Paternal Involvement in Early Childhood and Subsequent Child Outcomes in British-born Children: Evidence From the Millennium Cohort Study

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Abstract

The level involvement that British parents profess in bonding with their children is unequally distributed between husbands and wives in two-parent families, with mothers tending to be more involved than fathers. Multivariate regressions done using cohort data from the UK Millennium Cohort Study finds that the extent of a father's involvement in bonding activities with his child at ages 5 and 7 is positively predicted by family income, paternal unemployment, and by his child being male. This variation of parental involvement is itself associated with other child outcomes. Controlling for maternal involvement, fathers who were more involved tended to have children with fewer socio-emotional difficulties at age 14, as well as an increased odds of aspiring to masculine (jobs with more men than women in them) and extrinsically-oriented (goals about financial success, power, or popularity) occupations at age 7.

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1 | Introduction

The involvement of British fathers in the care of their children has changed significantly over the second half of the twentieth century, both in the total time spent and as a proportion of all parental childcare (Fisher, McCulloch, & Gershuny, 1999). This has been associated with a number of factors ranging from changes in employment patterns to shifts in family structures. Earlier single-earner male-breadwinner households gave way to today's dual-earner/dual-carer family model, and the rise in the role of women in the workplace has changed how paid and unpaid work is distributed within the family unit (Kan, Sullivan, & Gershuny, 2011). This dual-earner/dual-carer family model as a positivist description and a normative aspiration postulates that husbands and wives engage symmetrically in both paid work in the labour market and in unpaid work at home. This model is both inaccurate and unusual because this change is unequally applied. Women have become earners to a greater extent than men have become carers and homemakers.

Even though fathers have on average been able to spend more time with their children, research in many countries confirms that when compared to mothers, fathers still continue to spend less time with their children (Smith, 2004). This is evidenced in a number of contexts including some East Asian countries (Kan & Hertog, 2017), the US (Bianchi, 2000; Sandberg & Hofferth, 2001), the UK (Gershuny, Fischer, Gauthier, Jones, & Baert, 2000; Fisher et al., 1999), and in some European countries as well (Knijn & Selten, 2002; Hallberg & Klevmarken, 2001). Between 2002 and 2005, with the introduction of statutory paternity leave and pay in 2003, the proportion of UK fathers taking more than two weeks leave around childbirth increased from 22% to 36%, and the proportion of UK fathers with access to flexible working time increased from 22% to 54% (Smeaton & Marsh, 2006). UK parents are also allowed to share the country's statutory parental leave entitlement (now up to 50 weeks of leave and up to 37 weeks of pay according to

a UK government website)[1]. The consensus in the literature is that paternal time – the time spent by fathers on childcare activities (as well as household chores and other forms of domestic labour) – is on the rise. However, overall levels of the proportion of time spent by fathers on childcare still remains low. While the associates of this increase has yet to be conclusively understood, all parents (but especially fathers) with a higher level of education tend to spend more time with their children as compared to those with lower educational qualifications (Fisher et al., 1999; Dex & Scheibl, 2001). This is not without its effects on the children of these parents, ranging from health and psychological development to aspirations and labour market outcomes (Lundborg, Nilsson, & Rooth, 2014).

Support for new parents in the UK and elsewhere still tends to focus on mothers, and this support is more actively used by women compared to men (Kroll, Carson, Redshaw, & Quigley, 2016). Parental involvement is positively associated with the development of child emotional regulation, social skills, and other aspects of child behaviour (Flouri, 2010; Lamb & Lewis, 2010). Many areas of psychological functioning seem to be associated with parental characteristics such as maternal or paternal psychopathology, absence, partner relationship, and ethnicity (Birmaher et al., 1996; Kroll et al., 2016; Ramchandani et al., 2005). These highlight the importance of parental influence of child development generally.

