2013).

Rejecting the 11th hypothesis, internalisers who had attended informal care were associated with better social skills when adjusting to kindergarten compared to internalisers

who had attended formal care. Although one would expect that early exposure to peers would increase a child's social skills, this does not appear to be the case. It is conceivable that the presence of a large peer group, together with higher child-adult ratios, may lead internalising children to further withdraw, resulting in lack of social development (Coplan et al., 2010; Coplan & Arbeau, 2008). Future research should consider which aspects of informal care may impact on an internalising child's social functioning, since variables such as teacher-child relationships may be more influential than the FCCA itself. If an anxious child is experiencing conflict and does not feel comfortable approaching a caregiver, they may then find it difficult to resolve any resulting social issues (Rudasill et al., 2016). There were no significant interactions between a child's psychological profile and type of ECCA on emotional and behavioural outcomes, rejecting the 12th hypothesis.

Research Question 7. Is there a correlation between disruptions due to the pandemic (i.e. home, work, school) and a child's social, emotional and behavioural outcomes at school?

This research was undertaken during the COVID-19 global pandemic, and this is bound to have impacted the results. Parents reported that they believed that only the family disruptions caused by COVID-19 had made an impact on their child's social, emotional and behavioural functioning, which partially supports the 13th hypothesis. They did not believe that disruptions to their child's schooling experience or their own job experience had impacted their child's well-being. Parents who reported greater family disruptions due to COVID-19 rated their child's social, emotional and behavioural functioning as poorer, compared with that of children whose parents who reported fewer family disruptions.

Families who had experienced fewer disruptions tended to be those who had maintained routine and structure in their day-to-day lives, and who had been able to stay connected not only as a family but also with friends. This type of interconnectedness, and the support provided by familial relationships, promotes resilience in children, who then

functions well psychologically and behaviourally (Prime et al., 2020). Furthermore, family routines foster family cohesion and predictability, which are especially important at a time of uncertainty and unpredictability (Ferretti & Bub, 2017). Children who were less affected by family disruptions also had access to outdoor space and played outside. Outdoor play encourages exercise, exploration and expression, and has been linked to many physical and psychological health benefits (Flannigan & Dietze, 2017). Among these benefits are a reduction in stress and an increase in self-regulation through activation of the five senses, which in turn provokes a mindful state (Hanscom, 2016).

Interestingly, disruptions to learning and to parents' jobs did not affect children's social, emotional and behavioural functioning. At kindergarten level, the learning process requires creative and skilled educators (Champeaux et al., 2020). It may be that our sample of mainly well-educated parents was better equipped to help their children with home learning, despite in some cases possibly having lost their jobs and experiencing financial stress and instability, which have previously been associated with poor child emotional functioning (Larsen et al., 2021). Preliminary research examining these factors has suggested that older children are more affected than younger children by their parents' job instability, due to the child's heightened awareness of their emotional reactions (Larsen et al., 2021). Older children are also more likely to experience emotional frustration as a result of school closures, due to their greater reliance on peer relationships, whereas younger children are more reliant on their family than their friends (Larsen et al., 2021).

Implications of the Research

Previous research examining the effects of ECCAs on child development has predominantly focused on a public health or education perspective. This thesis draws on the Australian context to provide a psychological perspective on the current literature. Of importance, therefore, are findings which can provide insight into the patterns of children's

different psychological profiles and how they are influenced by their care arrangements. This thesis explored this interaction while a child was in early care and after they had experienced their next major developmental milestone, attending kindergarten.

Implications for Policies

Children's well-being and development are prioritised in both government and ECCA policy documents. Research and funding constantly support and shape the way early care is provided to children (OECD, 2013). One of the international organisations seeking to create better early care policies is the Organisation for Economic Co-operation and Development (OECD). The OECD has highlighted the need for professional development of ECCA teachers and caregivers as a key policy issue (OECD, 2013). This is an issue of increasing concern for policymakers, with the OECD stressing the importance of improving the quality of teachers and supporting the diverse needs of Australian children (OECD, 2013). The results of this research suggest that preschool caregivers need to be well educated and trained in mental health issues in order to be able to support internalising and/or externalising children in centre-based care (Williford & Shelton, 2008). This is because the quality of care there can influence social, emotional and behavioural functioning not only while children are attending an ECCA, but also a year later, when they are in formal schooling.

The Australian federal government has implemented the National Early Childhood Development Strategy, with the aim of building a more effective national early childhood development system (OECD, 2013). The strategy has six priority areas, including providing support for vulnerable children (OECD, 2013). This thesis shows that children with psychological and/or behavioural challenges continue to experience these difficulties in ECCAs. These findings support a shift in focus to the provision of specific support for children with psychological and behavioural challenges. According to Kessler et al. (2005), half of mental health conditions emerge by the age of 14, and early prevention and

intervention are the most effective ways to prevent mental health issues from emerging and escalating (Australian Institute of Health and Welfare, 2021; Thorley, 2016).

Clinical Implications

This thesis investigated the impact of ECCAs on children with varied psychological profiles. Some child care characteristics proved beneficial for children with internalising traits. Of particular importance, internalising children were associated with better emotional and behavioural functioning during the transition period into formal schooling if they had attended formal care arrangements. As the main concern in relation to internalising children is their emotional regulation skills (Crawford et al., 2011; Wang et al., 2018), this result of the study indicates that an internalising child is better suited to formal early care. When parents are unable to enrol their child in formal care, perhaps due to financial difficulties (Gamble et al., 2009), it is important for them to know that some other form of exposure to peer groups and caregivers outside the home could be beneficial for their children. This can be achieved through, for example, sports activities and playgroups. These results also suggest that exposure techniques used by clinical psychologists could help such children to become accustomed to peer groups and other caregivers before entering formal schooling.

The benefit and risk factors of ECCA attendance were less clear for externalising and combined children. In this study, externalising children struggled with social and behavioural functioning throughout their time in an ECCA, and this continued into their formal schooling experience. Children classified as combined, with both internalising and externalising characteristics, had the same experience, although – unlike externalisers – they also struggled with emotional functioning. There was some indication that externalising children who attended informal care had better behavioural functioning when entering kindergarten, but these effects were shown to be accounted for by factors such as socio-economic status, the number of parents within the household and parent mental health history.

Although externalising children may be better suited to informal care, it may be that more support for such children and their parents is also important. Children who are more aggressive in centre-based care may have been placed there by parents because of the challenges of handling their behaviour at home (NICHD ECCRN, 2003b). In such cases, the vulnerability of externalising and combined children pre-dates the child care arrangement, and both the child and parent would benefit from earlier mental health intervention and parental support, rather than the child simply being placed in a specific ECCA.

Lastly, it is important to consider the quantity and quality of formal care arrangements, as well as the quality of the home care environment, and how these influence child outcomes. In this study, higher-quality centre-based care was associated with better children's functioning across the board, while the opposite was true of low-quality formal care. Additionally, low levels of time spent in formal care showed better social and emotional child outcomes than high levels. These results suggest that attending a high-quality care arrangement for less time may lead to better outcomes for children than attending low-quality child care for a longer period. This again indicates the potential benefits of exposing internalising children to peer groups and caregivers outside the home, but perhaps for shorter periods so that they are not overwhelmed. Furthermore, high-quality home environments were associated with better overall functioning for children who attended formal care. This insight helps to fill the gap in knowledge about whether the home environment or the ECCA environment is more beneficial for a child; however, it also supports the notion that better-quality environments in both cases support children socially, emotionally and behaviourally. This information can help clinical psychologists, who assess children across different contexts, to identify the pros and cons of both their home and ECCA and devise a treatment plan.

Limitations of the Research

It is important to acknowledge the limitations of this research. The first limitation lies in the HOME-SF-Q Validation Study. It is usually best practice to compare a novel measure to other well known, valid and reliable measures that assess the same or similar constructs (convergent validity). Unfortunately, that was unable to be conducted in the current project due to the limited availability of other home environment quality questionnaires because of cost, access, or length. These challenges are also what prompted the need for this new HOME-SF-Q. Additionally, the current study had limited funding and was unable to access available home environment quality questionnaires. Therefore, a comparison with the factor structure of the HOME-SF's observational measures factor structure was deemed the best option.

Secondly, although self-report measures are valid and reliable, they do have limitations. All of the parental information provided for the data collection was obtained from the parents of young children, and thus relied on the parent's perception of themselves, their child, their home environment and their child's ECCA environment. Use of unbiased observers would usually be preferable in a longitudinal study; however, in this case that would have been too expensive and time-consuming, so self-report questionnaires were chosen. These did permit collection of a larger dataset than may have been obtained using observational measures. Although the accuracy of data may be somewhat compromised when self-report measures are used, they give insights into the parent's perception of their child's situation, which is important, as it will impact their parenting and their child's behaviour. Additionally, the assurance of confidentiality may have prompted more honest responses.

Thirdly, the small sample of teacher data at time points 2 and 3, and the lack of ECCA caregiver data at time point one, limit the power of the analysis. As seen from the teacher data analysed at time point 3, they tell a different story from the data provided by parents.

Including multiple informants in any study enhances the reliability with which results can be assessed and interpreted (Alexander et al., 2017). The inclusion of ECCA caregiver data at time point one would have strengthened this thesis, as it might have improved the accuracy with which children were assigned to specific psychological profile categories. The limited sample size at time points 2 and 3 was partly due to the COVID-19 pandemic. Unfortunately, private and Catholic schools halted ethics applications, which meant it was not possible to seek approval to ask teachers to complete the online study. Additionally, throughout various stages of the data collection process, teachers were at home, conducting online learning. This meant they had extra work pressures, with less capacity to complete an optional online study.

The results reported in this thesis were considered statistically significant when p values were .05 or less. However, statistical significance does not necessarily equate to clinical significance. The children in this study were classified into their psychological profile based on clinically significant levels of internalising symptomology, externalising symptomology, or both internalising and externalising symptomology, and therefore presentation of statistical significance was deemed appropriate. Moreover, use of statistical significance to interpret findings is a well-established approach in studies of developmental and clinical psychology.

Future Research Directions

This thesis has explored how psychological characteristics interact with ECCAs to impact children's outcomes. However, there remain possible areas for future research that could make a major contribution to the knowledge base. Further research could incorporate longer-term monitoring of outcomes to determine whether impacts persist beyond the early years of formal schooling. In this study, the impacts of ECCA type continued to be seen when a child was transitioning into formal schooling, but were no longer evident at the end of their first year of kindergarten. It would be valuable to ascertain whether these effects are still

visible in the later years of primary school. Future studies would benefit from including children enrolled in later school years and from having multi-informant data at all time points.

Parent-reported data were collected at all time points, and although this study attempted to obtain data from teachers at two of the three time points, sufficient data were collected only at the third time point. The teachers provided a different set of data and held a different view on students from that of parents. Although this is to be expected, as discussed in chapter 2, multi-informant data should come from caregivers in different contexts. Understanding the contexts in which children display different internalising and externalising behaviours may assist clinical psychologists in tailoring advice and treatment for such children.

Researchers should continue to explore family and home characteristics that constitute risk or protective factors for internalising and externalising children. Future consideration of the interaction between ECCAs and psychological characteristics should include a deeper exploration of other factors that can influence child development, such as parental mental health, attachment, access to resources and child temperament (Cummins & McMaster, 2006; Hipson & Séguin, 2016; Keltner et al., 2014; Niklas et al., 2017; O'Connor et al., 2012). These child and parental factors affect parents' subjectivity and well-being. Given that the current study relied on parent-provided data through an online questionnaire, an understanding of how parents' ratings are shaped by these factors is very important. In this sense, the availability of more accurate observational data would also improve future investigations.

A more detailed, comprehensive review of other aspects of ECCAs warrants future research. One of these aspects is the stability of the ECCA experience. As mentioned in chapter 2, moving between different centre-based care arrangements may have a destabilising

effect on a child, and this can inhibit them from creating peer friendships and relationships with caregivers in these environments (Côté et al., 2008). There is also the reality that, even with relative stability, children are likely to experience more than one type of care. Future studies should consider not only formal and informal care, but the combined effects of more than one care type on children's outcomes. Finally, previous research has reported that the age of a child's entry into care is a moderating variable, and influences how ECCAs affect children's social, emotional and behavioural functioning (Broekhuizen et al., 2018; Vandell, 2004). It will be important for future studies to consider how the longevity of the ECCA experience impacts children with differing psychological characteristics.

Conclusions

In conclusion, this thesis provides evidence for a new understanding of how early child care arrangements and psychological characteristics influence child social, emotional and behavioural outcomes. It also provides new knowledge about how children then transition and adjust to kindergarten. The findings reveal that ECCA type has less of an effect on child than their own psychological characteristics.

Overall in this study, internalising children continued to show emotional functioning difficulties throughout their ECCA and formal schooling experience. They also exhibited social skills deficits while in ECCAs. Externalising children exhibited both behavioural and social functioning difficulties throughout their ECCA and formal schooling experience. Combined children found the entire experience most difficult overall, as they experienced social, emotional and behavioural functioning deficits throughout their ECCA and formal schooling experience. Internalising children showed better emotional and behavioural functioning if they had attended formal care but showed better social functioning if they had attended informal care.

The quality and quantity of care arrangements had a significant impact on children's outcomes. As expected, higher quality of and shorter time periods in formal care arrangements were associated with better social, emotional and behavioural functioning. The validation study added a brief but valid and reliable questionnaire, the HOME-SF-Q, suitable for use in future research studies to assess home environment quality. The results of this validated self-report questionnaire indicated that a high-quality home environment impacted children in formal care arrangements more than those in informal care arrangements. Not surprisingly, a high-quality home environment was associated with better social, emotional and behavioural functioning than a low-quality home environment.

Despite the identified analytical and statistical limitations, the findings from this research are useful and can be applied more broadly. These results can be used to support revisions to government policy and improvements to clinical practice guidelines relating to children's experiences in early care. Specifically, the findings can help to identify the strengths and weaknesses of different children attending different ECCA types, which can assist in the planning of treatment for 4–6-year-old children. However, future research that extends the longitudinal literature by incorporating more time points and supplementary multi-informant data, and by exploring additional ECCA and familial characteristics, would strengthen the conclusions made in this thesis.

References

Abreu-Lima, I. M. P. (2009). Quality of home environment and development of children: A study using 'HOME' Inventory. *Psicologia: Revista da Associação Portuguesa Psicologia, 23*(2), 115-128. https://doi.org/10.17575/rpsicol.v23i2.331

Abry, T., Latham, S., Bassok, D., & LoCasale-Crouch, J. (2015). Preschool and kindergarten teachers' beliefs about early school competencies: Misalignment matters for kindergarten adjustment. *Early Childhood Research Quarterly, 31*(1), 78-88. https://doi.org/10.1016/j.ecresq.2015.01.001

Achenbach, T. M. (1991). *Integrative guide for the 1991 CBCL/4-18, YSR, and TRF profiles*. Department of Psychiatry, University of Vermont.

Achenbach, T. M., & Edelbrock, C. S. (1981). Behavioral problems and competencies reported by parents of normal and disturbed children aged four through sixteen. *Monographs of the Society for Research in Child Development, 46*, 1-82.

Achenbach, T. M., & Rescorla, L. A. (2000). *Manual for the ASEBA preschool forms and profiles* (Vol. 30). University of Vermont, Research Center for Children, Youth and Families.

Achenbach, T. M., & Ruffle, T. M. (2000). The Child Behavior Checklist and related forms for assessing behavioral/emotional problems and competencies. *Pediatrics in Review, 21*(8), 265-271. https://doi.org/10.1542/pir.21-8-265

Achenback, T., & Rescorla, L. (2001). *Manual for the ASEBA school-age forms & profiles*. University of Vermont Research Centre for Children, Youth and Families.

Ahun, M. N., Consoli, A., Pingault, J.-B., Falissard, B., Battaglia, M., Boivin, M., Tremblay, R. E., & Côté, S. M. (2018). Maternal depression symptoms and internalising problems in the offspring: the role of maternal and family factors. *European Child & Adolescent Psychiatry, 27*(7), 921-932. https://doi.org/10.1007/s00787-017-1096-6

Ainsworth, M. S., & Bowlby, J. (1991). An ethological approach to personality development. *American Psychologist, 46*(4), 333-341.

Alegre, A. (2011). Parenting styles and children's emotional intelligence: What do we know? *The Family Journal, 19*(1), 56-62. https://doi.org/10.1177/1066480710387486

Alexander, L. A., McKnight, P. E., Disabato, D. J., & Kashdan, T. B. (2017). When and how to use multiple informants to improve clinical assessments. *Journal of Psychopathology and Behavioral Assessment, 39*(4), 669-679. https://doi.org/10.1007/s10862-017-9607-9

Allen, D., & Fraser, B. J. (2002). *Parent and student perceptions of the classroom learning environment and its influence on student outcomes* [Paper presented at the annual meeting of the American Educational Research Association].

Almas, A. N., Degnan, K. A., Fox, N. A., Phillips, D. A., Henderson, H. A., Moas, O. L., & Hane, A. A. (2011). The relations between infant negative reactivity, non‐maternal childcare, and children's interactions with familiar and unfamiliar peers. *Social Development, 20*(4), 718-740. https://doi.org/10.1111/j.1467-9507.2011.00605.x

Andreassen, C., & Fletcher, P. (2007). Early Childhood Longitudinal Study, Birth Cohort (ECLS-B): Psychometric Report for the 2-Year Data Collection. Methodology Report. NCES 2007-084. *National Center for Education Statistics*.

Ansari, A. (2018). The persistence of preschool effects from early childhood through adolescence. *Journal of Educational Psychology, 110*(7), 952-973. https://doi.org/10.1037/edu0000255

Ansari, A., & Pianta, R. C. (2018). Variation in the long-term benefits of child care: The role of classroom quality in elementary school. *Developmental Psychology, 54*(10), 1854–1867. https://doi.org/10.1037/dev0000513

Arace, A., Scarzello, D., Zonca, P., & Agostini, P. (2019). Early child care experiences and individual differences: the role of gender and temperament in social skills and problem behaviours in Italian toddlers. *Early Child Development and Care, 191*(6), 1-13. https://doi.org/10.1080/03004430.2019.1655736

Australian Bureau of Statistics. (2016). *2016 Census QuickStats*. https://quickstats.censusdata.abs.gov.au/census_services/getproduct/census/2016/quickstat/036

Australian Bureau of Statistics. (2017). *Preschool Education, Australia* (cat. no. 4240.0). ABS. http://www.abs.gov.au/ausstats/abs@.nsf/mf/4240.0

Australian Bureau of Statistics. (2020). *Labour Force Status of Families*. https://www.abs.gov.au/statistics/labour/employment-and-unemployment/labour-force-status-families/latest-release#data-download

Australian Children's Education and Care Quality Authority. (2018). *National Quality Standard*. https://www.acecqa.gov.au/sites/default/files/2018-07/RevisedNQSHandoutA4.pdf

Australian Institute of Family Studies. (2005). *Growing up in Australia: The Longitudinal Study of Australian Children 2004 Annual Report*. Australian Institute of Family Studies. https://growingupinaustralia.gov.au/sites/default/files/annualreport2004.pdf

Australian Institute of Family Studies. (2020). *Families in Australia Survey: Life During COVID-19 Report no.1: Preliminary Findings*. https://aifs.gov.au/sites/default/files/publication-documents/covid-19-survey-report_1_early_findings_0.pdf

Australian Institute of Health and Welfare. (2021). *Australia's youth: Mental illness*. https://www.aihw.gov.au/reports/children-youth/mental-illness

Baker, M., & Milligan, K. (2010). Evidence from maternity leave expansions of the impact of maternal care on early child development. *Journal of Human Resources, 45*(1), 1-32.