However, evidence for the direct benefit of paternal involvement is limited (Sarkadi, Kristiansson, Oberklaid, & Bremberg, 2008) and definitions of paternal involvement have also been inconsistent with studies tending to focus on co-residency and frequency of contact alone without consider the type of activities done together (Kroll et al., 2016). A 2014 review has even suggested that fathering and mothering are not qualitatively different; that there are no discernible differences between the influence of the mother and father, and that the same measures ought to be used when surveying mothers and

[1]See https://www.gov.uk/shared-parental-leave-and-pay

fathers on their involvement with children (Fagan, Day, Lamb, & Cabrera, 2014). These issues are complex and span multiple disciplines including public health and epidemiology, sociology, demography, and economics. This thesis seeks to analyse two issues linked to variation in parental time spent taking care of the child in their early childhood: child socio-emotional development and child vocational aspiration. These early-childhood indicators are pertinent as they are themselves further linked to disparities in a range of later life outcomes including educational and employment prospects.

1.1 Aims and Objectives

This thesis has two aims. Using UK cohort data, it first aims to analyse trends in paternal and maternal involvement in early childhood. Distinct from the infancy stage of development, this thesis defines the period of early childhood as being from ages 5 to 7. While there has been documentation on past trends of parenting behaviour, this thesis will use a longitudinal dataset whose subjects are British children born in the year 2000/2001: the UK Millennium Cohort Study (MCS). While parental influence can impact their child at any age, it is around this age at which parents seem to be able to most significantly be able to influence their child's socio-emotional, psychological, and other behavioural outcomes (Flouri, 2010; Kroll et al., 2016). This thesis will be drawing from, within the MCS, questions asked to parents on the type and frequency of child bonding activities they do with their children. While primarily focusing on the activities of the father, this thesis necessarily factors in the role of the mother to come up with a typology of parental involvement in early childhood. Studying paternal involvement without considering maternal involvement as a control makes little real-world sense for two-parent households.

The second aim of this thesis is to explore the association between parental involvement and two outcome variables: child occupational aspiration at age 7 and child socio-emotional difficulties at age 14. It will use the same

longitudinal survey data for these purposes, drawing from questions asked to both the child and their parents. Apart from the coding the socio-economic class of the occupation that the children reported aspiring to, information is also available on how 'masculine' and 'feminine' the vocations are (going by the proportion of men and women who work in these fields) as well as how extrinsically or intrinsically-oriented these goals are. Information is also available on child socio-emotional development or behaviour using the Strengths and Difficulties Questionnaire (SDQ) done as part of the MCS, which is a measure of child psychopathology in the context of emotional and behavioural difficulties.

This three-part thesis will therefore be guided by the research questions:

- How do British fathers and mothers distribute their parental involvement in bonding activities with their child?
- What is the association between the distribution of parental involvement and child socio-emotional development?
- What is the association between the distribution of parental involvement and child vocational aspiration?

1.2 Structure of Thesis

After the introduction in Chapter 1, this thesis will continue with a literature review in Chapter 2 to examine the theoretical framework of these topics as well as any empirical evidence currently available. It will cover the variation of mothers and fathers' involvement in bonding activities with their child, the effects on child socio-emotional development, and on child aspiration. Chapter 3 will then describe the data and method, including data collection and the features of the original sample found in the Millennium Cohort Study.

The analysis will begin in Chapter 4 by first creating a typology based on whether the parents are highly or hardly involved in bonding activities during

their child's early childhood years (ages 5 and 7). Two variables will be formed, the first is a continuous score for each parent representing degree of involvement individually, and the second is a categorical variable considering both parents' involvement together where one or both parents may be highly or hardly involved in bonding activities with their children.

Chapters 5 and 6 will build and run statistical models to ascertain the association between parental involvement and the metrics of socio-emotional difficulties and occupational aspiration of their children. It will describe how the predictor, outcome, and control variables are derived and constructed from the original data before presenting the findings. Sensitivity analyses in the form of specification curves (Simonsohn, Simmons, & Nelson, 2015) will then be performed for each of the regression models run, examining the effect of varying the combinations of control variables used on the coefficient or odds ratios of paternal involvement on the outcome variable of interest. Chapter 7 will discuss the results before concluding and stating any limitations of the thesis in Chapter 8.