Bandura, A. (1977). *Social learning theory* (Vol. 1). Prentice Hall: Englewood Cliffs.

Bandura, A. (1978). Social learning theory of aggression. *Journal of Communication, 28*(3), 12-29. https://doi.org/10.1111/j.1460-2466.1978.tb01621.x

Bandura, A., Ross, D., & Ross, S. A. (1961). Transmission of aggression through imitation of aggressive models. *The Journal of Abnormal and Social Psychology, 63*(3), 575-582.

Barbarin, O. A., Early, D., Clifford, R., Bryant, D., Frome, P., Burchinal, M., Howes, C., & Pianta, R. (2008). Parental conceptions of school readiness: Relation to ethnicity, socioeconomic status, and children's skills. *Early Education and Development, 19*(5), 671-701. https://doi.org/1080/10409280802375257

Bassett, H. H., Denham, S. A., Fettig, N. B., Curby, T. W., Mohtasham, M., & Austin, N. (2017). Temperament in the classroom: Children low in surgency are more sensitive to teachers' reactions to emotions. *International Journal of Behavioral Development, 41*(1), 4-14. https://doi.org/10.1177/0165025416644077

Baumrind, D. (1966). Effects of authoritative parental control on child behavior. *Child Development, 37*(4), 887-907. https://doi.org/10.2307/1126611

Bayer, J. K., Ukoumunne, O. C., Mathers, M., Wake, M., Abdi, N., & Hiscock, H. (2012). Development of children's internalising and externalising problems from infancy to five years of age. *Australian & New Zealand Journal of Psychiatry, 46*(7), 659-668. https://doi.org/10.1177/0004867412450076

Behrendt, H. F., Wade, M., Bayet, L., Nelson, C. A., & Enlow, M. B. (2020). Pathways to social-emotional functioning in the preschool period: The role of child temperament and maternal anxiety in boys and girls. *Development and Psychopathology, 32*(3), 961-974. https://doi.org/10.1017/S0954579419000853

Beijers, R., Riksen-Walraven, M., Putnam, S., de Jong, M., & de Weerth, C. (2013). Early non-parental care and toddler behaviour problems: Links with temperamental negative affectivity and inhibitory control. *Early Childhood Research Quarterly, 28*(4), 714-722. https://doi.org/10.1016/j.ecresq.2013.06.002

Belsky, J. (2006). Early child care and early child development: Major findings of the NICHD study of early child care. *European Journal of Developmental Psychology, 3*(1), 95-110. https://doi.org/10.1080/17405620600557755

Belsky, J. (2013). Differential susceptibility to environmental influences. *International Journal of Child Care and Education Policy, 7*(2), 15-31. https://doi.org/10.1007/2288-6729-7-2-15

Belsky, J., Bakermans-Kranenburg, M. J., & Van IJzendoorn, M. H. (2007). For better and for worse: Differential susceptibility to environmental influences. *Current Directions in Psychological Science, 16*(6), 300-304. https://doi.org/10.1111/j.1467-8721.2007.00525.x

Belsky, J., & Pluess, M. (2012). Differential susceptibility to long-term effects of quality of child care on externalizing behavior in adolescence? *International Journal of Behavioral Development, 36*(1), 2-10. https://doi.org/10.1177/0165025411406855

Belsky, J., & Pluess, M. (2013). Genetic moderation of early child‐care effects on social functioning across childhood: A developmental analysis. *Child Development, 84*(4), 1209-1225. https://doi.org/10.1111/cdev.12058

Bernier, A., Beauchamp, M. H., Carlson, S. M., & Lalonde, G. (2015). A secure base from which to regulate: Attachment security in toddlerhood as a predictor of executive functioning at school entry. *Developmental Psychology, 51*(9), 1177-1189.

Bierman, K. L., & Motamedi, M. (2015). Social-Emotional Learning Programs for Preschool Children. In J. Durlak, C. Domitrovich, a. R. P. Weissberg, & T. Gullotta (Eds.), *The*

handbook of social and emotional learning: Research and practice (pp. 135-150). The Guildford Press.

Black, M. M., Walker, S. P., Fernald, L. C., Andersen, C. T., DiGirolamo, A. M., Lu, C., McCoy, D. C., Fink, G., Shawar, Y. R., & Shiffman, J. (2017). Early childhood development coming of age: Science through the life course. *The Lancet, 389*(10064), 77-90. https://doi.org/10.1016/S0140-6736(16)31389-7

Blair, K. A., Denham, S. A., Kochanoff, A., & Whipple, B. (2004). Playing it cool: Temperament, emotion regulation, and social behavior in preschoolers. *Journal of School Psychology, 42*(6), 419-443. https://doi.org/10.1016/j.jsp.2004.10.002

Blewitt, C., Morris, H., O'Connor, A., Ifanti, A., Greenwood, D., & Skouteris, H. (2021). Social and emotional learning in early childhood education and care: A public health perspective. *Australian and New Zealand Journal of Public Health, 45*(1), 17-19. https://doi.org/10.1111/1753-6405.13058

Boon, H. J. (2007). Low‐and high‐achieving Australian secondary school students: Their parenting, motivations and academic achievement. *Australian Psychologist, 42*(3), 212-225. https://doi.org/10.1080/00050060701405584

Bosc, M. (2000). Assessment of social functioning in depression. *Comprehensive Psychiatry, 41*(1), 63-69. https://doi.org/10.1016/S0010-440X(00)90133-0

Bowlby, J. (1982a). *Attachment and loss. Vol. 1: Attachment* (2nd ed.). Basic Books.

Bowlby, J. (1982b). Attachment and loss: Retrospect and prospect. *American Journal of Orthopsychiatry, 52*(4), 664-678. https://doi.org/10.1111/j.1939-0025.1982.tb01456.x

Bradley, R. H., Caldwell, B. M., Rock, S. L., Hamrick, H. M., & Harris, P. (1988). Home observation for measurement of the environment: Development of a home inventory for use with families having children 6 to 10 years old. *Contemporary Educational Psychology, 13*(1), 58-71. https://doi.org/10.1016/0361-476X(88)90006-9

Bradley, R. H., & Corwyn, R. F. (2008). Infant temperament, parenting, and externalizing behavior in first grade: A test of the differential susceptibility hypothesis. *Journal of Child Psychology and Psychiatry, 49*(2), 124-131. https://doi.org/10.1111/j.1469-7610.2007.01829.x

Bradley, R. H., Corwyn, R. F., Burchinal, M., McAdoo, H. P., & García Coll, C. (2001). The home environments of children in the United States Part II: Relations with behavioral development through age thirteen. *Child Development, 72*(6), 1868-1886. https://doi.org/10.1111/1467-8624.t01-1-00383

Bradley, R. H., McKelvey, L. M., & Whiteside‐Mansell, L. (2011). Does the quality of stimulation and support in the home environment moderate the effect of early education programs? *Child Development, 82*(6), 2110-2122. https://doi.org/10.1111/j.1467-8624.2011.01659.x

Brady, M. (2018). The role of informal childcare in mothers' experiences of care and employment: A qualitative lifecourse analysis. In L. Bernardi & D. Mortelmans (Eds.), *Lone Parenthood in the Life Course* (Vol. 8, pp. 237-255). Springer. https://doi.org/10.1007/978-3-319-63295-7

Bratsch-Hines, M. E., Mokrova, I., Vernon-Feagans, L., & Family Life Project Key Investigators. (2015). Child care instability from 6 to 36 months and the social adjustment of children in prekindergarten. *Early Childhood Research Quarterly, 30*, 106-116. https://doi.org/10.1016/j.ecresq.2014.09.002

Bratsch-Hines, M. E., & Vernon-Feagans, L. (2013). Child care changes, home environment quality, and the social competence of African American children at age 3. *Early Education and Development, 24*(8), 1065-1081. https://doi.org/10.1080/10409289.2013.736359

Britto, P. R., Lye, S. J., Proulx, K., Yousafzai, A. K., Matthews, S. G., Vaivada, T., Perez-Escamilla, R., Rao, N., Ip, P., & Fernald, L. C. (2017). Nurturing care: Promoting early childhood development. *The Lancet, 389*(10064), 91-102. https://doi.org/10.1016/S0140-6736(16)31390-3

Broekhuizen, M. L., van Aken, M. A., Dubas, J. S., & Leseman, P. P. (2018). Child care quality and Dutch 2-and 3-year-olds' socio-emotional outcomes: Does the amount of care matter? *Infant and Child Development, 27*(1), e2043, Article e2043. https://doi.org/10.1002/icd.2043

Bronfenbrenner, U. (1977). Toward an experimental ecology of human development. *American Psychologist, 32*(7), 513-531. https://doi.org/10.1037/0003-066X.32.7.513

Bronfenbrenner, U. (1992). Ecological systems theory. In R. Vasta (Ed.), *Six theories of child development: Revised formulations and current issues* (pp. 187-249). Jessica Kingsley Publishers.

Bronfenbrenner, U. (1996). *The ecology of human development: Experiments by nature and design*. Harvard University Press.

Burger, K. (2010). How does early childhood care and education affect cognitive development? An international review of the effects of early interventions for children from different social backgrounds. *Early Childhood Research Quarterly, 25*, 140-165. https://doi.org/10.1016/j.ecresq.2009.11.001

Burns, M. K., Warmbold-Brann, K., & Zaslofsky, A. F. (2015). Ecological systems theory in school psychology review. *School Psychology Review, 44*(3), 249-261. https://doi.org/10.17105/spr-15-0092.1

Burston, A., Puckering, C., & Kearney, E. (2005). At HOME in Scotland: Validation of the home observation for measurement of the environment inventory. *Child: Care, Health and Development, 31*(5), 533-538. https://doi.org/10.1111/j.1365-2214.2005.00546.x

Caldwell, B. M., & Bradley, R. H. (1984). *Home observation for measurement of the environment*. University of Arkansas at Little Rock.

Campbell, L. A., & Parcel, T. L. (2010). Children's home environments in Great Britain and the United States. *Journal of Family Issues, 31*(5), 559-584. https://doi.org/10.1177/0192513X09350441

Carneiro, A., Soares, I., Rescorla, L., & Dias, P. (2020). Meta-analysis on parent–teacher agreement on preschoolers' emotional and behavioural problems. *Child Psychiatry & Human Development, 52*(4), 609-618. https://doi.org/10.1007/s10578-020-01044-y

Caspi, A., & Moffitt, T. E. (2006). Gene–environment interactions in psychiatry: Joining forces with neuroscience. *Nature Reviews Neuroscience, 7*, 583-590.

Cassidy, J., Marvin, R. S., & the MacArthur Working Group on Attachment. (1992). Attachment organization in preschool children: Coding guidelines. In M. W. G. o. Attachment (Ed.), *Unpublished manuscript*.

Champeaux, H., Mangiavacchi, L., Marchetta, F., & Piccoli, L. (2020). *Learning at home: distance learning solutions and child development during the COVID-19 lockdown*. IZA Discussion Papers.

Chen, G., Faris, P., Hemmelgarn, B., Walker, R. L., & Quan, H. (2009). Measuring agreement of administrative data with chart data using prevalence unadjusted and adjusted kappa. *BMC Medical Research Methodology, 9*(1), 1-8.

Chess, S., & Thomas, A. (1999). *Goodness of fit: Clinical applications, from infancy through adult life*. Brunner/Mazel.

Churchill, S. L. (2003). Goodness-of-fit in early childhood settings. *Early Childhood Education Journal, 31*(2), 113-118. https://doi.org/1082-3301/03/1200-0113/0

Clark, D. A., Klump, K. L., & Burt, S. A. (2018). Parent depressive symptomatology moderates the etiology of externalizing behavior in childhood: An examination of

gene-environment interaction effects. *Developmental Psychology, 54*(7), 1277. https://doi.org/10.1037/dev0000522

Cleveland, J., Susman-Stillman, A., & Halle, T. (2013). Parental perceptions of quality in early care and education. *Child Trends*.

Coch, D., Dawson, G., & Fischer, K. W. (2007). *Human behavior, learning, and the developing brain: Atypical development*. Guilford Press.

Coley, R. L., Votruba-Drzal, E., Miller, P. L., & Koury, A. (2013). Timing, extent, and type of child care and children's behavioral functioning in kindergarten. *Developmental Psychology, 49*(10), 1859-1873. https://doi.org/10.1037/a0031251

Colonnesi, C., Draijer, E. M., Jan JM Stams, G., Van der Bruggen, C. O., Bögels, S. M., & Noom, M. J. (2011). The relation between insecure attachment and child anxiety: A meta-analytic review. *Journal of Clinical Child & Adolescent Psychology, 40*(4), 630-645. https://doi.org/10.1080/15374416.2011.581623

Colonnesi, C., van Polanen, M., Tavecchio, L. W. C., & Fukkink, R. G. (2017). Mind-mindedness of male and female caregivers in childcare and the relation to sensitivity and attachment: An exploratory study. *Infant Behavior & Development, 48*(Part B), 134-146. https://doi.org/10.1016/j.infbeh.2017.04.006

Coplan, R., Findlay, L. C., & Schneider, B. H. (2010). Where do anxious children 'fit' best? Childcare and the emergence of anxiety in early childhood. *Canadian Journal of Behavioural Science, 42*(3), 185-193. https://doi.org/10.1037/a0019280

Coplan, R. J., & Arbeau, K. A. (2008). The stresses of a "brave new world": Shyness and school adjustment in kindergarten. *Journal of Research in Childhood Education, 22*(4), 377-389. https://doi.org/10.1080/02568540809594634

Cortázar, A. (2015). Long-term effects of public early childhood education on academic achievement in Chile. *Early Childhood Research Quarterly, 32*, 13-22. https://doi.org/10.1016/j.ecresq.2015.01.003

Costantini, I., Paul, E., Caldwell, D. M., López-López, J. A., & Pearson, R. M. (2020). Protocol for a systematic review and network meta-analysis of randomised controlled trials examining the effectiveness of early parenting interventions in preventing internalising problems in children and adolescents. *Systematic Reviews, 9*(1), 1-17.

Costello, A. B., & Osborne, J. (2005). Best practices in exploratory factor analysis: Four recommendations for getting the most from your analysis. *Practical Assessment, Research, and Evaluation, 10*(1), 1-9. https://doi.org/10.7275/jyj1-4868

Côté, S. M., Boivin, M., Nagin, D. S., Japel, C., Xu, Q., Zoccolillo, M., Junger, M., & Tremblay, R. E. (2007). The role of maternal education and nonmaternal care services in the prevention of children's physical aggression problems. *Archives of General Psychiatry, 64*(11), 1305-1312. https://doi.org/10.1001/archpsyc.64.11.1305

Côté, S. M., Borge, A. I., Geoffroy, M.-C., Rutter, M., & Tremblay, R. E. (2008). Nonmaternal care in infancy and emotional/behavioral difficulties at 4 years old: Moderation by family risk characteristics. *Developmental Psychology, 44*(1), 155-168. https://doi.org/10.1037/0012-1649.44.1.155

Coy, K., Speltz, M. L., DeKlyen, M., & Jones, K. (2001). Social–cognitive processes in preschool boys with and without oppositional defiant disorder. *Journal of Abnormal Child Psychology, 29*(2), 107-119. https://doi.org/10.1023/A:1005279828676

Craig, L., & Churchill, B. (2018). Parenting stress and the use of formal and informal child care: Associations for fathers and mothers. *Journal of Family Issues, 39*(12), 3203-3224. https://doi.org/10.1177/0192513X18776419

Crawford, N. A., Schrock, M., & Woodruff-Borden, J. (2011). Child Internalizing Symptoms: Contributions of Child Temperament, Maternal Negative Affect, and Family Functioning. *Child Psychiatry and Human Development, 42*(1), 53-64. https://doi.org/10.1007/s10578-010-0202-5

Crockenberg, S., & Leerkes, E. (2003). Infant negative emotionality, caregiving, and family relationships. In A.Booth & N. Crouter (Eds.), *Children's influence on family dynamics: The neglected side of family relationships* (pp. 57-78). Erlbaum.

Crockenberg, S. C. (2003). Rescuing the baby from the bathwater: How gender and temperament (may) influence how child care affects child development. *Child Development, 74*(4), 1034-1038. https://doi.org/10.1111/1467-8624.00585

Cummings, E. M., & Cummings, J. S. (2002). Parenting and attachment. In M. H. Bornstein (Ed.), *Handbook of Parenting Volume 5 Practical Issues in Parenting* (2nd ed., pp. 35). Lawrence Erlbaum Associates.

Cummins, C., & McMaster, C. (2006). *Child mental & emotional health: A review of evidence*. Health Service Executive.

Currier, N. R., & Schmith, P. H. (1984). Social Development of Preschool Children in Home Care and Day Care Settings. *Journal of Community Health Nursing, 1*(3), 189-206. https://doi.org/10.1207/s15327655jchn0103_8

D'Onise, K., Lynch, J. W., Sawyer, M. G., & McDermott, R. A. (2010). Can preschool improve child health outcomes? A systematic review. *Social Science & Medicine, 70*(9), 1423-1440. https://doi.org/10.1016/j.socscimed.2009.12.037

Davies, S., Janus, M., Duku, E., & Gaskin, A. (2016). Using the Early Development Instrument to examine cognitive and non-cognitive school readiness and elementary student achievement. *Early Childhood Research Quarterly, 35*, 63-75. https://doi.org/10.1016/j.ecresq.2015.10.002

De Castro, B. O. (2004). The development of social information processing and aggressive behaviour: Current issues. *European Journal of Developmental Psychology, 1*(1), 87-102. https://doi.org/10.1080/17405620444000058

De Schipper, J. C., Tavecchio, L. W., Van IJzendoorn, M. H., & Van Zeijl, J. (2004). Goodness-of-fit in center day care: Relations of temperament, stability, and quality of care with the child's adjustment. *Early Childhood Research Quarterly, 19*(2), 257-272.

Delius, A., Bovenschen, I., & Spangler, G. (2008). The inner working model as a "theory of attachment": Development during the preschool years. *Attachment & Human Development, 10*, 395-414. https://doi.org/10.1080/14616730802461425

Dolan, M. M., Casanueva, C., Smith, K. R., & Bradley, R. H. (2009). Parenting and the home environment provided by grandmothers of children in the child welfare system. *Children and Youth Services Review, 31*(7), 784-796. https://doi.org/10.1016/j.childyouth.2009.02.005

Doyle, O., Finnegan, S., & McNamara, K. (2010). *Differential parent and teacher reports of school readiness in a disadvantaged community*. University College Dublin, Geary Institute.