2 | Literature Review

This literature review has three sections. The first section will discuss the theoretical frameworks explaining how mothers and fathers distribute their involvement in child bonding activities, which this thesis hence terms as parental involvement. While this thesis does not investigate the distribution of domestic labour – it only focuses on time spent with children rather than on routine and non-routine household chores – the theoretical explanation for how this is distributed between mothers and fathers has some overlap and both will be examined. While housework mostly tends to be borne by mothers, involvement in children tends to be seen as a 'common good' (Becker & Lewis, 1973) and thus the level of involvement in bonding with children is thus viewed in the literature as being distributed in a more equitable way than housework is. It will draw on psychological, socio-cultural, and economic reasons behind the distribution of parental involvement in the domestic sphere. The second part will then focus on the effects of this distribution on child psychopathology in the context of emotional and behavioural difficulties, where the theoretical framework for the positive relationship between parental involvement and child psychological outcomes will be examined. The third will examine the effect of parental involvement on occupational aspiration formation.

Paternal time, commonly defined as the time fathers spend looking after their children, is taken as a measure of active fathering (Smith, 2004). The term 'involvement', then, is the extent to which this activity comes in the form of engagement, accessibility, and responsibility. The amount of time fathers have been spending with their children has increased significantly over the last few decades. The figure rose from 15 minutes a day in the 1970s to 2 hours by the late 1990s in a week (Featherstone, 2004). Yet, just as the economic and labour market changes have not been felt equally during this period, parental time has not increased equally either. Indeed, fatherhood today has sometimes been cast as something of a crisis due to the prevalence

of absent or non-resident fathers and its effects (Hobson, 2002). But for most families with both parents present, the deeper issue is about enabling men to become active and engaged fathers to their children. The focus of this thesis will be on men who have children within a two-parent heterosexual family. Even though it may not be representative of all men (or all fathers), it is especially within this household context that changes in employment patterns can redefine what it means to be an active father (Featherstone, 2004; Lamb, 2004).

The Division of Parental Involvement From Fathers and Mothers

Most of the existing literature on how parental involvement is distributed between husbands and wives tends to focus on childcare activities and housework (cooking, cleaning, doing laundry etc.) rather than on bonding activities which is the focus of this thesis. Much of the logic surrounding the gendered division of domestic labour cannot be so easily applied to this context. For instance, two examples of theories on the domestic division of labour include the joint utility-maximising and the resource bargaining approach. These suggest that mothers and fathers divide domestic tasks unequally on an economic gradient based more or less on their relative efficiencies in the labour market doing paid work. One key assumption is that domestic labour is domestic labour is seen as an economic good to be divided between the two spouses, with economic concepts of price/income elasticity and substitution effects coming into play (Becker, 1965, 1985).

However, the dynamics behind the division of resources (including time spent on bonding activities or intensity of emotional involvement) spent on children operates in a different manner from other forms of domestic labour. While the division of housework and household chores tends to be based on economic factors such as the earning power of each spouse, the distribution of childcare and levels of involvement tends to be predicted by educational attainment and other socio-economic characteristics of the household (Smith, 2004). In his economic analysis of marital instability (Becker, Landes, &

Michael, 1977), Becker refers to children as a form of 'marital-specific capital' which is shared between both spouses within a marital union, which contrasts his and others' conceptualisation of housework/domestic labour as an economic commodity to be traded away for utility-maximising ends. Children and the parental involvement in them are conceptualised as a common good shared equitably by both parents, while housework and domestic labour is distributed unequally often along an economic and gendered gradient.

Becker discusses the quality-quantity trade-off in children raised within a marital union (Becker & Lewis, 1973; Lundholm & Ohlsson, 2002). Within his analysis he discusses the qualitative (maternity care or prenatal child costs) and quantitative (numbers of children) costs of raising children. He further describes how some of the qualitatively associated costs for children can be conceived as 'public goods' (a better but less ubiquitous expression would be 'family goods', Becker says), whereby the costs refer to things like time spent on bonding activities or other forms of emotional involvement. In this, and in Becker's other analyses on the economic determinants of marital instability, divorce, and potential remarriage (Becker et al., 1977), what is relevant for this thesis was his distinct ways of conceptualising costs of child involvement as compared to costs associated with chores and housework (Becker, 1965). Becker (1973, 1977) sees parents and child(ren) as two economic agents involved (in the short term) in a uni-directional transfer of resources from the former to the latter. In conceptualising both parents acting as one combined unit with respect to child involvement, Becker implicitly suggests that child involvement (unlike housework and chores) is shared in commonality between the father and mother. It is not the case, for Becker, that husbands and wives divide child involvement as they divide housework, but that they do bond with their child together.