Dozier, M., & Bernard, K. (2017). Attachment and biobehavioral catch-up: Addressing the needs of infants and toddlers exposed to inadequate or problematic caregiving. *Current Opinion in Psychology, 15*, 111-117. https://doi.org/10.1016/j.copsyc.2017.03.003

Du, F., Dong, X.-y., & Zhang, Y. (2019). Grandparent-provided childcare and labor force participation of mothers with preschool children in urban China. *China Population and Development Studies, 2*(4), 347-368. https://doi.org/10.1007/s42379-018-00020-3

Duncan, R. J., Schmitt, S. A., Burke, M., & McClelland, M. M. (2018). Combining a kindergarten readiness summer program with a self-regulation intervention improves school readiness. *Early Childhood Research Quarterly, 42*, 291-300. https://doi.org/10.1016/j.ecresq.2017.10.012

Eisenberg, N., Sadovsky, A., Spinrad, T. L., Fabes, R. A., Losoya, S. H., Valiente, C., Reiser, M., Cumberland, A., & Shepard, S. A. (2005). The relations of problem behavior status to children's negative emotionality, effortful control, and impulsivity: concurrent relations and prediction of change. *Developmental Psychology, 41*, 193-211. https://doi.org/10.1037/0012-1649.41.1.193

Eisenberg, N., Valiente, C., & Eggum, N. D. (2010). Self-regulation and school readiness. *Early Education and Development, 21*(5), 681-698. https://doi.org/10.1080/10409289.2010.497451

Eisenberg, N., Zhou, Q., Spinrad, T. L., Valiente, C., Fabes, R. A., & Liew, J. (2005). Relations among positive parenting, children's effortful control, and externalizing problems: A three‐wave longitudinal study. *Child Development, 76*(5), 1055-1071. https://doi.org/10.1111/j.1467-8624.2005.00897.x

El-Sheikh, M., & Erath, S. A. (2011). Family conflict, autonomic nervous system functioning, and child adaptation: State of the science and future directions. *Development and Psychopathology, 23*(2), 703-721. https://doi.org/10.1017/S0954579411000034

El Nokali, N. E., Bachman, H. J., & Votruba‐Drzal, E. (2010). Parent involvement and children’s academic and social development in elementary school. *Child Development, 81*(3), 988-1005. https://doi.org/10.1111/j.1467-8624.2010.01447.x

Elardo, R., Bradley, R., & Caldwell, B. M. (1975). The relation of infants' home environments to mental test performance from six to thirty-six months: A longitudinal analysis. *Child Development, 46*(1), 71-76. https://doi.org/10.2307/1128835

Elardo, R., & Bradley, R. H. (1981). The Home Observation for Measurement of the Environment (HOME) Scale: A review of research. *Developmental Review, 1*(2), 113-145. https://doi.org/10.1016/0273-2297(81)90012-5

Fanti, K. A., & Henrich, C. C. (2010). Trajectories of pure and co-occurring internalizing and externalizing problems from age 2 to age 12: Findings from the National Institute of Child Health and Human Development Study of Early Child Care. *Developmental Psychology, 46*(5), 1159-1175. https://doi.org/10.1037/a0020659

Feldman, R., Granat, A., Pariente, C., Kanety, H., Kuint, J., & Gilboa-Schechtman, E. (2009). Maternal depression and anxiety across the postpartum year and infant social engagement, fear regulation, and stress reactivity. *Journal of the American Academy of Child & Adolescent Psychiatry, 48*(9), 919-927. https://doi.org/10.1097/CHI.0b013e3181b21651

Felfe, C., & Lalive, R. (2018). Does early child care affect children's development? *Journal of Public Economics, 159*, 33-53. https://doi.org/10.1016/j.jpubeco.2018.01.014

Ferretti, L. K., & Bub, K. L. (2017). Family routines and school readiness during the transition to kindergarten. *Early Education and Development, 28*(1), 59-77. https://doi.org/10.1080/10409289.2016.1195671

Fink, A. (2015). *How to conduct surveys: A step-by-step guide*. Sage Publications.

Flannigan, C., & Dietze, B. (2017). Children, outdoor play, and loose parts. *Journal of Childhood Studies, 42*(4), 53-60. https://doi.org/10.18357/jcs.v42i4.18103

Fleiss, J. L., Levin, B., & Paik, M. C. (2013). *Statistical methods for rates and proportions* (3rd ed.). John Wiley & Sons, Inc.

Frankenburg, W. K., & Coons, C. E. (1986). Home Screening Questionnaire: Its validity in assessing home environment. *The Journal of Pediatrics, 108*(4), 624-626. https://doi.org/10.1016/S0022-3476(86)80853-8

Fraser, B., McRobbie, C., & Fisher, D. (1996). Development, validation and use of personal and class forms of a new classroom environment questionnaire. In *Proceedings Western Australian Institute for educational research forum.*

Friedman, S. L. (2007). Finding treasure: Data sharing and secondary analysis in developmental science. *Journal of Applied Developmental Psychology, 28*(5-6), 384-389. https://doi.org/10.1016/j.appdev.2007.07.001

Fuller, B., Holloway, S. D., Bozzi, L., Burr, E., Cohen, N., & Suzuki, S. (2003). Explaining local variability in child care quality: State funding and regulation in California. *Early Education and Development, 14*(1), 47-66. https://doi.org/10.1207/s15566935eed1401_4

Gagne, J. R. (2017). Self‐control in childhood: A synthesis of perspectives and focus on early development. *Child Development Perspectives, 11*(2), 127-132. https://doi.org/10.1111/cdep.12223

Galesic, M., & Bosnjak, M. (2009). Effects of questionnaire length on participation and indicators of response quality in a web survey. *Public Opinion Quarterly, 73*(2), 349-360. https://doi.org/10.1093/poq/nfp031

Gamble, W. C., Ewing, A. R., & Wilhlem, M. S. (2009). Parental perceptions of characteristics of non-parental child care: Belief dimensions, family and child correlates. *Journal of Child and Family Studies, 18*(1), 70-82. https://doi.org/10.1007/s10826-008-9208-z

García, O. F., Serra, E., Zacarés, J. J., & García, F. (2018). Parenting styles and short-and long-term socialization outcomes: A study among Spanish adolescents and older adults. *Psychosocial Intervention, 27*(3), 153-161. https://doi.org/10.5093/pi2018a21

Georgiou, S. N. (2008). Bullying and victimization at school: The role of mothers. *British Journal of Educational Psychology, 78*(1), 109-125. https://doi.org/10.1348/000709907X204363

Gialamas, A., Mittinty, M. N., Sawyer, M. G., Zubrick, S. R., & Lynch, J. (2014). Child care quality and children's cognitive and socio-emotional development: An Australian longitudinal study. *Early Child Development and Care, 184*(7), 977-997. https://doi.org/10.1080/03004430.2013.847835

Gialamas, A., Sawyer, A. C. P., Mittinty, M. N., Zubrick, S. R., Sawyer, M. G., & Lynch, J. (2014). Quality of childcare influences children's attentiveness and emotional regulation at school entry. *The Journal of Pediatrics, 165*(4), 813-819. https://doi.org/10.1016/j.jpeds.2014.06.011

Goelman, H., Zdaniuk, B., Boyce, W. T., Armstrong, J. M., & Essex, M. J. (2014). Maternal mental health, child care quality, and children's behavior. *Journal of Applied Developmental Psychology, 35*(4), 347-356. https://doi.org/10.1016/j.appdev.2014.05.003

Goemans, A., van Geel, M., Vedder, P., & Bradley, R. H. (2016). HOME in the Netherlands: Validation of the Home Observation for Measurement of the Environment Inventory. *Journal of Family Issues, 37*(15), 2118-2137. https://doi.org/10.1177/0192513X14555767

Goodman, S. H., Rouse, M. H., Connell, A. M., Broth, M. R., Hall, C. M., & Heyward, D. (2011). Maternal depression and child psychopathology: A meta-analytic review.

Clinical Child and Family Psychology Review, 14(1), 1-27. https://doi.org/10.1007/s10567-010-0080-1

Goodwin, R. D., Fergusson, D. M., & Horwood, L. J. (2004). Early anxious/withdrawn behaviours predict later internalising disorders. *Journal of Child Psychology and Psychiatry, 45*(4), 874-883. https://doi.org/10.1111/j.1469-7610.2004.00279.x

Gormley Jr, W. T., Phillips, D. A., Newmark, K., Welti, K., & Adelstein, S. (2011). Social‐emotional effects of early childhood education programs in Tulsa. *Child Development, 82*(6), 2095-2109. https://doi.org/10.1111/j.1467-8624.2011.01648.x

Gresham, F. M., Lane, K. L., MacMillan, D. L., & Bocian, K. M. (1999). Social and academic profiles of externalizing and internalizing groups: Risk factors for emotional and behavioral disorders. *Behavioral Disorders, 24*, 231-245. https://doi.org/10.1177/019874299902400303

Grills, A. E., & Ollendick, T. H. (2002). Peer victimization, global self-worth, and anxiety in middle school children. *Journal of Clinical Child and Adolescent Psychology, 31*(1), 59-68. https://doi.org/10.1207/S15374424JCCP3101_08

Guild, D. J., Toth, S. L., Handley, E. D., Rogosch, F. A., & Cicchetti, D. (2017). Attachment security mediates the longitudinal association between child-parent psychotherapy and peer relations for toddlers of depressed mothers. *Development and Psychopathology, 29*(2), 587-600. https://doi.org/10.1017/S0954579417000207

Gunnar, M. R., Kryzer, E., Van Ryzin, M. J., & Phillips, D. A. (2011). The import of the cortisol rise in child care differs as a function of behavioral inhibition. *Developmental Psychology, 47*(3), 792-803. https://doi.org/10.1037/a0021902

Halim, M. L. D., Walsh, A. S., Tamis-LeMonda, C. S., Zosuls, K. M., & Ruble, D. N. (2018). The roles of self-socialization and parent socialization in toddlers' gender-typed

appearance. *Archives of sexual behavior, 47*(8), 2277-2285. https://doi.org/10.1007/s10508-018-1263-y

Hammer, C. S., Morgan, P., Farkas, G., Hillemeier, M., Bitetti, D., & Maczuga, S. (2017). Late talkers: A population-based study of risk factors and school readiness consequences. *Journal of Speech, Language, and Hearing Research, 60*(3), 607-626. https://doi.org/10.1044/2016_JSLHR-L-15-0417

Han, W.-J., Leventhal, T., & Linver, M. R. (2004). The Home Observation for Measurement of the Environment (HOME) in middle childhood: A study of three large-scale data sets. *Parenting, 4*(2-3), 189-210. https://doi.org/10.1080/15295192.2004.9681270

Hanscom, A. J. (2016). *Balanced and barefoot: How unrestricted outdoor play makes for strong, confident, and capable children*. New Harbinger Publications.

Hanson-Cook, B. S., & Richardson, G. B. (2020). Social ecology of mental health in children with internalizing disorders. *Early Child Development and Care*, 1-15. https://doi.org/10.1080/03004430.2020.1774570

Harrison, L. J. (2008). Does child care quality matter?: Associations between socio-emotional development and non-parental child care in a representative sample of Australian children. *Family Matters, 79*, 14-25.

Hastings, P. D., McShane, K. E., Parker, R., & Ladha, F. (2007). Ready to make nice: Parental socialization of young sons' and daughters' prosocial behaviors with peers. *The Journal of Genetic Psychology, 168*(2), 177-200. https://doi.org/10.3200/GNTP.168.2.177-200

Havighurst, S. S., Wilson, K. R., Harley, A. E., Prior, M. R., & Kehoe, C. (2010). Tuning in to Kids: improving emotion socialization practices in parents of preschool children–findings from a community trial. *Journal of Child Psychology and Psychiatry, 51*(12), 1342-1350. https://doi.org/10.1111/j.1469-7610.2010.02303.x

Hayden, E. P., Klein, D. N., Durbin, C. E., & Olino, T. M. (2006). Positive emotionality at age 3 predicts cognitive styles in 7-year-old children. *Development and Psychopathology, 18*(2), 409-423. https://doi.org/10.1017/S0954579406060226

Hipson, W. E., & Séguin, D. G. (2016). Is good fit related to good behaviour? Goodness of fit between daycare teacher–child relationships, temperament, and prosocial behaviour. *Early Child Development and Care, 186*(5), 785-798. https://doi.org/10.1080/03004430.2015.1061518

Hipson, W. E., & Séguin, D. G. (2017). Goodness of Fit Model. In Z.-H. V. & S. T. (Eds.), *Encyclopedia of Personality and Individual Differences* (pp. 1-3). Springer, Cham. https://doi.org/10.1007/978-3-319-28099-8_757-1

Hollenbeck, A. R. (1978). Early infant home environments: Validation of the Home Observation for Measurement of the Environment Inventory. *Developmental Psychology, 14*(4), 416-418. https://doi.org/10.1037/0012-1649.14.4.416

Honig, A. S. (2002). *Secure relationships: Nurturing infant/toddler attachment in early care settings*. ERIC.

Horton, M. K., Kahn, L. G., Perera, F., Barr, D. B., & Rauh, V. (2012). Does the home environment and the sex of the child modify the adverse effects of prenatal exposure to chlorpyrifos on child working memory? *Neurotoxicology and Teratology, 34*(5), 534-541. https://doi.org/10.1016/j.ntt.2012.07.004

Howes, C., Phillips, D. A., & Whitebook, M. (1992). Thresholds of quality: Implications for the social development of children in center ‐ based child care. *Child Development, 63*(2), 449-460. https://doi.org/10.1111/j.1467-8624.1992.tb01639.x

Hunter, L. J., Bierman, K. L., & Hall, C. M. (2018). Assessing noncognitive aspects of school readiness: The predictive validity of brief teacher rating scales of social–emotional

competence and approaches to learning. *Early Education and Development, 29*(8), 1081-1094. https://doi.org/10.1080/10409289.2018.1495472

Huntley, F., Wright, N., Pickles, A., Sharp, H., & Hill, J. (2017). Maternal mental health and child problem behaviours: disentangling the role of depression and borderline personality dysfunction. *BJPsych Open, 3*(6), 300-305. https://doi.org/10.1192/bjpo.bp.117.005843

Huston, A. C., Bobbitt, K. C., & Bentley, A. (2015). Time spent in child care: How and why does it affect social development? *Developmental Psychology, 51*(5), 621-634.

IBM Corp. (2015). *IBM SPSS Statistics for Windows, Version 23.0*. IBM Corp.

Jackson, A. P., & Scheines, R. (2005). Single mothers' self-efficacy, parenting in the home environment, and children's development in a two-wave study. *Social Work Research, 29*(1), 7-20. https://doi.org/10.1093/swr/29.1.7

Johnson, A. D., Finch, J. E., & Phillips, D. A. (2019). Associations between publicly funded preschool and low-income children's kindergarten readiness: The moderating role of child temperament. *Developmental Psychology, 55*(3), 623–636. https://doi.org/10.1037/dev0000651

Johnson, P. L., & Flake, E. M. (2007). Maternal depression and child outcomes. *Pediatric annals, 36*(4), 196-202. https://doi.org/10.3928/0090-4481-20070401-08

Johnston, T. D., & Edwards, L. (2002). Genes, interactions, and the development of behavior. *Psychological Review, 109*(1), 26-34. https://doi.org/10.1037/0033-295X.109.1.26

Joo, Y. S., Magnuson, K., Duncan, G. J., Schindler, H. S., Yoshikawa, H., & Ziol-Guest, K. M. (2020). What works in early childhood education programs?: A meta–analysis of preschool enhancement programs. *Early Education and Development, 31*(1), 1-26. https://doi.org/10.1080/10409289.2019.1624146

Katz, L. F., & Gottman, J. M. (1993). Patterns of marital conflict predict children's internalizing and externalizing behaviors. *Developmental Psychology, 29*(6), 940-950. https://doi.org/10.1037/0012-1649.29.6.940

Kearns, K. (2016). *Birth to big school*. Cengage AU.