More recently, studies have shown that in the context of work/life balance (Lister, 2003, 2010), child involvement varies positively with educational attainment, employment, household income, and other economic factors. Other

studies have explored different factors which may be associated with paternal involvement, including the level of involvement that mothers have with their children, the gender of their child and other socio-economic or psychological considerations like motivation, skills, confidence, social support, institutional policies and cultural norms (Lamb & Lewis, 2010). These perspective tend to predict parental involvement in child bonding activities rising in tandem such that, for example, wealthier families with better-educated parents will together spend more time with their children. Yet, studies on the related topic of the gendered division of domestic labour in relation to household chores predict that married women tend to do the lion's share of the work with respect to men, with husbands and wives seen as two economic agents in opposition to each other. A possible explanation for the difference between these two views is that housework seems to be defined as a disutility while parental involvement in bonding activities is seen as a utility (a 'pleasure') instead. However, some overlap exists as it is possible to conceptualise certain child bonding activities to have disutility. One example could be around activities such as parents taking their child to the playground or playing games with them, which parents may do with their child as a result of their child pestering them as opposed to out of altruistic pleasure. A parent may read their child a bedtime story not out of pleasure alone but because their child may not go to bed if this isn't done. Not all bonding activities may be done happily and willingly. It is therefore not impossible to group certain child involvement activities together with the concept of housework or domestic labour. This therefore potentially relegates child involvement on the same level as domestic labour, which many theories postulate being overwhelmingly done by mothers (Kan & Laurie, 2018; Blau, 1998; Ramos, 2003).

There are a number of theories as to why this gendered division of domestic labour exists: the economic joint utility-maximising argument, the resource bargaining approach, and social norms around 'doing gender'. The joint utility-maximising argument focuses on the combined returns on paid work per unit of time as formulated by Becker (Becker, 1965) and uses traditional

neoclassical micro-economic models to account for the gendered allocation of labour. The logic of it is akin to economic trade theory on comparative advantage, such that in order to maximise the total returns from paid and unpaid work (conceptualised as two types of tradable commodities), the agent with greater relative efficiency of paid work (typically the husband) should specialise in it while the agent consequently with more relative efficiency in unpaid work (typically the wife) should specialise in that instead. The total returns from the trade would be greater than if each trading agent, i.e. the married husband and wife, both did a portion of paid and unpaid work on their own. The resource bargaining approach is similar in the sense that it is underpinned by instrumentally rational husbands and wives, but instead of maximising their joint utility, the focus is on their individual utilities instead (Lundberg & Pollak, 1996). This theory focuses especially on relative income level to determine the bargaining power that the husband and wife hold within their marital union/cohabitation arrangement. As the average man earns more than the average woman, the logic is that men thus tend to contribute less to housework because they would already be contributing more to household income and thus have more power (Lyonette & Crompton, 2015).

The final set of arguments predicting the behaviour of married men and women on child involvement comes from the psychological and socio-cultural. First, it is possible to argue that women tend towards family roles, such as involvement in child bonding activities, because they have a psychological propensity for childcaring and kinkeeping roles (Rosenthal, 1985). For example, in a meta-analytical review titled 'Men and things, women and people', Su and others find evidence for the greater preference for men with investigative interests related to engineering, science, and mathematics (i.e. 'things'), and women with artistic and social ones (i.e. 'people') (Su, Rounds, & Armstrong, 2009). This feeds into other theories on gendered norms which exist in the UK context within which this thesis is framed (Brines, 1994). Brines found traditional theories on the distribution of parenting based on

relative earning power lacking. Her model of dependency and providership within a husband and wife union was unable to account for the asymmetrical behaviours that men and women exhibit when either person experiences an income disparity relative to the other. In cases where husbands did less paid work than women, they still continued to do less housework, showing that men and women respond differently to issues of dependency or providership and that they were unable to simply substitute their paid and unpaid roles. Brines found that while wives respond consistently to the dependency model (wives do more housework when they earn less relative income) the husbands did not. Men who were dependent on their wives as a consequence of joblessness were prone to disavow housework. To account for this, she and others (West & Zimmerman, 1987) invoke the 'display perspective' which draws from Goffmanian performativity (Goffman et al., 1978) as a means to account for gendered patterns of behaviour. Also called 'doing gender', this perspective suggests that couples are acting out social roles in accordance to one's gender. This perspective pits masculinity and femininity as a hegemonic social force which affects action at an individual level. While men would need to 'display' masculinity through success in paid work and an active avoidance in domestic tasks like childcare and housework (since masculinity is often self-defined in opposition to femininity), women do not express their gender identity in the same way and thus 'display' femininity through a proclivity for domestic labour and childcare or child involvement activities (Brines, 1994). Applied to the realm of bonding activities with children, differences between fathers and mothers in the level of involvement they have with their children are thus expected with respect to different sets of predictor variables.