Keltner, D., Kogan, A., Piff, P. K., & Saturn, S. R. (2014). The sociocultural appraisals, values, and emotions (SAVE) framework of prosociality: Core processes from gene to meme. *Annual Review of Psychology, 65*, 425-460. https://doi.org/10.1146/annurev-psych-010213-115054

Kendall, P. C., Robin, J. A., Hedtke, K. A., Suveg, C., Flannery-Schroeder, E., & Gosch, E. (2005). Considering CBT with anxious youth? Think exposures. *Cognitive and Behavioral Practice, 12*(1), 136-148. https://doi.org/10.1016/S1077-7229(05)80048-3

Kensinger Rose, K., & Elicker, J. (2008). Parental decision making about child care. *Journal of Family Issues, 29*(9), 1161-1184. https://doi.org/10.1177/0192513X07312103

Kessler, R. C., Berglund, P., Demler, O., Jin, R., Merikangas, K. R., & Walters, E. E. (2005). Lifetime Prevalence and Age-of-Onset Distributions of DSM-IV Disorders in the National Comorbidity Survey Replication. *Archives of General Psychiatry, 62*(6), 593. https://doi.org/10.1001/archpsyc.62.6.593

Keys, T. D., Farkas, G., Burchinal, M. R., Duncan, G. J., Vandell, D. L., Li, W., Ruzek, E. A., & Howes, C. (2013). Preschool center quality and school readiness: Quality effects and variation by demographic and child characteristics. *Child Development, 84*(4), 1171-1190. https://doi.org/10.1111/cdev.12048

Khajehzadeh, I., & Vale, B. (2017). How New Zealanders distribute their daily time between home indoors, home outdoors and out of home. *Kōtuitui: New Zealand Journal of Social Sciences Online, 12*(1), 17-31. https://doi.org/10.1080/1177083X.2016.1187636

Khazanov, G. K., & Ruscio, A. M. (2016). Is low positive emotionality a specific risk factor for depression? A meta-analysis of longitudinal studies. *Psychological Bulletin, 142*(9), 991-1015. https://doi.org/10.1037/bul0000059

Kritzas, N., & Grobler, A. A. (2005). The relationship between perceived parenting styles and resilience during adolescence. *Journal of Child and Adolescent Mental Health, 17*(1), 1-12. https://doi.org/10.2989/17280580509486586

Kuppens, S., & Ceulemans, E. (2019). Parenting styles: A closer look at a well-known concept. *Journal of Child and Family Studies, 28*(1), 168-181. https://doi.org/10.1007/s10826-018-1242-x

LaBounty, J., Oliver, M., True, K., Cooper, H., Friesen, S., & Castro, G. (2018). The relationship between temperament style and understanding of human goal-directed action in infants. *Infant Behavior and Development, 53*, 25-32. https://doi.org/10.1016/j.infbeh.2018.09.006

Lamborn, S. D., Mounts, N. S., Steinberg, L., & Dornbusch, S. M. (1991). Patterns of competence and adjustment among adolescents from authoritative, authoritarian, indulgent, and neglectful families. *Child Development, 62*(5), 1049-1065. https://doi.org/10.1111/j.1467-8624.1991.tb01588.x

Larsen, L., Helland, M. S., & Holt, T. (2021). The impact of school closure and social isolation on children in vulnerable families during COVID-19: a focus on children's reactions. *European Child & Adolescent Psychiatry*, 1-11. https://doi.org/10.1007/s00787-021-01758-x

Lecompte, V., Robins, S., King, L., Solomonova, E., Khan, N., Moss, E., Nagy, C., Feeley, N., Gold, I., & Hayton, B. (2021). Examining the role of mother-child interactions and DNA methylation of the oxytocin receptor gene in understanding child

controlling attachment behaviors. *Attachment & Human Development, 23*(1), 37-55. https://doi.org/10.1080/14616734.2019.1708422

Lee, L.-C., Halpern, C. T., Hertz-Picciotto, I., Martin, S. L., & Suchindran, C. M. (2006). Child care and social support modify the association between maternal depressive symptoms and early childhood behaviour problems: A US national study. *Journal of Epidemiology and Community Health, 60*(4), 305-310. https://doi.org/10.1136/jech.2005.040956

Lehrl, S., Kluczniok, K., & Rossbach, H.-G. (2016). Longer-term associations of preschool education: The predictive role of preschool quality for the development of mathematical skills through elementary school. *Early Childhood Research Quarterly, 36*, 475-488. https://doi.org/10.1016/j.ecresq.2016.01.013

Leve, L. D., Kim, H. K., & Pears, K. C. (2005). Childhood temperament and family environment as predictors of internalizing and externalizing trajectories from ages 5 to 17. *Journal of Abnormal Child Psychology, 33*(5), 505-520. https://doi.org/10.1007/s10802-005-6734-7

Liang, X., Fuller, B., & Singer, J. D. (2000). Ethnic differences in child care selection: the influence of family structure, parental practices, and home language. *Early Childhood Research Quarterly, 15*(3), 357-384. https://doi.org/10.1016/S0885-2006(00)00071-5

Lillvist, A., Sandberg, A., Björck-Äkesson, E., & Granlund, M. (2009). The construct of social competence-how preschool teachers define social competence in young children. *International Journal of Early Childhood, 41*(1), 51-68. https://doi.org/10.1007/BF03168485

Linberg, A., Burghardt, L., Freund, J.-D., & Weinert, S. (2020). Differential effect of duration of early childcare under the age of three on socio-emotional outcomes. *Early*

Child Development and Care, 190(16), 2505-2519. https://doi.org/10.1080/03004430.2019.1588891

Loebach, J., & Gilliland, J. (2016). Neighbourhood play on the endangered list: examining patterns in children's local activity and mobility using GPS monitoring and qualitative GIS. *Children's Geographies, 14*(5), 573-589. https://doi.org/10.1080/14733285.2016.1140126

Lugo‐Gil, J., & Tamis‐LeMonda, C. S. (2008). Family resources and parenting quality: Links to children's cognitive development across the first 3 years. *Child Development, 79*(4), 1065-1085. https://doi.org/10.1111/j.1467-8624.2008.01176.x

Malekpour, M. (2007). Effects of attachment on early and later development. *The British Journal of Development Disabilities, 53*(105), 81-95. https://doi.org/10.1179/096979507799103360

Mann, T. D., Hund, A. M., Hesson‐McInnis, M. S., & Roman, Z. J. (2017). Pathways to school readiness: Executive functioning predicts academic and social–emotional aspects of school readiness. *Mind, Brain, and Education, 11*(1), 21-31. https://doi.org/10.1111/mbe.12134

Markström, A.-M., & Simonsson, M. (2017). Introduction to preschool: strategies for managing the gap between home and preschool. *Nordic Journal of Studies in Educational Policy, 3*(2), 179-188. https://doi.org/10.1080/20020317.2017.1337464

Masten, A. S., & Barnes, A. J. (2018). Resilience in children: Developmental perspectives. *Children, 5*(7), 98. https://doi.org/10.3390/children5070098

McCartney, K., Burchinal, M., Clarke-Stewart, A., Bub, K. L., Owen, M. T., & Belsky, J. (2010). Testing a series of causal propositions relating time in child care to children's externalizing behavior. *Developmental Psychology, 46*(1), 1-17. https://doi.org/10.1037/a0017886

McCormick, B. J., Caulfield, L. E., Richard, S. A., Pendergast, L., Seidman, J. C., Maphula, A., Koshy, B., Blacy, L., Roshan, R., & Nahar, B. (2020). Early life experiences and trajectories of cognitive development. *Pediatrics, 146*(3), 1-11. https://doi.org/10.1542/peds.2019-3660

McCoy, D. C., Zuilkowski, S. S., Yoshikawa, H., & Fink, G. (2017). Early childhood care and education and school readiness in Zambia. *Journal of Research on Educational Effectiveness, 10*(3), 482-506. https://doi.org/10.1080/19345747.2016.1250850

McCutcheon, B., & Calhoun, K. S. (1976). Social and emotional adjustment of infants and toddlers to a day care setting. *American Journal of Orthopsychiatry, 46*(1), 104-108. https://doi.org/10.1111/j.1939-0025.1976.tb01231.x

Merrell, K. W. (1996). Social-emotional assessment in early childhood: The Preschool and Kindergarten Behavior Scales. *Journal of Early Intervention, 20*(2), 132-145. https://doi.org/10.1177/105381519602000205

Merrell, K. W. (2002). *Preschool and Kindergarten Behavior Scales: Examiners Manuel* (2nd ed.). PRO-ED.

Miller, S. R., & Coll, E. (2007). From social withdrawal to social confidence: Evidence for possible pathways. *Current Psychology, 26*(2), 86-101. https://doi.org/10.1007/s12144-007-9006-6

Morawska, A., Winter, L., & Sanders, M. (2009). Parenting knowledge and its role in the prediction of dysfunctional parenting and disruptive child behaviour. *Child: Care, Health and Development, 35*(2), 217-226. https://doi.org/10.1111/j.1365-2214.2008.00929.x

Mott, F. L. (2004). The utility of the HOME-SF scale for child development research in a large national longitudinal survey: the National Longitudinal Survey of Youth 1979 cohort. *Parenting, 4*(2-3), 259-270. https://doi.org/10.1080/15295192.2004.9681273

Mullan, K. (2019). A child's day: Trends in time use in the UK from 1975 to 2015. *The British journal of sociology, 70*(3), 997-1024. https://doi.org/10.1111/1468-4446.12369

Muris, P., Meesters, C., & Fijen, P. (2003). The self-perception profile for children: Further evidence for its factor structure, reliability, and validity. *Personality and Individual Differences, 35*(8), 1791-1802. https://doi.org/10.1016/S0191-8869(03)00004-7

Narea, M., Toppelberg, C. O., Irarrázaval, M., & Xu, J. (2020). Maternal and non-maternal care in infancy and later child cognitive, language and motor development in Chile: Does type of care matter? *Early Childhood Research Quarterly, 51*, 204-214. https://doi.org/10.1016/j.ecresq.2019.10.010

National Institutes of Health. (2003). *Final NIH statement on sharing research data. NOT-OD-03e032.* http://grants.nih.gov/grants/policy/data_sharing/data_sharing_guidance.htm

NICHD ECCRN. (2001a). Child care and children's peer interaction at 24 and 36 months: The NICHD study of early child care. *Child Development, 72*(5), 1478-1500. https://doi.org/10.1111/1467-8624.00361

NICHD ECCRN. (2001b). Nonmaternal care and family factors in early development: An overview of the NICHD Study of Early Child Care. *Journal of Applied Developmental Psychology, 22*(5), 457-492. https://doi.org/10.1016/S0193-3973(01)00092-2

NICHD ECCRN. (2002). Early child care and children's development prior to school entry: Results from the NICHD Study of Early Child Care. *American Educational Research Journal, 39*(1), 133-164. https://doi.org/10.3102/00028312039001133

NICHD ECCRN. (2003a). Does Amount of Time Spent in Child Care Predict Socioemotional Adjustment During the Transition to Kindergarten? *Child Development, 74*(4), 976-1005. https://doi.org/10.1111/1467-8624.00582

NICHD ECCRN. (2003b). Social functioning in first grade: Associations with earlier home and child care predictors and with current classroom experiences. *Child Development, 74*(6), 1639-1662. https://doi.org/10.1046/j.1467-8624.2003.00629.x

NICHD ECCRN. (2005a). *Child care and child development: Results from the NICHD study of early child care and youth development*. Guilford Press.

NICHD ECCRN. (2005b). Early child care and children's development in the primary grades: Follow-up results from the NICHD study of early child care. *American Educational Research Journal, 42*(3), 537-570. https://doi.org/10.3102/00028312042003537

Niklas, F., Tayler, C., & Gilley, T. (2017). Vulnerable children in Australia: multiple risk factor analyses to predict cognitive abilities and problem behaviour. *Australian Journal of Education, 61*(2), 105-123. https://doi.org/10.1177/0004944117710954

Nomaguchi, K. M. (2006). Maternal employment, nonparental care, mother-child interactions, and child outcomes during preschool years. *Journal of Marriage and Family, 68*(5), 1341-1369. https://doi.org/10.1111/j.1741-3737.2006.00332.x

Noordermeer, S. D., Luman, M., Weeda, W. D., Buitelaar, J. K., Richards, J. S., Hartman, C. A., Hoekstra, P. J., Franke, B., Heslenfeld, D. J., & Oosterlaan, J. (2017). Risk factors for comorbid oppositional defiant disorder in attention-deficit/hyperactivity disorder. *European Child & Adolescent Psychiatry, 26*(10), 1155-1164. https://doi.org/10.1007/s00787-017-0972-4

NSW Government. (2021). *Early childhood education*. https://education.nsw.gov.au/early-childhood-education

O'Connor, E. E., Collins, B. A., & Supplee, L. (2012). Behavior problems in late childhood: The roles of early maternal attachment and teacher–child relationship trajectories. *Attachment & Human Development, 14*(3), 265-288. https://doi.org/10.1080/14616734.2012.672280

OECD. (2013). *Education Policy Outlook: Australia*. OECD Publishing,.

Oldehinkel, A. J., Hartman, C. A., De Winter, A. F., Veenstra, R., & Ormel, J. (2004). Temperament profiles associated with internalizing and externalizing problems in preadolescence. *Development and Psychopathology, 16*(2), 421-440. https://doi.org/10.1017/S0954579404044591

Oliver, B. R., & Plomin, R. (2007). Twins' Early Development Study (TEDS): A multivariate, longitudinal genetic investigation of language, cognition and behavior problems from childhood through adolescence. *Twin Research and Human Genetics, 10*(1), 96-105. https://doi.org/10.1375/twin.10.1.96

Paat, Y.-F. (2013). Working with immigrant children and their families: An application of Bronfenbrenner's ecological systems theory. *Journal of Human Behavior in the Social Environment, 23*(8), 954-966. https://doi.org/10.1080/10911359.2013.800007

Pallant, J. (2007). *SPSS survival manual: A step by step guide to data anlysis using SPSS for windows* (3 ed.). Open University Press.

Pellicano, E., Kenny, L., Brede, J., Klaric, E., Lichwa, H., & McMillin, R. (2017). Executive function predicts school readiness in autistic and typical preschool children. *Cognitive Development, 43*, 1-13. https://doi.org/10.1016/j.cogdev.2017.02.003

Persson, S., & Tallberg Broman, I. (2017). Early childhood education and care as a historically located place–the significance for parental cooperation and the professional assignment. *Nordic Journal of Studies in Educational Policy, 3*(2), 189-199. https://doi.org/10.1080/20020317.2017.1352440

Pesowski, M. L., & Friedman, O. (2018). Using versus liking: Young children use ownership to predict actions but not to infer preferences. *Journal of Experimental Child Psychology, 169*, 19-29. https://doi.org/10.1016/j.jecp.2017.12.007

Phillips, D., McCartney, K., & Scarr, S. (1987). Child-care quality and children's social development. *Developmental Psychology, 23*(4), 537-543. https://doi.org/10.1037/0012-1649.23.4.537

Phillips, D. A., & Shonkoff, J. P. (2000). *From neurons to neighborhoods: The science of early childhood development*. National Academy Press.

Pinquart, M. (2017). Associations of parenting dimensions and styles with externalizing problems of children and adolescents: An updated meta-analysis. *Developmental Psychology, 53*(5), 873. http://dx.doi.org/10.1037/dev0000295

Pituch, K., & Stevens, J. (2016). *Applied Multivariate Statistics for the Social Sciences: Analyses with SAS and IBM's SPSS* (6th ed.). Routledge.

Pluess, M., & Belsky, J. (2009). Differential susceptibility to rearing experience: The case of childcare. *Journal of Child Psychology and Psychiatry, 50*(4), 396-404. https://doi.org/10.1111/j.1469-7610.2008.01992.x

Pluess, M., & Belsky, J. (2010). Differential susceptibility to parenting and quality child care. *Developmental Psychology, 46*(2), 379-390. https://doi.org/10.1037/a0015203

Ponterotto, J. G., & Ruckdeschel, D. E. (2007). An overview of coefficient alpha and a reliability matrix for estimating adequacy of internal consistency coefficients with psychological research measures. *Perceptual and Motor Skills, 105*(3), 997-1014. https://doi.org/10.2466/pms.105.3.997-1014

Prime, H., Wade, M., & Browne, D. T. (2020). Risk and resilience in family well-being during the COVID-19 pandemic. *American Psychologist, 75*(5), 631-643. https://doi.org/10.1037/amp0000660

Puccioni, J. (2015). Parents' conceptions of school readiness, transition practices, and children's academic achievement trajectories. *The Journal of Educational Research, 108*(2), 130-147. https://doi.org/10.1080/00220671.2013.850399

Puccioni, J. (2018). Parental beliefs about school readiness, home and school-based involvement, and children's academic achievement. *Journal of Research in Childhood Education, 32*(4), 435-454. https://doi.org/10.1080/02568543.2018.1494065

Puma, M., Bell, S., Cook, R., Heid, C., & Lopez, M. (2005). Head Start Impact Study: First Year Findings. *Administration for Children & Families*.

Qu, L., & Weston, R. (2013). *Australian households and families: Australian family trends* (Vol. 4). Australian Institute of Family Studies.

Qualtrics. (2020). *Qualtrics Software, Version XM, Copyright ©2020*. Qualtrics and all other Qualtrics product or service names are registered trademarks or trademarks of Qualtrics, Provo, UT, USA. https://www.qualtrics.com

Rapee, R. M., Lyneham, H. J., Hudson, J. L., Kangas, M., Wuthrich, V. M., & Schniering, C. A. (2013). Effect of comorbidity on treatment of anxious children and adolescents: Results from a large, combined sample. *Journal of the American Academy of Child & Adolescent Psychiatry, 52*(1), 47-56. https://doi.org/10.1016/j.jaac.2012.10.002

Riise, E. N., Wergeland, G. J. H., Njardvik, U., & Öst, L.-G. (2020). Cognitive behavior therapy for externalizing disorders in children and adolescents in routine clinical care: A systematic review and meta-analysis. *Clinical Psychology Review, 83*, 101954. https://doi.org/10.1016/j.cpr.2020.101954

Rimm-Kaufman, S., & Sandilos, L. (2004). School transition and school readiness: An outcome of early childhood development. In Tremblay RE, Barr RG, & Peters RD

(Eds.), *Encyclopedia on early childhood development* (pp. 1-7). Centre of Excellence for Early Childhood Development.

Ritblatt, S. N., Hokoda, A., & Van Liew, C. (2017). Investing in the early childhood mental health workforce development: Enhancing professionals' competencies to support emotion and behavior regulation in young children. *Brain sciences, 7*(9), 120. https://doi.org/10.3390/brainsci7090120

Rossi, P. H., Wright, J. D., & Anderson, A. B. (2013). *Handbook of survey research*. Academic press.

Rothbart, M. K. (1981). Measurement of temperament in infancy. *Child Development, 52*(2), 569-578. https://doi.org/10.2307/1129176

Rothbart, M. K., & Bates, J. E. (1998). Temperament. In W. Damon & N. Eisenberg (Eds.), *Handbook of child psychology: vol. 3. Social, emotional, and personality development* (5th ed., pp. 105–176). Wiley.

Rothbart, M. K., & Bates, J. E. (2006). Temperament. In W. Damon & R. Lerner (Eds.), *Social, emotional, and personality development, Handbook of Child Psychology* (6th ed., pp. 99–166). Wiley.

Rothbaum, F., & Weisz, J. R. (1994). Parental caregiving and child externalizing behavior in nonclinical samples: A meta-analysis. *Psychological Bulletin, 116*(1), 55-74.

Rubin, D. B. (1976). Inference and missing data. *Biometrika, 63*(3), 581-592. https://doi.org/10.1093/biomet/63.3.581

Rudasill, K. M., Hawley, L., Molfese, V. J., Tu, X., Prokasky, A., & Sirota, K. (2016). Temperament and teacher–child conflict in preschool: The moderating roles of classroom instructional and emotional support. *Early Education and Development, 27*(7), 859-874. https://doi.org/10.1080/10409289.2016.1156988

Scarr, S., & McCartney, K. (1983). How people make their own environments: A theory of genotype→ environment effects. *Child Development, 54*(2), 424-435. https://doi.org/10.2307/1129703

Schmitt, N. (1996). Uses and abuses of coefficient alpha. *Psychological Assessment, 8*(4), 350-353. https://doi.org/10.1037/1040-3590.8.4.350

Sezgin, E., & Demiriz, S. (2019). Effect of play-based educational programme on behavioral self-regulation skills of 48-60 month-old children. *Early Child Development and Care, 189*(7), 1100-1113. https://doi.org/10.1080/03004430.2017.1369972

Sheridan, B. A., Macdonald, D. A., McGovern, K., Donlon, M., Kuhn, B., & Friedman, H. (2011). Evaluation of a social skills program based on social learning theory, implemented in a school setting. *Psychological Reports, 108*(2), 420-436. https://doi.org/10.2466/10.11.17.PR0.108.2.420-436

Shonkoff, J. P. (2017). Breakthrough impacts: What science tells us about supporting early childhood development. *YC Young Children, 72*(2), 8-16.

Silver, R. B., Measelle, J. R., Armstrong, J. M., & Essex, M. J. (2005). Trajectories of classroom externalizing behavior: Contributions of child characteristics, family characteristics, and the teacher–child relationship during the school transition. *Journal of School Psychology, 43*(1), 39-60. https://doi.org/10.1016/j.jsp.2004.11.003

Sim, J., & Wright, C. C. (2005). The kappa statistic in reliability studies: Use, interpretation, and sample size requirements. *Physical therapy, 85*(3), 257-268. https://doi.org/10.1093/ptj/85.3.257

Sines, J., Clarke, W., & Lauer, R. (1984). Home environment questionnaire. *Journal of Abnormal Child Psychology, 12*(4), 519-529. https://doi.org/10.1007/BF00916847

Skinner, B. F. (1937). Two types of conditioned reflex: A reply to Konorski and Miller. *The Journal of General Psychology, 16*(1), 272-279. https://doi.org/10.1080/00221309.1937.9917951

Skinner, E. A., & Zimmer-Gembeck, M. J. (2016). Development of coping during toddlerhood: Explicit appraisals, emotional action regulation, and cooperative coping systems. In *The Development of Coping* (pp. 129-142). Springer, Cham. https://doi.org/10.1007/978-3-319-41740-0_7

Smidt, S. (2010). *Playing to learn: The role of play in the early years* (1st ed.). Routledge. https://doi.org/10.4324/9780203851999

Spivak, A. L., & Farran, D. C. (2016). Predicting first graders' social competence from their preschool classroom interpersonal context. *Early Education and Development, 27*(6), 735-750. https://doi.org/10.1080/10409289.2016.1138825

Sprott, J., Jenkins, J., & Doob, A. (2000). National Longitudinal Survey of Children and Youth. Quebec, Canada: Report prepared for the Applied Research Branch, Strategic Policy, Human Resources Development Canada.

Sroufe, L. A. (1988). The role of infant-caregiver attachment in development. In Jay Belsky & T. Nezworski (Eds.), *Clinical implications of attachment* (pp. 18-38). Lawrence Erlbaum Associates.

Staples, A. D., & Bates, J. E. (2018). Parenting of infants and toddlers. In *Handbook of parenting and child development across the lifespan* (pp. 585-607). Springer, Cham.

Stein, A., Malmberg, L. E., Leach, P., Barnes, J., & Sylva, K. (2013). The influence of different forms of early childcare on children's emotional and behavioural development at school entry. *Child: Care, Health and Development, 39*(5), 676-687. https://doi.org/10.1111/j.1365-2214.2012.01421.x

Steinberg, L., Lamborn, S. D., Darling, N., Mounts, N. S., & Dornbusch, S. M. (1994). Over‐time changes in adjustment and competence among adolescents from authoritative, authoritarian, indulgent, and neglectful families. *Child Development, 65*(3), 754-770. https://doi.org/10.1111/j.1467-8624.1994.tb00781.x

Storch, E. A., & Masia-Warner, C. (2004). The relationship of peer victimization to social anxiety and loneliness in adolescent females. *Journal of Adolescence, 27*(3), 351-362. https://doi.org/10.1016/j.adolescence.2004.03.003

Stormont, M. A., Thompson, A. M., Herman, K. C., & Reinke, W. M. (2017). The social and emotional dimensions of a single item overall school readiness screener and its relation to academic outcomes. *Assessment for Effective Intervention, 42*(2), 67-76. https://doi.org/10.1177/1534508416652070

Sugland, B. W., Zaslow, M., Smith, J. R., Brooks-Gunn, J., Coates, D., Blumenthal, C., Moore, K. A., Griffin, T., & Bradley, R. (1995). The early childhood HOME Inventory and HOME-short form in differing racial/ethnic groups: Are there differences in underlying structure, internal consistency of subscales, and patterns of prediction? *Journal of Family Issues, 16*(5), 632-663. https://doi.org/10.1177/019251395016005007

Suveg, C., Southam‐Gerow, M. A., Goodman, K. L., & Kendall, P. C. (2007). The role of emotion theory and research in child therapy development. *Clinical Psychology: Science and Practice, 14*, 358-371. https://doi.org/10.1111/j.1468-2850.2007.00096.x

Tabachnick, B. G., Fidell, L. S., & Ullman, J. B. (2007). *Using multivariate statistics* (Vol. 5). Pearson.

Taber, K. S. (2018). The use of Cronbach's alpha when developing and reporting research instruments in science education. *Research in Science Education, 48*(6), 1273-1296. https://doi.org/10.1007/s11165-016-9602-2

Tandon, M., Cardeli, E., & Luby, J. (2009). Internalizing disorders in early childhood: A review of depressive and anxiety disorders. *Child and Adolescent Psychiatric Clinics, 18*(3), 593-610. https://doi.org/10.1016/j.chc.2009.03.004

Tavakol, M., & Dennick, R. (2011). Making sense of Cronbach's alpha. *International journal of medical education, 2*, 53-55. https://doi.org/10.5116/ijme.4dfb.8dfd

Tavassolie, T., Dudding, S., Madigan, A., Thorvardarson, E., & Winsler, A. (2016). Differences in perceived parenting style between mothers and fathers: Implications for child outcomes and marital conflict. *Journal of Child and Family Studies, 25*(6), 2055-2068. https://doi.org/10.1007/s10826-016-0376-y

Tayler, C., Cloney, D., Adams, R., Ishimine, K., Thorpe, K., & Nguyen, T. K. C. (2016). Assessing the effectiveness of Australian early childhood education and care experiences: Study protocol. *Bmc Public Health, 16*(1), 352-364. https://doi.org/10.1186/s12889-016-2985-1

Tayler, C., Thorpe, K., Nguyen, C., Adams, R., & Ishimine, K. (2016). *The E4Kids study: Assessing the effectiveness of Australian early childhood education and care programs. Overview of findings at 2016*. http://education.unimelb.edu.au/__data/assets/pdf_file/0004/2310907/E4Kids - Report - 3.0_WEB.pdf

Thompson, R. A., Winer, A. C., & Goodvin, R. (2013). The individual child: Temperament, emotion, self, and personality. In *Social and Personality Development* (pp. 225-266). Psychology Press.

Thomson, K. C., Richardson, C. G., Gadermann, A. M., Emerson, S. D., Shoveller, J., & Guhn, M. (2019). Association of childhood social-emotional functioning profiles at school entry with early-onset mental health conditions. *JAMA network open, 2*(1), e186694-e186694. https://doi.org/10.1001/jamanetworkopen.2018.6694

Thorley, C. (2016). *Education, education, mental health: Supporting secondary schools to play a central role in early intervention mental health services*. IPPR.

Thornberry, T. P., & Krohn, M. D. (2017). Applying interactional theory to the explanation of continuity and change in antisocial behavior. In *Integrated developmental and life-course theories of offending* (pp. 183-210). Routledge.

Topham, G. L., Page, M. C., Hubbs-Tait, L., Rutledge, J. M., Kennedy, T. S., Shriver, L., & Harrist, A. W. (2010). Maternal depression and socio-economic status moderate the parenting style/child obesity association. *Public Health Nutrition, 13*(8), 1237-1244. https://doi.org/10.1017/S1368980009992163

Totsika, V., & Sylva, K. (2004). The home observation for measurement of the environment revisited. *Child and Adolescent Mental Health, 9*(1), 25-35. https://doi.org/10.1046/j.1475-357X.2003.00073.x

Tronick, E., & Reck, C. (2009). Infants of depressed mothers. *Harvard review of psychiatry, 17*, 147-156.

Tully, L. A., & Hunt, C. (2016). Brief parenting interventions for children at risk of externalizing behavior problems: A systematic review. *Journal of Child and Family Studies, 25*(3), 705-719.

United States Department of Education. (1993). *Readiness for Kindergarten: Parent and Teacher Beliefs. Statistics in Brief*. National Center for Education Statistics, Office of Educational Research and Improvement. https://nces.ed.gov/pubs93/web/93257.asp

Van Beijsterveldt, T. C. E. M., Hudziak, J. J., & Boomsma, D. I. (2005). Short- and long-term effects of child care on problem behaviors in a Dutch sample of twins. *Twin Research and Human Genetics, 8*(3), 250-258. https://doi.org/10.1375/twin.8.3.250

van Huizen, T., & Plantenga, J. (2018). Do children benefit from universal early childhood education and care? A meta-analysis of evidence from natural experiments.

Economics of Education Review, 66, 206-222. https://doi.org/10.1016/j.econedurev.2018.08.001

Vandell, D. L. (2004). Early child care: The known and the unknown. *Merrill-Palmer Quarterly 50*(3), 387-414.

Vandell, D. L., Burchinal, M., & Pierce, K. M. (2016). Early child care and adolescent functioning at the end of high school: Results from the NICHD Study of Early Child Care and Youth Development. *Developmental Psychology, 52*(10), 1634–1645. https://doi.org/10.1037/dev0000169

Vitiello, V. E., Moas, O., Henderson, H. A., Greenfield, D. B., & Munis, P. M. (2012). Goodness of fit between children and classrooms: Effects of child temperament and preschool classroom quality on achievement trajectories. *Early Education & Development, 23*(3), 302-322. https://doi.org/10.1080/10409289.2011.526415

Vlasov, J., & Hujala, E. (2017). Parent-teacher cooperation in early childhood education–directors' views to changes in the USA, Russia, and Finland. *European Early Childhood Education Research Journal, 25*(5), 732-746.

Votruba-Drzal, E., Coley, R. L., Collins, M., & Miller, P. (2015). Center-based preschool and school readiness skills of children from immigrant families. *Early Education and Development, 26*(4), 549-573. https://doi.org/10.1080/10409289.2015.1000220

Waldfogel, J. (2006). *What Children Need*. Harvard University Press.

Wang, C., Williams, K. E., Shahaeian, A., & Harrison, L. J. (2018). Early predictors of escalating internalizing problems across middle childhood. *School Psychology Quarterly, 33*(2), 200-212. https://doi.org/10.1037/spq0000218

Weston, S. J., Ritchie, S. J., Rohrer, J. M., & Przybylski, A. K. (2019). Recommendations for increasing the transparency of analysis of preexisting data sets. *Advances in Methods*

and Practices in Psychological Science, 2(3), 214-227. https://doi.org/10.1177/2515245919848684

Williford, A. P., & Shelton, T. L. (2008). Using mental health consultation to decrease disruptive behaviors in preschoolers: Adapting an empirically‐supported intervention. *Journal of Child Psychology and Psychiatry, 49*(2), 191-200. https://doi.org/10.1111/j.1469-7610.2007.01839.x

Willner, C. J., Gatzke-Kopp, L. M., & Bray, B. C. (2016). The dynamics of internalizing and externalizing comorbidity across the early school years. *Development and Psychopathology, 28*(4pt1), 1033-1052. https://doi.org/10.1017/S0954579416000687

Yan, N., Zhou, N., & Ansari, A. (2016). Maternal depression and children's cognitive and socio-emotional development at first grade: The moderating role of classroom emotional climate. *Journal of Child and Family Studies, 25*, 1247-1256. https://doi.org/10.1007%2Fs10826-015-0301-9

Yap, M. B. H., & Jorm, A. F. (2015). Parental factors associated with childhood anxiety, depression, and internalizing problems: A systematic review and meta-analysis. *Journal of Affective Disorders, 175*, 424-440. https://doi.org/10.1016/j.jad.2015.01.050

Yeates, K. O., MacPhee, D., Campbell, F. A., & Ramey, C. T. (1983). Maternal IQ and home environment as determinants of early childhood intellectual competence: A developmental analysis. *Developmental Psychology, 19*(5), 731-739. https://doi.org/10.1037/0012-1649.19.5.731

Yngvesson, T., & Garvis, S. (2019). Preschool and home partnerships in Sweden, what do the children say? *Early Child Development and Care, 191*(11), 1-15. https://doi.org/10.1080/03004430.2019.1673385

Zachrisson, H. D., Dearing, E., Lekhal, R., & Toppelberg, C. O. (2013). Little evidence that time in child care causes externalizing problems during early childhood in Norway. *Child Development, 84*(4), 1152-1170. https://doi.org/10.1111/cdev.12040

Zajac, L., Prendergast, S., Feder, K. A., Cho, B., Kuhns, C., & Dozier, M. (2020). Trajectories of sleep in Child Protective Services (CPS)-referred children predict externalizing and internalizing symptoms in early childhood. *Child Abuse & Neglect, 103*, 104433. https://doi.org/10.1016/j.chiabu.2020.104433

Zeman, J., Shipman, K., & Suveg, C. (2002). Anger and sadness regulation: Predictions to internalizing and externalizing symptoms in children. *Journal of Clinical Child and Adolescent Psychology, 31*(3), 393-398. https://doi.org/10.1207/S15374424JCCP3103_11

Zilanawala, A., Sacker, A., & Kelly, Y. (2019). Internalising and externalising behaviour profiles across childhood: The consequences of changes in the family environment. *Social Science & Medicine, 226*, 207-216. https://doi.org/10.1016/j.socscimed.2019.02.048

Zubrick, S. R., Lucas, N., Westrupp, E. M., & Nicholson, J. M. (2014). *Parenting measures in the Longitudinal Study of Australian Children: Construct validity and measurement quality, Waves 1 to 4*. Department of Social Services.

Appendix A

Ethics Approval Letters

-NSW State Education Research Applications Process (SERAP)

-University of Technology, Sydney Human Research Ethics Committee (UTS HREC)

NSW GOVERNMENT Education Public Schools

SERAP 2018769

Dear Miss Papaloizou

I refer to your application to conduct a research project in NSW government schools entitled *Children's Trajectories as a Function of Early Child Care*. I am pleased to inform you that your application has been approved.

You may contact principals of the nominated schools to seek their participation. **You should include a copy of this letter with the documents you send to principals.**

This approval will remain valid until 16-Apr-2021.

The following researchers or research assistants have fulfilled the Working with Children screening requirements to interact with or observe children for the purposes of this research for the period indicated:

Researcher name	WWCC	WWCC expires
Andrea Papaloizou	WWC0544023E	04-May-2021
John McAloon	WWC0154636E	08-Nov-2023

I draw your attention to the following requirements for all researchers in NSW government schools:

- The privacy of participants is to be protected as per the NSW Privacy and Personal Information Protection Act 1998.
- School principals have the right to withdraw the school from the study at any time. The approval of the principal for the specific method of gathering information must also be sought.
- The privacy of the school and the students is to be protected.
- The participation of teachers and students must be voluntary and must be at the school's convenience.
- Any proposal to publish the outcomes of the study should be discussed with the research approvals officer before publication proceeds.
- All conditions attached to the approval must be complied with.

When your study is completed please email your report to: serap@det.nsw.edu.au.
You may also be asked to present on the findings of your research.

I wish you every success with your research.

Yours sincerely

Production Note:
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prior to publication.

Dr Robert Stevens
Manager, Research
Strategic Analysis | CESE

STRATEGIC ANALYSIS UNIT | CESE
NSW Department of Education
Level 9, 105 Phillip Street, Parramatta NSW 2150 | GPO Box 33, Sydney NSW 2001
Telephone: 7814 2547 – Email: det.serap@det.nsw.edu.au

DOC20/1030357

SERAP 2018769

Dear Miss Papaloizou

I refer to your application for variation to the research project being conducted in NSW government schools entitled *Children's Trajectories as a Function of Early Child Care*. I am pleased to inform you that your application for variation has been approved.

This variation approval will remain valid until 16-Apr-2020.

The following researchers or research assistants have fulfilled the Working with Children screening requirements to interact with or observe children for the purposes of this research for the period indicated:

Researcher name	**WWCC**	**WWCC expires**
Andrea Papaloizou	WWC0544023E	04-May-2021
Giuseppina ("Josephine") Paparo	WWC0324351E	22-Mar-2019
John McAloon	WWC0154636E	08-Nov-2023

When your study is completed please upload your report to SERAP online http://serap.det.nsw.edu.au

Yours sincerely

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prior to publication.

Dr Robert Stevens
Manager, Research
Strategic Analysis and Research
Centre for Education Statistics and Evaluation
Wednesday, 7 October 2020

STRATEGIC ANALYSIS AND RESEARCH CENTRE FOR EDUCATION STATISTICS AND EVALUATION NSW Department of Education Level 9, 105 Phillip Street, Parramatta NSW 2150 | GPO Box 33, Sydney NSW 2001 Telephone: 7814 2547 – Email: det.serap@det.nsw.edu.au

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UTS CRICOS PROVIDER CODE 00099F

20 December 2018

Dr John McAloon
Faculty of Health
UNIVERSITY OF TECHNOLOGY SYDNEY

Dear John,

UTS HREC ETH18-2307 – MCALOON (for PAPALOIZOU) – "Children's Trajectories as a Function of Early Child Care"

Thank you for your response to the Committee's comments for your project titled, "Children's Trajectories as a Function of Early Child Care". The Committee agreed that this application now meets the requirements of the National Statement on Ethical Conduct in Human Research (2007) and has been approved on that basis. You are therefore authorised to commence activities as outlined in your application.

You are reminded that this letter constitutes ethics approval only. This research project must also be undertaken in accordance with all UTS policies and guidelines including the Research Management Policy (http://www.gsu.uts.edu.au/policies/research-management-policy.html).

Your approval number is UTS HREC REF NO. ETH18-2307.

Approval will be for a period of five (5) years from the date of this correspondence subject to the submission of annual progress reports.

The following standard conditions apply to your approval:

- Your approval number must be included in all participant material and advertisements. Any advertisements on Staff Connect without an approval number will be removed.

- The Principal Investigator will immediately report anything that might warrant review of ethical approval of the project to the Ethics Secretariat (Research.Ethics@uts.edu.au).

- The Principal Investigator will notify the UTS HREC of any event that requires a modification to the protocol or other project documents, and submit any required amendments prior to implementation. Instructions can be found at https://staff.uts.edu.au/topichub/Pages/Researching/Research%20Ethics%20and%20Integrity/Human%20research%20ethics/Post-approval/post-approval.aspx#tab2.

- The Principal Investigator will promptly report adverse events to the Ethics Secretariat (Research.Ethics@uts.edu.au). An adverse event is any event (anticipated or otherwise) that has a negative impact on participants, researchers or the reputation of the University. Adverse events can also include privacy breaches, loss of data and damage to property.

- The Principal Investigator will report to the UTS HREC annually and notify the HREC when the project is completed at all sites. The Principal Investigator will notify the UTS HREC of any plan to extend the duration of the project past the approval period listed above through the progress report.

- The Principal Investigator will obtain any additional approvals or authorisations as required (e.g. from other ethics committees, collaborating institutions, supporting organisations).

- The Principal Investigator will notify the UTS HREC of his or her inability to continue as Principal Investigator including the name of and contact information for a replacement.

I also refer you to the AVCC guidelines relating to the storage of data, which require that data be kept for a minimum of 5 years after publication of research. However, in NSW, longer retention requirements are required for research on human subjects with potential long-term effects, research with long-term environmental effects, or research considered of national or international significance, importance, or controversy. If the data from this research project falls into one of these categories, contact University Records for advice on long-term retention.

If you have any queries about your ethics approval, or require any amendments to your research in the future, please do not hesitate to contact Research.Ethics@uts.edu.au.