Three statements can be made to summarise the above. First, there are competing perspectives as to whether child involvement is a 'public/family good' done in commonality or a disutility whose costs are distributed unevenly. Second, if done together, it tends to be positively associated to socioeconomic variables; if distributed unevenly, theories predict mothers doing

the lion's share of the bonding activities with their children. Lastly, evidence suggests that parental involvement is positively predicted by educational and economic outcomes, or by gendered psychological traits or social norms (and is thus strongly predicted by the sex of the parent).

Parental Influence on Child Socio-emotional Development

Parental time also heavily influences how psychologically well-developed and socially well-adjusted a child is as they grow up (Noonan, Burns, & Violato, 2018). One all-encompassing metric designed to measure this concept of 'well-adjustedness' is termed in the literature as socio-emotional difficulties or development. In the Millennium Cohort Study (MCS), socio-emotional difficulties are derived from the Strengths and Difficulties Questionnaire (SDQ) (Goodman, 2001, 1997).

Child socio-emotional behaviour is an overarching term describing child psychopathology in the context of emotional and behavioural difficulties. It integrates a number of aspects of social and emotional change, including how emotions are expressed in certain contexts, what factors elicit emotional expressions, how social constructions form from emotional experiences, and the effects of emotion on social behaviour (Cui et al., 2018). It also encompasses externalising behaviours (such as conduct and hyperactivity problems) and internalising behaviours (including emotional and peer relationship-related problems). It is also important to describe what this measure does not represent. Socio-emotional difficulties are not the same as (but is likely associated with) clinically diagnosed mental health issues such as depression or anxiety often caused by biological rather than psychological shortcomings. It is also not the same as a child's personality traits, intelligence, or other intrinsic psychological traits which are relatively permanent aspects of a person (DeYoung, Quilty, & Peterson, 2007). Difficulties can be corrected for but personality traits are hard to change in a person. Instead, socio-emotional difficulties is a measure of psychopathology with an emphasis on *emotions* and how they are perceived to be self-regulated in a social setting. Before

a child reaches school-going age, parental attachment and time spent taking care of them would be what most influences their psychological and social development (Groh, Fearon, van IJzendoorn, Bakermans-Kranenburg, & Roisman, 2017), not only because early childhood when children are particularly susceptible to environmental impacts on their psychology (Bornstein, 1989), but also because they have not yet been exposed to the socialising forces of educational institutions like schools.

Inequalities in child behavioural difficulties are pertinent as they are linked to disparities in a range of later outcomes including later educational attainment and labour market prospects in adulthood (Lundborg et al., 2014). In the UK, stark inequalities in child physical and mental health have also been linked to poverty and social disadvantage. Child behavioural difficulties not only reflect impaired mental health, but they are also linked to adult outcomes, including academic attainment and employment. Problems in child socio-emotional behaviour have even been associated with poorer health and behavioural outcomes like obesity, substance abuse, juvenile delinquency, and criminality (Fergusson, John Horwood, & Ridder, 2005; Noonan et al., 2018).

The theoretical framework and direction of association surrounding the relationship between parental time and child socio-emotional development is relatively simple. Even if the specific causal mechanism is not always clear, the greater the attachment of the parent to the child, the better and more well-adjusted the child would be expected to end up being. A significant explanatory framework that is used to explain the link between parent-child interaction and its psychological and emotional impacts is attachment theory (Bowlby, 1982; Ainsworth, 1982). It postulates that parents' care-giving behaviour, rather than the child's endogenous characteristics, is the more important factor in predicting the variation in what Groh and others term 'attachment security' (Groh et al., 2017), referring to the strength of the parent-child bond and its associated benefits across a variety of child outcomes including lower socio-emotional difficulties. Experiences of parental

sensitivity or insensitivity are encoded by children into an internal working model encompassing views of the self, others, and the nature of relationships that influences developmental adaptation.