Yours sincerely

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Dr Tim Luckett
(Acting) Chairperson
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UTS CRICOS PROVIDER CODE 00099F

2 October 2019

Dr John McAloon
Faculty of Health
UNIVERSITY OF TECHNOLOGY SYDNEY

Dear John,

UTS HREC ETH19-3741 – MCALOON (for PAPALOIZOU) – "Children's Trajectories as a Function of Early Child Care" [for UTS HREC REF NO. ETH18-2307]

The HREC Expedited Review Committee reviewed your amendment application for your project titled, "Children's Trajectories as a Function of Early Child Care", and agreed that the amendments meet the requirements of the NHMRC National Statement on Ethical Conduct In Human Research (2007), and has been approved on that basis. You are therefore authorised to commence activities as outlined in your application on the condition that an amendment to SERAP approval is obtained by the researchers and forwarded to the HREC when received.

Please note that in future, amendments to ratified ethics applications need only be submitted to the Ethics Secretariat by email.

This amendment is subject to the standard conditions outlined in your original letter of approval. You are reminded that this letter constitutes ethics approval only. This research project must also be undertaken in accordance with all UTS policies and guidelines including the Research Management Policy (http://www.gsu.uts.edu.au/policies/research-management-policy.html)

You should consider this your official letter of approval. If you require a hardcopy please contact the Research Ethics Officer (Research.Ethics@uts.edu.au).
To access this application, please follow the URLs below:
* if accessing within the UTS network: https://rm.uts.edu.au
* if accessing outside of UTS network: https://vpn.uts.edu.au, and click on " RM6 – Production " after logging in.

If you wish to make any further changes to your research, please contact the Research Ethics Secretariat in the Research Office on 02 9514 9772.

In the meantime I take this opportunity to wish you well with the remainder of your research.

Yours sincerely,

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prior to publication.

Professor Beata Bajorek
Chairperson
UTS Human Research Ethics Committee

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UTS CRICOS PROVIDER CODE 00099F

6 March 2020

Dr John McAloon
Faculty of Health
UNIVERSITY OF TECHNOLOGY SYDNEY

Dear John,

UTS HREC ETH20-4621 – MCALOON (for PAPALOIZOU) – "Children's Trajectories as a Function of Early Child Care" [for UTS HREC REF NO. ETH18-2307]

The UTS Human Research Ethics Expedited Review Committee reviewed your amendment application for your project and agreed that the amendments meet the requirements of the NHMRC National Statement on Ethical Conduct In Human Research (2007). I am pleased to inform you that the Committee has approved your request to amend the protocol, on the condition that evidence of SERAP approval is provided once obtained, as follows:

1. In our original application to the ethics committee, we stated that teachers would be asked to participate at time 3. Participants were told in the PIS that teachers would participate in "future stages of the research". We would now like teachers to participate at time 2. We propose this amendment.

2. We propose asking participants to complete two of the included measures (already approved in previous versions of this application) two weeks after the second data point.

This amendment is subject to the standard conditions outlined in your original letter of approval.

You are reminded that this letter constitutes ethics approval only. This research project must also be undertaken in accordance with all UTS policies and guidelines including the Research Management Policy.

You should consider this your official letter of approval. If you require a hardcopy please contact the Ethics Secretariat.

To access this application, please click here, a copy of your application has also been attached to this email.

If you wish to make any further changes to your research, please contact the Research Ethics Secretariat on 02 9514 9772.

In the meantime I take this opportunity to wish you well with the remainder of your research.

Yours sincerely,

Production Note:
Signature removed
prior to publication.

Professor Beata Bajorek
Chairperson
UTS Human Research Ethics Committee

UTS UNIVERSITY OF TECHNOLOGY SYDNEY

Human Research Ethics Committee
Ethics Secretariat
C/O Research Office
15 Broadway, Ultimo NSW 2007

T: +61 2 9514 9772
Research.Ethics@uts.edu.au

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Broadway
NSW 2007 Australia
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UTS CRICOS PROVIDER CODE 00099F

1 October 2020

Dr John McAloon
Faculty of Health
UNIVERSITY OF TECHNOLOGY SYDNEY

Dear John,

UTS HREC ETH20-5241 – MCALOON (for PAPALOIZOU) – "Children's Trajectories as a Function of Early Child Care" [for UTS HREC REF NO. ETH18-2307]

The UTS Human Research Ethics Expedited Review Committee reviewed your amendment application for your project and agreed that the amendments meet the requirements of the NHMRC National Statement on Ethical Conduct In Human Research (2007). I am pleased to inform you that the Committee has approved your request to amend the protocol as follows:

"We would like to add a few questions to assess the impact of COVID-19 on participants work, school, and family life. The new questions are in line with the original aims and objectives of the study. Prof Jane Maguire has been added as the primary supervisor."

This amendment is subject to the standard conditions outlined in your original letter of approval.

You are reminded that this letter constitutes ethics approval only. This research project must also be undertaken in accordance with all UTS policies and guidelines including the Research Management Policy.

You should consider this your official letter of approval. If you require a hardcopy please contact the Ethics Secretariat.

To access this application, please click here, a copy of your application has also been attached to this email.

If you wish to make any further changes to your research, please contact the Research Ethics Secretariat on 02 9514 9772.

In the meantime I take this opportunity to wish you well with the remainder of your research.

Yours sincerely,

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prior to publication.

Professor Beata Bajorek
Chairperson
UTS Human Research Ethics Committee

Appendix B

Participant Engagement

-Participant Information Sheet and Consent Form

-Study Flyer

UTS UNIVERSITY OF TECHNOLOGY SYDNEY

PARTICIPANT INFORMATION SHEET

CHILDREN'S TRAJECTORIES AS A FUNCTION OF EARLY CHILD CARE
(UTS HREC APPROVAL NUMBER ETH18-2307, Amendment: ETH19-3741; ETH20-4621; ETH20-5241)

WHO IS DOING THE RESEARCH?

My name is Andrea Papaloizou and I am a student at UTS. My primary supervisor is Dr. John McAloon who can be contacted at john.mcaloon@uts.edu.au *or 9514 7240.*

WHAT IS THIS RESEARCH ABOUT?

This research will investigate which early childcare arrangements (i.e. formal childcare arrangements or informal childcare arrangements) produces the most beneficial psychological and behavioural outcomes for children with different psychological characteristics. This will be done by comparing responses from parents of children attending home based vs centre based care. We also aim to identify which aspects of these environments are most influential on children's social, emotional and behavioural functioning. This study is being conducted over an 12 month period in order to assess whether children's outcomes stay the same or change over time.

FUNDING

No funding has been received for the current study.

WHY HAVE I BEEN ASKED?

You have been invited to participate in this study because your child is not attending kindergarten at a NSW Dept. of Education primary school in 2019. However, you intend your child to start primary school in 2020.

If your child is in a formal childcare arrangement (e.g. day care, preschool, long day care), they will need to be currently enrolled in that environment for at least 6 months, involving attendance at least six hours per week. If your child is in a home based care arrangement, then your child's care may be primarily from a biological parent, but may also include informal care from relatives (e.g. grandparents) and non-relatives (e.g. nannies, friends and neighbours).

IF I SAY YES, WHAT WILL IT INVOLVE?

If you decide to participate, I will invite you to answer an online questionnaire that will take approximately 30 minutes to complete. This questionnaire will ask questions about your child's emotional, behavioural and social functioning, along with some questions about their current early childcare arrangement. A number of items are presented in this research to generate a global impression of your child. Some of these items may appear relevant for your child, whereas others may appear irrelevant or intrusive. Regardless, we appreciate your time in answering them.

You will need to complete this same online questionnaire three times. The first time will be at the end of the academic year in 2019, the second time will be at the beginning of the 2020 academic year, and the third time point will be at approximately August 2020.

Your child's primary school teacher may participate in future stages of the project. If you agree to this, you will be asked to provide consent to allow us to contact your child's principal and school teacher after you've completed the third and final online questionnaire. We will notify the teacher that your child has been involved in the study, and we will share your unique participant identifying code with them so they can access the study. At no point will your child's teacher be able to access any of the information that you have provided us with through these online questionnaires.

To thank you for participating, you will go in the draw to win 1 of 10 $100 Coles Myer gift cards per each of the data collection time points.

ARE THERE ANY RISKS/INCONVENIENCE?

Yes, there are some risks/inconvenience. They are: you may experience feelings of fatigue and repetition from completing the online questionnaire, you might feel uncomfortable recalling information

about your child's psychological wellbeing, and you may feel inconvenience and burdensome spending time completing these online questionnaires three times over the 12 month period. We also acknowledge that parents of young children have significant demands on their time. We suggest that the online questionnaires be completed when existing parental responsibilities are most manageable, such as when your child is asleep.

If at any point you feel distressed throughout this study, crisis support is available. For support, please call **Parent Line 1300 1300 52** (9am to 9pm Monday – Friday, 4pm to 9pm Saturday and Sunday) or **Lifeline 13 11 14** (24 hours). If you are in an emergency, please contact **emergency services on triple zero, 000.** You can also contact the chief investigator, Dr. John McAloon at john.mcaloon@uts.edu.au *or 9514 7240,* should you require a referral to access specialist help for your family.

DO I HAVE TO SAY YES?

Participation in this study is voluntary. It is completely up to you whether or not you decide to take part.

WHAT WILL HAPPEN IF I SAY NO?

If you decide not to participate, it will not affect your relationship with the researchers or the University of Technology Sydney. If you wish to withdraw from the study once it has started, you can do so at any time without giving a reason, by contacting Dr. John McAloon at john.mcaloon@uts.edu.au *or 9514 7240*. Alternatively, you can contact Andrea Papaloizou at andrea.papaloizou@student.uts.edu.au.

You are also not required to participate at the second or third time points in the study if you choose not to. If you withdraw from the study at any point, the online data that you have provided will be erased. However, it may not be possible to withdraw your data from the study results if these have already had your identifying details removed.

CONFIDENTIALITY

By signing the consent form you consent to the research team collecting and using personal information about you for the research project. All this information will be treated confidentially. After consenting to participate, you will be assigned a unique participant identifying code (UPIC). Only the research team on this study will have access to the data provided. Your information will only be used for the purpose of this research project and it will only be disclosed with your permission, except as required by law.

We plan to publish the results in an academic journal article for research purposes. In any publication, information will be provided in such a way that you cannot be identified.

WHAT IF I HAVE CONCERNS OR A COMPLAINT?

If you have concerns about the research, please feel free to contact us via email on john.mcaloon@uts.edu.au or andrea.papaloizou@student.uts.edu.au. Alternatively you can contact Dr. John McAloon via phone on *9514 7240.*

You will be given a copy of this form to keep.

NOTE:
This study has been approved by the University of Technology Sydney Human Research Ethics Committee [UTS HREC]. If you have any concerns or complaints about any aspect of the conduct of this research, please contact the Ethics Secretariat on ph.: +61 2 9514 2478 or email: Research.Ethics@uts.edu.au], and quote the UTS HREC reference number. Any matter raised will be treated confidentially, investigated and you will be informed of the outcome.

If at any point you feel distressed throughout this study, crisis support is available. For support, please call **Parent Line 1300 1300 52** (9am to 9pm Monday – Friday, 4pm to 9pm Saturday and Sunday) or **Lifeline 13 11 14** (24 hours). If you are in an emergency, please contact **emergency services on triple zero, 000.**

CONSENT FORM
CHILDREN'S TRAJECTORIES AS A FUNCTION OF EARLY CHILD CARE
(*UTS HREC APPROVAL NUMBER ETH18-2307, Amendment: ETH19-3741; ETH20-4621; ETH20-5241*)

I _____ *[participant's name]* agree to participate in the research project *Children's Trajectories as a Function of Early Child Care [and include the UTS HREC approval reference number when obtained]* being conducted by *Andrea Papaloizou, 15 Broadway Ultimo NSW 2007 and 9514 7240*. I understand that funding for this research has been provided by *[if applicable]*.

I have read the Participant Information Sheet or someone has read it to me in a language that I understand.

I understand the purposes, procedures and risks of the research as described in the Participant Information Sheet.

I have had an opportunity to ask questions and I am satisfied with the answers I have received.

I freely agree to participate in this research project as described and understand that I am free to withdraw at any time without affecting my relationship with the researchers or the University of Technology Sydney.

I understand that I will be given a signed copy of this document to keep.

I agree that the research data gathered from this project may be published in a form that does not identify me in any way.

I am aware that I can contact *Andrea Papaloizou or Dr. John McAloon* if I have any concerns about the research.

_____ ____/____/____
Name and Signature [participant] Date

_____ ____/____/____
Name and Signature [researcher or delegate] Date

If at any point you feel distressed throughout this study, crisis support is available. For support, please call **Parent Line 1300 1300 52** (9am to 9pm Monday – Friday, 4pm to 9pm Saturday and Sunday) or **Lifeline 13 11 14** (24 hours). If you are in an emergency, please contact **emergency services on triple zero, 000**

PARTICIPATE IN A RESEARCH STUDY!

We are currently conducting research investigating the relationship between Early Child Care Arrangements (ECCAs) and psychological and behavioural outcomes. We are interested if this varies for different children.

WE NEED YOUR HELP!

Participation includes completing an online questionnaire three times over 12 months. This will take approximately 20-25 minutes of your time.

To thank you for participating, you will go in the draw to win 1 of 10 $100 Coles Myer gift cards at each point of data collection.

HOW TO PARTICIPATE:

Please visit http://bit.ly/childrenseccas

or scan the QR code to access the online questionnaire.

To learn more about the research study, please contact Andrea Papaloizou at andrea.papaloizou@student.uts.edu.au or Dr. John McAloon at john.mcaloon@uts.edu.au

@utsresearch_childrenseccas

@utschildrenecca

@utsresearchchildrenseccas

This proposal has been approved by the UTS Human Research Ethics Committee (HREC#: ETH18-2307, ETH19-3741) & NSW Dept of Education (SERAP#: 2018769)

Appendix C

Tables of Results

-Table 5.2

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-Table 5.13

Table 5.2

Overall Difference in Main Study Outcomes and at Each Time Point, With P-Values for Overall Difference and Interaction Between Time and Early Child Care Arrangement.

Outcome	Time Point	Difference In Score (95% CI)	P-Value Overall/Time point	P-Value Interaction	Difference (Adjusted)	P-Value Overall/Time point (Adjusted)	P-Value Interaction (Adjusted)
Emotional Functioning (Internalising Scale - CBCL)	Overall Difference	1.19 (-2.07 - 4.46)	0.47		2.65 (-0.62 - 5.91)	0.11	
	Time Point 1	0.15 (-3.16 - 3.46)	0.93	0.15	1.69 (-1.68 - 5.06)	0.32	0.15
	Time Point 2	3.25 (-0.82 - 7.31)	0.12		4.70 (0.67 - 8.74)	0.0225	
	Time Point 3	0.19 (-4.02 - 4.40)	0.93		1.55 (-2.64 - 5.74)	0.47	
Behavioural Functioning (Externalising Scale - CBCL)	Overall Difference	0.29 (-2.58 - 3.15)	0.84		1.12 (-1.86 - 4.09)	0.46	
	Time Point 1	-1.23 (-4.17 - 1.72)	0.41	0.25	-0.35 (-3.44 - 2.75)	0.83	0.28
	Time Point 2	1.12 (-2.52 - 4.75)	0.55		1.94 (-1.76 - 5.64)	0.30	
	Time Point 3	0.97 (-2.69 - 4.64)	0.60		1.75 (-1.98 - 5.48)	0.36	
Social Functioning (PKBS-2)	Overall Difference	1.83 (-1.99 - 5.65)	0.35		0.87 (-3.10 - 4.84)	0.67	
	Time Point 1	4.13 (0.28 - 7.98)	0.0356	0.0415	3.01 (-1.03 - 7.05)	0.14	0.06
	Time Point 2	0.36 (-4.05 - 4.78)	0.87		-0.52 (-5.05 - 4.00)	0.82	
	Time Point 3	1.00 (-3.49 - 5.49)	0.66		0.13 (-4.47 - 4.73)	0.96	

Note. Reference for estimate is informal care (score > 0 means a higher score in formal care). Adjusted results include carer education level, household income, household status, child gender, and parent mental health history.

Table 5.3

Overall Difference in Main Study Outcomes and at Each Time Point, With P-Values for Overall Difference and Interaction Between Time and Psychological Profile.

Outcome	Psychological Profile	Time Point	Difference In Score (95% CI)	P-Value Overall/ Time point	P-Value Interaction	Difference (Adjusted)	P-Value Overall / Time point (Adjusted)	P-Value Interaction (Adjusted)
Emotional Functioning (Internalising Scale - CBCL)	Internalisers	Overall Difference	9.94 (6.83 - 13.06)	<.0001		9.09 (5.90 - 12.29)	<.0001	
		Time Point 1	14.94 (11.67 - 18.22)	<.0001	0.0024	13.98 (10.61 - 17.36)	<.0001	0.0035
		Time Point 2	8.00 (3.77 - 12.23)	0.0002		7.16 (2.89 - 11.44)	0.0011	
		Time Point 3	6.88 (2.28 - 11.47)	0.0035		6.14 (1.50 - 10.77)	0.0097	
Emotional Functioning (Internalising Scale - CBCL)	Externalisers	Overall Difference	1.49 (-2.09 - 5.08)	0.41		1.91 (-1.74 - 5.57)	0.30	
		Time Point 1	1.88 (-1.90 - 5.67)	0.33	0.0024	2.40 (-1.45 - 6.25)	0.22	0.0035
		Time Point 2	0.94 (-3.86 - 5.74)	0.70		1.22 (-3.63 - 6.07)	0.62	
		Time Point 3	1.66 (-3.70 - 7.01)	0.54		2.11 (-3.28 - 7.50)	0.44	
Emotional Functioning (Internalising Scale - CBCL)	Combined	Overall Difference	17.89 (14.83 - 20.94)	<.0001		16.66 (13.42 - 19.90)	<.0001	
		Time Point 1	21.23 (18.04 - 24.43)	<.0001	0.0024	19.94 (16.58 - 23.31)	<.0001	0.0035
		Time Point 2	16.83 (12.62 - 21.04)	<.0001		15.62 (11.27 - 19.96)	<.0001	
		Time Point 3	15.60 (11.13 - 20.07)	<.0001		14.42 (9.84 - 19.01)	<.0001	
Behavioural Functioning (Externalising Scale - CBCL)	Internalisers	Overall Difference	-0.67 (-3.49 - 2.15)	0.64		-1.59 (-4.44 - 1.26)	0.27	

Outcome	Psychological Profile	Time Point	Difference In Score (95% CI)	P-Value Overall/ Time point	P-Value Interaction	Difference (Adjusted)	P-Value Overall / Time point (Adjusted)	P-Value Interaction (Adjusted)
		Time Point 1	2.23 (-0.83 - 5.29)	0.15	0.0184	0.98 (-2.12 - 4.07)	0.54	0.0296
		Time Point 2	-2.47 (-6.39 - 1.46)	0.22		-3.27 (-7.19 - 0.66)	0.10	
		Time Point 3	-1.76 (-5.70 - 2.18)	0.38		-2.49 (-6.45 - 1.47)	0.22	
Behavioural Functioning (Externalising Scale - CBCL)	Externalisers	Overall Difference	10.35 (7.06 - 13.64)	<.0001		9.75 (6.47 - 13.03)	<.0001	
		Time Point 1	13.82 (10.28 - 17.36)	<.0001	0.0184	13.29 (9.76 - 16.82)	<.0001	0.0296
		Time Point 2	9.32 (4.85 - 13.78)	<.0001		8.47 (4.01 - 12.93)	0.0002	
		Time Point 3	7.91 (3.14 - 12.68)	0.0012		7.49 (2.74 - 12.24)	0.0021	
Behavioural Functioning (Externalising Scale - CBCL)	Combined	Overall Difference	14.85 (12.01 - 17.70)	<.0001		14.76 (11.82 - 17.71)	<.0001	
		Time Point 1	16.45 (13.47 - 19.44)	<.0001	0.0184	16.32 (13.23 - 19.41)	<.0001	0.0296
		Time Point 2	15.82 (11.89 - 19.75)	<.0001		15.63 (11.63 - 19.63)	<.0001	
		Time Point 3	12.28 (8.16 - 16.41)	<.0001		12.34 (8.16 - 16.52)	<.0001	
Social Functioning (PKBS-2)	Internalisers	Overall Difference	-4.13 (-8.34 - 0.08)	0.05		-4.42 (-8.69 - -0.15)	0.0423	
		Time Point 1	-5.58 (-9.91 - -1.24)	0.0119	0.85	-5.72 (-10.1 - -1.33)	0.0110	0.89
		Time Point 2	-2.82 (-7.89 - 2.25)	0.28		-3.17 (-8.27 - 1.94)	0.22	
		Time Point 3	-4.00 (-9.16 - 1.16)	0.13		-4.38 (-9.59 - 0.82)	0.10	
Social Functioning (PKBS-2)	Externalisers	Overall Difference	-7.81 (-12.7 - -2.92)	0.0019		-8.96 (-13.8 - -4.08)	0.0004	
		Time Point 1	-7.06 (-12.1 - -2.05)	0.0060	0.85	-8.32 (-13.3 - -3.30)	0.0012	0.89

Outcome	Psychological Profile	Time Point	Difference In Score (95% CI)	P-Value Overall/ Time point	P-Value Interaction	Difference (Adjusted)	P-Value Overall / Time point (Adjusted)	P-Value Interaction (Adjusted)
		Time Point 2	-8.51 (-14.3 - -2.70)	0.0043		-9.59 (-15.4 - -3.78)	0.0013	
		Time Point 3	-7.86 (-13.9 - -1.79)	0.0113		-8.97 (-15.0 - -2.92)	0.0038	
Social Functioning (PKBS-2)	Combined	Overall Difference	-19.6 (-23.8 - -15.4)	<.0001		-19.0 (-23.3 - -14.6)	<.0001	
		Time Point 1	-19.6 (-23.8 - -15.3)	<.0001	0.85	-18.9 (-23.3 - -14.5)	<.0001	0.89
		Time Point 2	-19.9 (-25.0 - -14.9)	<.0001		-19.3 (-24.5 - -14.1)	<.0001	
		Time Point 3	-19.3 (-24.5 - -14.1)	<.0001		-18.8 (-24.1 - -13.4)	<.0001	

Note. Reference for estimate is normal profile (score > 0 means a higher score in specified profile vs. normal). Adjusted results include carer education level, household income, household status, child gender, and parent mental health history

Table 5.4

Overall Difference in Main Study Outcomes and at Each Time Point, With P-Values for Interaction Between Time, Psychological Profile, and Early Child Care Arrangement.

Unadjusted/ Adjusted	Outcome	Psychological Profile	Time Point	Informal Care	Formal Care	Interaction P-Value
Unadjusted	Emotional Functioning (Internalising Scale - CBCL)	Internalisers	Time point 1	12.76 (6.25 - 19.27)	15.73 (11.95 - 19.52)	0.14
			Time point 2	13.31 (5.15 - 21.48)	6.75 (1.77 - 11.73)	
			Time point 3	3.39 (-5.30 - 12.08)	8.41 (3.00 - 13.83)	
		Externalisers	Time point 1	0.61 (-6.26 - 7.49)	2.57 (-1.98 - 7.12)	
			Time point 2	0.54 (-7.70 - 8.79)	3.60 (-2.47 - 9.68)	
			Time point 3	3.03 (-5.73 - 11.80)	0.37 (-6.55 - 7.30)	
		Combined	Time point 1	20.94 (15.19 - 26.69)	21.49 (17.63 - 25.35)	
			Time point 2	21.65 (13.63 - 29.66)	15.97 (10.97 - 20.96)	
			Time point 3	14.15 (6.14 - 22.17)	16.55 (11.12 - 21.97)	
	Behavioural Functioning (Externalising Scale - CBCL)	Internalisers	Time point 1	1.33 (-4.75 - 7.41)	2.53 (-1.00 - 6.07)	0.0064
			Time point 2	2.93 (-4.65 - 10.52)	-4.66 (-9.25 - -0.07)	
			Time point 3	-7.56 (-15.5 - 0.40)	0.14 (-4.35 - 4.64)	
		Externalisers	Time point 1	13.05 (6.63 - 19.47)	14.16 (9.91 - 18.40)	
			Time point 2	2.65 (-5.01 - 10.31)	14.81 (9.20 - 20.42)	
			Time point 3	3.56 (-4.48 - 11.60)	10.56 (4.61 - 16.50)	
		Combined	Time point 1	16.42 (11.05 - 21.80)	16.45 (12.84 - 20.05)	
			Time point 2	17.66 (10.23 - 25.09)	15.37 (10.72 - 20.01)	
			Time point 3	11.79 (4.47 - 19.12)	12.43 (7.44 - 17.42)	

Unadjusted/ Adjusted	Outcome	Psychological Profile	Time Point	Informal Care	Formal Care	Interaction P-Value
	Social Functioning (PKBS-2)	Internalisers	Time point 1	-8.26 (-16.9 - 0.33)	-4.57 (-9.57 - 0.43)	0.0074
			Time point 2	-9.99 (-19.9 - -0.11)	-0.63 (-6.52 - 5.25)	
			Time point 3	2.96 (-7.91 - 13.83)	-5.64 (-11.5 - 0.16)	
		Externalisers	Time point 1	-7.64 (-16.7 - 1.44)	-6.52 (-12.5 - -0.52)	
			Time point 2	-10.4 (-20.5 - -0.27)	-9.61 (-16.8 - -2.45)	
			Time point 3	-9.67 (-20.2 - 0.80)	-7.82 (-15.3 - -0.37)	
		Combined	Time point 1	-19.6 (-27.1 - -12.0)	-19.2 (-24.3 - -14.2)	
			Time point 2	-25.0 (-34.4 - -15.6)	-18.7 (-24.7 - -12.7)	
			Time point 3	-25.8 (-35.1 - -16.4)	-16.5 (-22.8 - -10.3)	
Adjusted	Emotional Functioning (Internalising Scale - CBCL)	Internalisers	Time point 1	12.79 (6.23 - 19.34)	14.42 (10.52 - 18.32)	0.13
			Time point 2	13.52 (5.33 - 21.71)	5.58 (0.55 - 10.61)	
			Time point 3	3.64 (-5.07 - 12.35)	7.37 (1.91 - 12.82)	
		Externalisers	Time point 1	2.31 (-4.90 - 9.52)	2.67 (-1.89 - 7.22)	
			Time point 2	1.55 (-6.99 - 10.09)	3.79 (-2.27 - 9.85)	
			Time point 3	4.35 (-4.67 - 13.38)	0.64 (-6.26 - 7.53)	
		Combined	Time point 1	20.78 (14.63 - 26.93)	19.65 (15.68 - 23.62)	
			Time point 2	21.28 (13.06 - 29.51)	14.38 (9.32 - 19.44)	
			Time point 3	13.79 (5.57 - 22.02)	15.02 (9.55 - 20.49)	
	Behavioural Functioning (Externalising Scale - CBCL)	Internalisers	Time point 1	0.68 (-5.33 - 6.70)	1.04 (-2.54 - 4.61)	0.0064
			Time point 2	2.89 (-4.62 - 10.40)	-5.73 (-10.3 - -1.14)	
			Time point 3	-7.35 (-15.3 - 0.55)	-0.92 (-5.43 - 3.60)	
		Externalisers	Time point 1	11.49 (4.88 - 18.11)	13.91 (9.73 - 18.09)	

Unadjusted/ Adjusted	Outcome	Psychological Profile	Time Point	Informal Care	Formal Care	Interaction P-Value
			Time point 2	0.89 (-6.93 - 8.71)	14.29 (8.75 - 19.82)	
			Time point 3	2.29 (-5.88 - 10.46)	10.40 (4.53 - 16.26)	
		Combined	Time point 1	16.73 (11.09 - 22.37)	16.23 (12.59 - 19.87)	
			Time point 2	18.30 (10.76 - 25.84)	14.95 (10.31 - 19.59)	
			Time point 3	12.51 (5.08 - 19.95)	12.32 (7.35 - 17.29)	
	Social Functioning (PKBS-2)	Internalisers	Time point 1	-9.63 (-18.2 - -1.08)	-4.30 (-9.40 - 0.80)	0.0092
			Time point 2	-11.5 (-21.3 - -1.65)	-0.54 (-6.49 - 5.40)	
			Time point 3	1.39 (-9.44 - 12.22)	-5.59 (-11.5 - 0.29)	
		Externalisers	Time point 1	-10.6 (-20.0 - -1.12)	-7.14 (-13.1 - -1.20)	
			Time point 2	-12.7 (-23.2 - -2.26)	-10.2 (-17.3 - -3.11)	
			Time point 3	-12.1 (-22.8 - -1.30)	-8.41 (-15.8 - -1.04)	
		Combined	Time point 1	-21.0 (-29.1 - -13.0)	-17.9 (-23.1 - -12.8)	
			Time point 2	-26.2 (-35.8 - -16.5)	-17.6 (-23.7 - -11.6)	
			Time point 3	-26.9 (-36.6 - -17.3)	-15.5 (-21.9 - -9.22)	

Note. Reference for estimate is normal profile (score > 0 means a higher score in specified profile vs. normal). Adjusted results include carer education level, household income, household status, child gender, and parent mental health history.

Table 5.5

Overall Difference in Teacher-Reported Study Outcomes by Early Child Care Arrangement Type at Time Point 3.

Outcome	Difference In Score (95% CI)	Difference (Adjusted)	P-Value (Unadjusted)	P-Value (Adjusted)
Emotional Functioning (Internalising Scale - CBCL)	0.77 (-6.32 - 7.85)	0.36 (-10.8 - 11.50)	0.83	0.95
Behavioural Functioning (Externalising Scale - CBCL)	3.95 (-1.30 - 9.20)	-0.02 (-7.78 - 7.74)	0.14	1.00
Social Functioning (PKBS-2)	-4.64 (-11.1 - 1.83)	-3.61 (-12.8 - 5.57)	0.16	0.43

Note. Reference for estimate is informal care (score > 0 means a higher score in formal care). Adjusted results include carer education level, household income, household status, child gender, and parent mental health history

Table 5.6

Overall Difference in Teacher-Reported Study Outcomes by Psychological Profile at Time Point 3.

Outcome	Psychological Profile	Difference In Score (95% CI)	P-Value Difference (Unadjusted)	P-Value Overall (Unadjusted)	Difference (Adjusted)	P-Value Difference (Adjusted)	P-Value Overall (Adjusted)
Emotional Functioning (Internalising Scale - CBCL)	Combined	3.44 (-5.67 - 12.55)	0.45	0.0171	2.65 (-12.3 - 17.63)	0.72	0.14
Emotional Functioning (Internalising Scale - CBCL)	Externalisers	-0.31 (-7.99 - 7.38)	0.94		-3.16 (-14.7 - 8.40)	0.58	
Emotional Functioning (Internalising Scale - CBCL)	Internalisers	12.53 (4.84 - 20.21)	0.0021		12.16 (1.16 - 23.16)	0.0316	
Behavioural Functioning (Externalising Scale - CBCL)	Combined	1.25 (-6.52 - 9.02)	0.75	0.67	3.57 (-7.44 - 14.58)	0.51	0.41
Behavioural Functioning (Externalising Scale - CBCL)	Externalisers	-3.50 (-10.1 - 3.05)	0.29		-4.44 (-12.9 - 4.06)	0.29	
Behavioural Functioning (Externalising Scale - CBCL)	Internalisers	0.67 (-5.88 - 7.22)	0.84		4.54 (-3.54 - 12.63)	0.26	
Social Functioning (PKBS-2)	Combined	-5.65 (-15.0 - 3.69)	0.23	0.36	-7.10 (-20.3 - 6.13)	0.28	0.44
Social Functioning (PKBS-2)	Externalisers	4.35 (-3.53 - 12.22)	0.27		6.02 (-4.19 - 16.23)	0.24	
Social Functioning (PKBS-2)	Internalisers	0.85 (-7.03 - 8.72)	0.83		-1.59 (-11.3 - 8.12)	0.74	

Note. Reference for estimate is normal profile (score > 0 means a higher score in specified profile vs. normal). Adjusted results include carer education level, household income, household status, child gender, and parent mental health history

Table 5.7

Overall Association (Beta Coefficient) Between COVID-19 Disruption Scores and Outcomes.

Unadjusted/ Adjusted	Outcome	Covid-19 Disruption Subscale	Beta Coefficient (95% CI), Single	P-Value, Single	Beta Coefficient (95% CI), Multiple	P-Value, Multiple
Adjusted	Behavioural Functioning (Externalising Scale - CBCL)	COVID-19 Family Subscale	0.68 (0.05 - 1.30)	0.0340	0.83 (0.10 - 1.56)	0.0269
		COVID-19 Job Subscale	0.07 (-0.29 - 0.42)	0.70	-0.05 (-0.41 - 0.32)	0.80
		COVID-19 School Subscale	-0.04 (-0.60 - 0.52)	0.89	-0.20 (-0.84 - 0.45)	0.55
	Emotional Functioning (Internalising Scale - CBCL)	COVID-19 Family Subscale	1.23 (0.53 - 1.92)	0.0008	1.05 (0.25 - 1.84)	0.0106
		COVID-19 Job Subscale	0.25 (-0.17 - 0.66)	0.24	0.12 (-0.29 - 0.53)	0.56
		COVID-19 School Subscale	0.21 (-0.43 - 0.85)	0.51	0.06 (-0.64 - 0.76)	0.87
	Social Functioning (PKBS-2)	COVID-19 Family Subscale	-0.88 (-1.58 - -0.19)	0.0132	-0.64 (-1.39 - 0.11)	0.09
		COVID-19 Job Subscale	-0.03 (-0.40 - 0.33)	0.85	0.08 (-0.29 - 0.45)	0.67
		COVID-19 School Subscale	-0.42 (-1.05 - 0.20)	0.18	-0.22 (-0.89 - 0.44)	0.50
Unadjusted	Behavioural Functioning (Externalising Scale - CBCL)	COVID-19 Family Subscale	0.65 (0.06 - 1.24)	0.0314	0.67 (0.01 - 1.33)	0.0478
		COVID-19 Job Subscale	0.03 (-0.30 - 0.37)	0.84	-0.05 (-0.39 - 0.29)	0.79
		COVID-19 School Subscale	0.12 (-0.41 - 0.64)	0.66	0.05 (-0.54 - 0.64)	0.86
	Emotional Functioning (Internalising Scale - CBCL)	COVID-19 Family Subscale	1.19 (0.52 - 1.86)	0.0006	1.15 (0.42 - 1.87)	0.0023
		COVID-19 Job Subscale	0.18 (-0.21 - 0.58)	0.36	0.10 (-0.28 - 0.48)	0.59
		COVID-19 School Subscale	0.23 (-0.36 - 0.81)	0.44	-0.01 (-0.63 - 0.62)	0.99
	Social Functioning (PKBS-2)	COVID-19 Family Subscale	-0.97 (-1.69 - -0.25)	0.0090	-0.83 (-1.64 - -0.03)	0.0433
		COVID-19 Job Subscale	0.13 (-0.29 - 0.54)	0.55	0.24 (-0.17 - 0.66)	0.25
		COVID-19 School Subscale	-0.56 (-1.20 - 0.08)	0.09	-0.42 (-1.14 - 0.30)	0.25

Unadjusted/ Adjusted	Outcome	Covid-19 Disruption Subscale	Beta Coefficient (95% CI), Single	P-Value, Single	Beta Coefficient (95% CI), Multiple	P-Value, Multiple

Note. Single means each COVID-19 disruption variable in a separate regression model, multiple means they are all included in the same model

Adjusted results include carer education level, household income, household status, child gender, and parent mental health history

Table 5.8

Beta Coefficient for Association Between Perceived Quality of Formal Care Each Time Point, With P-Values for Each Time Point and Heterogeneity Over Time.

Outcome	Time Point	Beta Coefficient (95% CI) (Unadjusted)	P-Value at Timepoint (Unadjusted)	P-Value Interaction (Unadjusted)	Beta Coefficient (95% CI) (Adjusted)	P-Value at Timepoint (Adjusted)	P-Value Interaction (Adjusted)
Emotional Functioning (Internalising Scale - CBCL)	Time Point 1	0.54 (0.12 - 0.96)	0.0120	0.29	0.60 (0.14 - 1.06)	0.0116	0.29
	Time Point 2	0.24 (-0.21 - 0.68)	0.29		0.29 (-0.19 - 0.77)	0.23	
	Time Point 3	0.39 (-0.06 - 0.83)	0.09		0.44 (-0.04 - 0.92)	0.07	
Behavioural Functioning (Externalising Scale - CBCL)	Time Point 1	0.60 (0.25 - 0.96)	0.0010	0.94	0.59 (0.20 - 0.98)	0.0034	0.94
	Time Point 2	0.62 (0.25 - 1.00)	0.0012		0.61 (0.21 - 1.02)	0.0033	
	Time Point 3	0.66 (0.31 - 1.01)	0.0003		0.64 (0.25 - 1.03)	0.0014	
Social Functioning (PKBS-2)	Time Point 1	-0.83 (-1.18 - -0.47)	<.0001	0.32	-0.87 (-1.27 - -0.47)	<.0001	0.33
	Time Point 2	-0.65 (-1.02 - -0.28)	0.0007		-0.70 (-1.11 - -0.28)	0.0011	
	Time Point 3	-0.90 (-1.25 - -0.54)	<.0001		-0.95 (-1.35 - -0.54)	<.0001	

Note. A positive association means a higher outcome score for those with a higher quality of care score. Adjusted results include carer education level, household income, household status, child gender, and parent mental health history.

Table 5.9

Beta Coefficient for Association Between Perceived Quality of Home Environment at Each Time Point, With P-Values for Each Time Point and Heterogeneity Over Time.