However, as early evidence for the predictive significance of attachment security began to emerge in the 1980s, questions arose concerning precisely what individual differences in infant attachment reflected (Groh et al., 2017). Whereas some scholars maintained that individual differences in infant temperament were of little importance in determining attachment levels and child behavioural outcomes (Sroufe, 1988), others contended that infant attachment security was the product of temperamental characteristics (Kagan, 1982). This decades-long debate led to numerous investigations that have produced mixed findings on the link between attachment and temperament, and therefore child socio-emotional behaviour.

More recently, there have been studies on the different predictors of child socio-emotional difficulties outside of parental influence and attachment. The relative importance of competing predictors are however still uncertain, with different studies demonstrating with different degrees of success how important different considerations are. These include parental discipline practices (Rajyaguru, Moran, Cordero, & Pearson, 2019), ethnicity (Zilanawala, Sacker, Nazroo, & Kelly, 2015), family income (Noonan et al., 2018), or employment (McMunn, Kelly, Cable, & Bartley, 2012). While none of these four make any causal claims, the study by Noonan et al. is particularly strong given their most comprehensive design and range of control variables used (some of which has been adapted by this thesis given they also use the same publicly available MCS data), demonstrating the importance of economic factors like income in child socio-emotional behaviour, which overlaps with Gottfredson's theory of circumscription and compromise in that both highlight the importance of parental wealth in shaping child outcomes. The use of discipline measures has also been found to be significantly associated with greater child socio-emotional difficulty. Non-white ethnicities are also linked

to greater child difficulties, even after controlling for income and area deprivation, showing the negative impact that ethnic minority children face. The strongest predictor of child difficulties, however, remains economic factors like parental employment and household income.

In conclusion, socio-emotional behaviour is a wide-ranging concept describing a child's socio-psychological developmental state. It is distinct from clinically diagnosable mental health issues like depression or anxiety. It is also different from personality traits which are relatively unchangeable aspects of a person. Current evidence suggests that economic factors and a healthy family environment are positively associated to child socio-emotional development.

Parental Influence on Child Aspiration

Aspirations can be defined as one's 'personal goals' or 'possible future selves' (Moulton, Flouri, Joshi, & Sullivan, 2018). Aspirations are not the same as the more commonly investigated notion of 'expectations'. While expectations reflect what a person thinks they will achieve, aspirations are more about what a person wants to achieve (Flouri, Tsivrikos, Akhtar, & Midouhas, 2015). Evidence from psychology, education, and vocational behaviour research has shown that career development begins early in childhood, sometimes even before they hit a school-going age. In a number of surveys when children are asked open ended questions about their life goals and general aspirations, they (as do adolescents) tend to respond by stating the type of occupation they would like to have rather than general future life states they would want to have (Croll, Attwood, & Fuller, 2010). The aspirations stated by younger children, however, tended to be fantastical or unrealistically optimistic. For example Croll finds that aspirations tended to be higher than parental achievements or more than what labour market opportunities might allow (Croll, 2008). While unrealistically high aspirations may lead to some negative outcomes (Gorard, See, & Davies, 2012), the evidence seem to suggest that having high aspirations is associated with positive traits and psychological well-being metrics.

A number of studies point to both individual psychological and environmental contextual factors in determining the kinds of aspirations children have (Moulton et al., 2018). Moulton suggests that this is usually approximated by opportunities and socialisation processes that differ across socio-economic status (SES) levels. For young children, their main frame of reference is the home and therefore parental SES is likely an important influence. The high levels of economic, cultural, social, and human capital (to use a Bourdieusian theoretical framework) (Bourdieu, 1973) of the parents would feed into their children and one way this shows itself is in the aspirations that these children have. It is not clear, however, at what age SES is significant as young children may not fully grasp the classist nature of occupations until a school-going age.

In general, child aspirations develop from vague representations of possible future outcomes to more realistic career preferences (Moulton et al., 2018). Gottfredson's theory of circumscription and compromise (Gottfredson, 1981) postulates that there are age-specific features of the aspirations of children as they progress into adulthood. According to Gottfredson's theory of circumscription and compromise, aspirations evolve with age from the fantastical to the concrete. Children go through a fantasy stage where their aspirations are based solely on their interests and desires, with little attention paid to their abilities and the difficulty of achieving their goals. As children grow into adults, they revise their aspirations based on their perception of their own abilities and interests, as well as societal and parental expectations of them. This theory suggests aspirations tend to develop in four stages:

- The first stage, from age 3 to 5 years, children's aspirations orientate towards size and power.
- The second stage, from age 6 to 8 years, sees children orient to sex roles. Children become aware of sex differences and tend to begin eliminating occupations from further consideration if they are not typical for their own sex.

- The third stage, from age 9 to 23 years, has them orient their aspirations to social valuation, mediating it towards not just gendered but also wider social and cultural norms as well.
- The fourth stage (which happens simultaneously with stage three), happening at about age 14, orients aspirations towards their sense of what Gottfredson terms the 'internal, unique self' (Gottfredson, 1981).

A number of studies has provided empirical evidence for Gottfredson's circumscription and compromise theory of aspiration, with general support found for the sex-based selection of aspiration by primary school children an d for the elimination of occupational possibilities in secondary school based on social valuation and that of one's own abilities and skills (Helwig, 2001, 2008; Schoon, 2001). There has however been less support for the cutoff ages than what Gottfredson originally proposed; the elimination of occupational possibilities in children due to socialisation may begin to occur at younger ages than Gottfredson originally purported (Flouri et al., 2015), justifying the choice of not just studying sexed differences but also parental influences on children's aspirations at age 7 even though the theorised cutoff age is at 8 to 9 years.

There are a number of important determinants of aspiration apart from socioeconomic background including sex, ethnicity, and temperament or personality (Moulton et al., 2018). This study focuses on parental influence as it is also one of the most important factors in predicting child aspiration (Jodl, Michael, Malanchuk, Eccles, & Sameroff, 2001). Children tend to aspire to the careers of their parents at a significantly higher rates than by chance, especially at primary school ages (Flouri et al., 2015; Hartung, Porfeli, & Vondracek, 2005), demonstrating how powerful an impact parents make on their children. Broadly speaking, there are two aspects of child vocational aspiration that parents can effect: interests and competence (Tracey, 2002). Bryant and others categorise the myriad of different ways parents influence their children's aspirations into three groups:

- As a source of occupational knowledge including beliefs, values, and attitudes about different vocations.
- Parental time spent on children boosts their 'exploratory processes' (Bryant, Zvonkovic, & Reynolds, 2006) which means they are likelier to consider more aspirational possibilities.
- And as a provider of material resources in, educational information, employment experiences, and work attainment knowledge leading to greater child self-efficacy (Bandura, 1982).

Parenting is more than just the sum of developmental processes like knowledge proliferation, economic transfers of resources, or life planning. Bryant and others discuss the importance of contextualising family life as an everyday lived occurrence which they term 'family culture' (Bryant et al., 2006) or 'doing family'. They argue that everyday occurrences are vital in influencing children as opposed to focusing on the effect of formal unidirectional instruction or teaching. We can therefore expect a child whose parents were more involved in spending time with them to have not only 'higher' aspirations (viewed in the context of the socio-economic classification of a particular job), but to also have been appropriately socialised and therefore display aspirations which are gendered according to their own sex. Empirically, this might be made difficult due to the increasing types of professions which are increasingly gender-neutral compared to in previous decades.

Lastly, apart from parental influence, other predictors are also important in considering aspiration choices. These will be expanded on in the analysis chapters. For one, sex differences are pronounced. Girls have been shown to have 'higher' and more intrinsic aspirations than boys as well as greater motivation for school (Schoon, 2001). Boys tend to have more adventurous aspirations, are more confident in their abilities, and are more likely to aspire to uncommon vocations (Helwig, 2008). Gender is therefore not only itself an outcome to be analysed, but a variable to be controlled for when ascertaining aspirational 'height'. A second important factor is cognitive or educational

performance of the parents since children tend to tag their aspirations to at least the level of their parents. The three aspects which this thesis will look at in the analytical chapters are that of the socio-economic class, masculinity or femininity, and extrinsic or intrinsic goals of occupational aspirations children profess at age 7.