Early Child Care Arrangement	Outcome	Time point	Beta Coefficient (95% CI) (Unadjusted)	P-Value at Timepoint (Unadjusted)	P-Value Interaction (Unadjusted)	Beta Coefficient (95% CI) (Adjusted)	P-Value at Timepoint (Adjusted)	P-Value Interaction (Adjusted)
Informal	Emotional Functioning (Internalising Scale - CBCL)	Time Point 1	0.46 (-0.08 - 1.00)	0.09	0.45	0.27 (-0.31 - 0.85)	0.36	0.35
		Time Point 2	0.59 (-0.16 - 1.33)	0.12		0.47 (-0.30 - 1.24)	0.23	
		Time Point 3	0.88 (0.11 - 1.64)	0.0254		0.75 (-0.04 - 1.53)	0.06	
	Behavioural Functioning (Externalising Scale - CBCL)	Time Point 1	0.59 (0.10 - 1.08)	0.0189	0.30	0.49 (-0.08 - 1.05)	0.09	0.28
		Time Point 2	0.16 (-0.55 - 0.87)	0.65		0.03 (-0.72 - 0.79)	0.93	
		Time Point 3	0.66 (-0.02 - 1.34)	0.06		0.54 (-0.19 - 1.27)	0.14	
	Social Functioning (PKBS-2)	Time Point 1	-0.40 (-1.18 - 0.39)	0.31	0.96	-0.41 (-1.31 - 0.49)	0.36	0.96
		Time Point 2	-0.39 (-1.32 - 0.53)	0.40		-0.41 (-1.42 - 0.61)	0.43	
		Time Point 3	-0.47 (-1.41 - 0.46)	0.31		-0.49 (-1.52 - 0.54)	0.35	
Formal	Emotional Functioning (Internalising Scale - CBCL)	Time Point 1	0.48 (0.24 - 0.72)	0.0001	0.14	0.43 (0.18 - 0.68)	0.0010	0.15
		Time Point 2	0.30 (0.01 - 0.59)	0.0428		0.26 (-0.04 - 0.56)	0.09	
		Time Point 3	0.19 (-0.15 - 0.53)	0.27		0.15 (-0.20 - 0.49)	0.40	
	Behavioural Functioning (Externalising Scale - CBCL)	Time Point 1	0.52 (0.32 - 0.73)	<.0001	0.05	0.56 (0.33 - 0.78)	<.0001	0.06
		Time Point 2	0.40 (0.15 - 0.65)	0.0019		0.43 (0.17 - 0.69)	0.0012	

Early Child Care Arrangement	Outcome	Time point	Beta Coefficient (95% CI) (Unadjusted)	P-Value at Timepoint (Unadjusted)	P-Value Interaction (Unadjusted)	Beta Coefficient (95% CI) (Adjusted)	P-Value at Timepoint (Adjusted)	P-Value Interaction (Adjusted)
		Time Point 3	0.21 (-0.07 - 0.49)	0.14		0.25 (-0.04 - 0.54)	0.09	
	Social Functioning (PKBS-2)	Time Point 1	-0.72 (-0.96 - -0.48)	<.0001	0.08	-0.71 (-0.97 - -0.45)	<.0001	0.11
		Time Point 2	-0.59 (-0.87 - -0.31)	<.0001		-0.59 (-0.89 - -0.30)	0.0001	
		Time Point 3	-0.42 (-0.73 - -0.12)	0.0070		-0.43 (-0.76 - -0.11)	0.0090	

Note. A positive association means a higher outcome score for those with a higher quality of care score. Adjusted results include carer education level, household income, household status, child gender, and parent mental health history.

Table 5.10

Overall Difference in Change from Baseline in Main Study Outcomes and at Each Time Point, With P-Values for Overall Difference and Interaction Between Time and Early Child Care Arrangement.

Outcome	Time Point	Difference in Change from Baseline (95% CI) (Unadjusted)	P-value overall/ time point	P-value interaction	Difference in Change from Baseline (95% CI) (Adjusted)	P-Value Overall/ Time Point (Adjusted)	P-Value Interaction (Adjusted)
Emotional Functioning (Internalising Scale - CBCL)	Overall Difference	1.56 (-1.23 - 4.35)	0.27		1.07 (-2.02 - 4.17)	0.49	
	Timepoint 2	3.15 (-0.11 - 6.41)	0.06	0.09	2.68 (-0.84 - 6.21)	0.13	0.09
	Timepoint 3	-0.03 (-3.47 - 3.41)	0.99		-0.54 (-4.23 - 3.15)	0.77	
Behavioural Functioning (Externalising Scale - CBCL)	Overall Difference	1.93 (-0.68 - 4.54)	0.15		1.73 (-0.85 - 4.32)	0.19	
	Timepoint 2	2.24 (-0.88 - 5.36)	0.16	0.73	1.83 (-1.28 - 4.94)	0.25	0.91
	Timepoint 3	1.63 (-1.52 - 4.77)	0.31		1.64 (-1.50 - 4.77)	0.30	
Social Functioning (PKBS-2)	Overall Difference	-2.99 (-5.77 - -0.20)	0.0355		-2.31 (-5.23 - 0.61)	0.12	
	Timepoint 2	-3.16 (-6.39 - 0.06)	0.05	0.84	-2.43 (-5.79 - 0.94)	0.16	0.90
	Timepoint 3	-2.81 (-6.14 - 0.52)	0.10		-2.19 (-5.66 - 1.27)	0.21	

Note. Reference for estimate is informal care (score > 0 means a greater increase in change from baseline score in formal care, a negative score means a greater decrease in change from baseline in formal care than informal care). Adjusted results include carer education level, household income, household status, child gender, and parent mental health history.

Table 5.11

Overall Difference in Change from Baseline in Main Study Outcomes and at Each Time Point, With P-Values for Overall Difference and Interaction Between Time and Profile.

Outcome	Psychological Profile	Time Point	Difference in Score (95% CI) (Unadjusted)	P-Value Overall/ Time Point (Unadjusted)	P-Value Interaction (Unadjusted)	Difference in Score (95% CI) (Adjusted)	P-Value Overall/ Time Point (Adjusted)	P-Value Interaction (Adjusted)
Emotional Functioning (Internalising Scale - CBCL)	Internalisers	Overall Difference	-1.55 (-6.06 - 2.95)	0.50		-1.82 (-6.52 - 2.88)	0.44	
		Time Point 2	-2.79 (-7.94 - 2.36)	0.28	0.75	-3.00 (-8.33 - 2.32)	0.27	0.75
		Time Point 3	-0.32 (-6.17 - 5.54)	0.91		-0.64 (-6.64 - 5.36)	0.83	
Emotional Functioning (Internalising Scale - CBCL)	Externalisers	Overall Difference	0.05 (-4.09 - 4.18)	0.98		1.02 (-3.56 - 5.60)	0.66	
		Time Point 2	-0.56 (-5.31 - 4.19)	0.82		0.33 (-4.80 - 5.45)	0.90	
		Time Point 3	0.65 (-4.69 - 5.99)	0.81		1.71 (-3.99 - 7.42)	0.55	
Emotional Functioning (Internalising Scale - CBCL)	Combined	Overall Difference	3.32 (-1.86 - 8.50)	0.21		1.76 (-3.90 - 7.43)	0.54	
		Time Point 2	1.44 (-4.57 - 7.46)	0.64		-0.09 (-6.52 - 6.35)	0.98	
		Time Point 3	5.20 (-1.39 - 11.79)	0.12		3.61 (-3.35 - 10.57)	0.31	
Behavioural Functioning (Externalising Scale - CBCL)	Internalisers	Overall Difference	-3.42 (-6.59 - -0.25)	0.0344		-3.37 (-6.47 - -0.27)	0.0333	
		Time Point 2	-3.77 (-7.63 - 0.09)	0.06	0.81	-3.79 (-7.57 - -0.01)	0.0492	0.77
		Time Point 3	-3.07 (-6.99 - 0.84)	0.12		-2.94 (-6.84 - 0.95)	0.14	

Outcome	Psychological Profile	Time Point	Difference in Score (95% CI) (Unadjusted)	P-Value Overall/ Time Point (Unadjusted)	P-Value Interaction (Unadjusted)	Difference in Score (95% CI) (Adjusted)	P-Value Overall/ Time Point (Adjusted)	P-Value Interaction (Adjusted)
Behavioural Functioning (Externalising Scale - CBCL)	Externalisers	Overall Difference	0.72 (-3.45 - 4.89)	0.73		2.75 (-1.29 - 6.80)	0.18	
		Time Point 2	1.03 (-3.95 - 6.00)	0.68		2.83 (-2.03 - 7.69)	0.25	
		Time Point 3	0.41 (-4.77 - 5.59)	0.87		2.68 (-2.43 - 7.78)	0.30	
Behavioural Functioning (Externalising Scale - CBCL)	Combined	Overall Difference	4.37 (0.06 - 8.68)	0.0469		3.07 (-1.35 - 7.49)	0.17	
		Time Point 2	5.63 (0.51 - 10.75)	0.0316		4.36 (-0.87 - 9.60)	0.10	
		Time Point 3	3.12 (-2.21 - 8.44)	0.25		1.78 (-3.63 - 7.19)	0.52	
Social Functioning (PKBS-2)	Internalisers	Overall Difference	-4.61 (-9.45 - 0.22)	0.06		-0.21 (-3.84 - 3.42)	0.91	
		Time Point 2	-4.23 (-9.52 - 1.07)	0.12	0.96	0.09 (-4.16 - 4.35)	0.97	0.76
		Time Point 3	-5.00 (-10.4 - 0.39)	0.07		-0.51 (-4.92 - 3.90)	0.82	
Social Functioning (PKBS-2)	Externalisers	Overall Difference	-6.66 (-12.3 - -0.99)	0.0218		-4.54 (-8.76 - -0.31)	0.0354	
		Time Point 2	-6.53 (-12.6 - -0.42)	0.0364		-4.88 (-9.70 - -0.07)	0.0469	
		Time Point 3	-6.79 (-13.2 - -0.40)	0.0375		-4.19 (-9.32 - 0.95)	0.11	
Social Functioning (PKBS-2)	Combined	Overall Difference	-18.5 (-23.6 - -13.4)	<.0001		-3.72 (-8.17 - 0.74)	0.10	
		Time Point 2	-18.9 (-24.4 - -13.4)	<.0001		-4.95 (-10.1 - 0.17)	0.06	
		Time Point 3	-18.2 (-23.8 - -12.5)	<.0001		-2.48 (-7.78 - 2.81)	0.35	

Outcome	Psychological Profile	Time Point	Difference in Score (95% CI) (Unadjusted)	P-Value Overall/ Time Point (Unadjusted)	P-Value Interaction (Unadjusted)	Difference in Score (95% CI) (Adjusted)	P-Value Overall/ Time Point (Adjusted)	P-Value Interaction (Adjusted)

Note. Reference for estimate is normal profile (score > 0 means a greater increase in change from baseline score in the displayed profile, a negative score means a greater decrease in change from baseline in the specified profile than normal profile). Adjusted results include carer education level, household income, household status, child gender, and parent mental health history.

Table 5.12

Overall Difference in Main Study Outcomes and at Each Time Point, With P-Values for Interaction Between Time, Psychological Profile, and Early Child Care Arrangement.

Unadjusted /Adjusted	Outcome	Psychological Profile	Time Point	Informal Care	Formal Care	P-Value - Difference in Difference
Unadjusted	Emotional Functioning (Internalising Scale - CBCL)	Internalisers	Time Point 2	5.56 (-2.77 - 13.90)	-3.00 (-8.79 - 2.79)	0.08
			Time Point 3	-4.51 (-13.4 - 4.40)	-1.34 (-7.60 - 4.93)	0.54
		Externalisers	Time Point 2	0.20 (-7.86 - 8.26)	1.83 (-4.29 - 7.95)	0.75
			Time Point 3	2.84 (-5.80 - 11.47)	-1.09 (-8.09 - 5.91)	0.48
		Combined	Time Point 2	8.57 (-0.48 - 17.63)	2.81 (-3.42 - 9.04)	0.23
			Time Point 3	1.08 (-7.98 - 10.14)	3.48 (-3.11 - 10.07)	0.63
	Behavioural Functioning (Externalising Scale - CBCL)	Internalisers	Time Point 2	2.02 (-5.31 - 9.34)	-6.06 (-10.5 - -1.63)	0.06
			Time Point 3	-8.77 (-16.5 - -1.01)	-1.36 (-5.70 - 2.99)	0.10
		Externalisers	Time Point 2	-5.06 (-12.7 - 2.56)	6.63 (0.85 - 12.41)	0.0125
			Time Point 3	-4.06 (-12.1 - 3.93)	2.46 (-3.60 - 8.53)	0.18
		Combined	Time Point 2	7.69 (-0.39 - 15.77)	5.70 (0.54 - 10.86)	0.65
			Time Point 3	1.78 (-6.20 - 9.77)	2.74 (-2.72 - 8.19)	0.83
	Social Functioning (PKBS-2)	Internalisers	Time Point 2	-3.24 (-11.1 - 4.61)	3.03 (-1.68 - 7.73)	0.17
			Time Point 3	9.89 (0.83 - 18.94)	-1.98 (-6.58 - 2.63)	0.0210
		Externalisers	Time Point 2	-4.32 (-12.1 - 3.42)	-4.62 (-10.4 - 1.12)	0.95
			Time Point 3	-3.92 (-12.1 - 4.26)	-3.02 (-9.11 - 3.06)	0.86
		Combined	Time Point 2	-9.13 (-17.6 - -0.67)	-3.40 (-8.59 - 1.80)	0.22

Unadjusted /Adjusted	Outcome	Psychological Profile	Time Point	Informal Care	Formal Care	P-Value - Difference in Difference
			Time Point 3	-9.94 (-18.4 - -1.54)	-1.32 (-6.78 - 4.15)	0.07
Adjusted	Emotional Functioning (Internalising Scale - CBCL)	Internalisers	Time Point 2	6.46 (-2.17 - 15.09)	-4.26 (-10.3 - 1.78)	0.0346
			Time Point 3	-3.60 (-12.8 - 5.62)	-2.64 (-9.13 - 3.84)	0.86
		Externalisers	Time Point 2	2.07 (-7.22 - 11.36)	1.83 (-4.50 - 8.17)	0.97
			Time Point 3	5.08 (-4.82 - 14.98)	-1.09 (-8.27 - 6.08)	0.32
		Combined	Time Point 2	4.32 (-5.66 - 14.29)	1.53 (-5.19 - 8.25)	0.59
			Time Point 3	-3.18 (-13.2 - 6.80)	2.45 (-4.56 - 9.47)	0.29
	Behavioural Functioning (Externalising Scale - CBCL)	Internalisers	Time Point 2	2.41 (-4.77 - 9.59)	-6.10 (-10.5 - -1.71)	0.0471
			Time Point 3	-8.59 (-16.3 - -0.89)	-1.15 (-5.51 - 3.22)	0.10
		Externalisers	Time Point 2	-1.58 (-9.57 - 6.42)	6.76 (1.17 - 12.34)	0.08
			Time Point 3	0.23 (-8.20 - 8.65)	3.07 (-2.83 - 8.98)	0.57
		Combined	Time Point 2	6.74 (-1.69 - 15.17)	4.41 (-0.82 - 9.64)	0.60
			Time Point 3	1.01 (-7.32 - 9.35)	1.49 (-3.99 - 6.97)	0.92
	Social Functioning (PKBS-2)	Internalisers	Time Point 2	-4.67 (-12.7 - 3.31)	2.06 (-2.77 - 6.88)	0.15
			Time Point 3	8.40 (-0.88 - 17.68)	-3.49 (-8.27 - 1.30)	0.0243
		Externalisers	Time Point 2	-7.21 (-15.9 - 1.48)	-5.47 (-11.2 - 0.31)	0.74
			Time Point 3	-6.80 (-16.0 - 2.35)	-4.32 (-10.4 - 1.80)	0.65
		Combined	Time Point 2	-9.11 (-18.0 - -0.26)	-3.17 (-8.54 - 2.20)	0.22
			Time Point 3	-9.82 (-18.6 - -1.03)	-1.46 (-7.06 - 4.15)	0.09

Unadjusted /Adjusted	Outcome	Psychological Profile	Time Point	Informal Care	Formal Care	P-Value - Difference in Difference

Note. Reference for estimate is normal profile (score > 0 means a higher score in specified profile vs. normal). Adjusted results include carer education level, household income, household status, child gender, and parent mental health history.

Table 5.13

Overall Difference in Main Study Outcomes and at Each Time-Point, With P-Values for Overall Difference and Interaction Between Time and Hours of Formal Care

Outcome	Hours In FCCA	Time Point	Difference In Score (95% CI) (Unadjusted)	P-Value Overall Or At Timepoint (Unadjusted)	P-Value Interaction (Unadjusted)	Difference (Adjusted)	P-Value Overall or At Timepoint (Adjusted)	P-Value Interaction (Adjusted)
Emotional Functioning (Internalising Scale - CBCL)	21-30 hrs	Time Point 2	3.79 (-1.73 - 9.30)	0.18	0.38	4.92 (-0.28 - 10.11)	0.06	0.49
	31+ hrs	Time Point 2	5.20 (-1.35 - 11.76)	0.12		6.10 (-0.11 - 12.30)	0.05	
	21-30 hrs	Time Point 3	0.45 (-5.54 - 6.44)	0.88		2.14 (-3.54 - 7.81)	0.45	
	31+ hrs	Time Point 3	1.55 (-5.76 - 8.86)	0.67		2.92 (-4.10 - 9.94)	0.41	
Behavioural Functioning (Externalising Scale - CBCL)	21-30 hrs	Time Point 2	2.53 (-2.42 - 7.48)	0.31	0.32	1.75 (-2.71 - 6.22)	0.44	0.61
	31+ hrs	Time Point 2	5.32 (-0.46 - 11.10)	0.07		3.79 (-1.44 - 9.02)	0.15	
	21-30 hrs	Time Point 3	0.37 (-4.82 - 5.55)	0.89		0.04 (-4.66 - 4.74)	0.99	
	31+ hrs	Time Point 3	1.17 (-4.81 - 7.15)	0.70		1.16 (-4.31 - 6.64)	0.67	
Social Functioning (PKBS-2)	21-30 hrs	Time Point 2	-2.93 (-8.23 - 2.36)	0.27	0.99	-2.54 (-7.75 - 2.66)	0.33	0.98
	31+ hrs	Time Point 2	-6.80 (-13.0 - -0.62)	0.0314		-8.29 (-14.4 - -2.22)	0.0081	
	21-30 hrs	Time Point 3	-2.61 (-8.13 - 2.92)	0.35		-2.71 (-8.13 - 2.71)	0.32	
	31+ hrs	Time Point 3	-6.48 (-12.9 - -0.11)	0.0462		-8.07 (-14.4 - -1.77)	0.0127	

Note. Reference for estimate is lowest category of formal care hours (<21 hr/week). A score > 0 means a higher score in specified category vs. <21 hrs/week.

Adjusted results include carer education level, household income, household status, child gender, parent mental health history, and child psychological profile