3 | Data and Method

This chapter details the predictor, outcome, and control variables used in the thesis. It also explains the different ways in which some of the variables were either made available or differently constructed in the original publicly available Millennium Cohort Study (MCS) data. For example, the variable for ethnicity has three different typologies in the original raw data, consisting of a 6, 8, and 11-category typology. The age of the mother was also available as either a categorical variable of banded age groups, or as a continuous variable of age in years. Different studies drawing on MCS data have sometimes used these variables in their different forms. While these different forms of the same variable are all valid, it implies that cross-study comparisons may not always be completely fair if the same control variables were used in different forms. This analysis will swap out one form of a variable for another and look at its effects on the key coefficient or odds ratio of interest. The following sections will first outline features of the MCS before making explicit how each variable was used and constructed to avoid ambiguity. Table 3.1 will give the final breakdown of sample counts. All of the data wrangling and regression analysis for this paper was done with open-sourced programming language R (version 3.6.2).

3.1 Data and Variables

Millennium Cohort Study

The MCS[1] is a study based at the Centre for Longitudinal Studies at University College London. It is a longitudinal study of 18,818 children born in the UK between September 2000 and January 2002 (most of them will be born in calendar year 2001). It is a multidisciplinary survey developed to capture the effects of childhood development and other outcomes (Hansen, 2014). While there have been 7 surveys done to date (conducted at 9 months

[1]See https://cls.ucl.ac.uk/cls-studies/millennium-cohort-study

of age, followed by at ages 3, 5, 7, 11, 14, and 17), only data from the first 6 waves have been made available at the time of the analysis. The MCS oversampled from areas with higher levels of poverty and higher proportions of ethnic minority groups (Hansen, 2014). At each wave, caregivers were surveyed via interview and self-completed questionnaire. Later survey waves also included teacher interviews and physical, cognitive, and behavioural assessments of child development.

This paper was a secondary analysis of the MCS, using de-identified data available in the public domain. As this project falls within the remit of the original parent ethics approval (Hansen, 2014), no additional ethics clearance was required to access and download and use the anonymised dataset. Data was retrieved through the UK Data Service.

This thesis began processing of data by only using cases of single births such that twins, triplets, and higher order births within the birth cohort were omitted. It also omitted cases where either parent was absent as well as cases where both parents reported having the same sex.

Predictor Variable

Paternal and maternal involvement was drawn from MCS waves 3 and 4 (child age 5 and 7). It drew on seven questions asked to both mothers and fathers:

- How often do you read to your child?
- How often do you tell stories to your child?
- How often do you do musical activities with your child?
- How often do you draw or paint with your child?
- How often do you play physically active games with your child?
- How often do you play games or toys indoors with your child?
- How often do you take your child to the playground or park?

There were 6 valid responses: every day, several times a week, once or twice a week, once or twice a month, less often than that, and not at all. These were coded 1 to 6 respectively and non-responses were omitted. Scores were summed separately for the mother and father in each wave, where larger values indicated less parental involvement. Smaller values indicated more parental involvement.

Outcome Variable

Socio-emotional difficulties is a parent-reported measure, usually given by the mother in her role as the child's primary caregiver. During the MCS interview, parents answered questions about their child's socio-emotional behaviour using the Strengths and Difficulties Questionnaire (SDQ), age 4-15 version. The SDQ is a concise and well-validated tool used to measure prosocial behaviour and psychopathology of 3 to 16 year olds (slightly different versions of the same core questionnaire are given to children at different ages to reflect the changing considerations at different stages of childhood) (Goodman, 2001). Strengths of the SDQ include its psychometric properties and its continued wide usage in research on child behavioural outcomes (Noonan et al., 2018; Zilanawala et al., 2015; McMunn et al., 2012; Rajyaguru et al., 2019).

The SDQ is a short parent-reported screening questionnaire for psychopathology in the context of emotional and behavioural difficulties (Goodman, 2001). It comprises 25 items with five items each covering emotional, conduct, hyperactivity, peer, and prosocial behaviour. A sample copy of the questions asked are available in Appendix A. For all sub-scales except prosocial behaviour, a higher score indicates more problems. Higher prosocial difficulty scores indicated less problems. Items from the first four categories were summed to create the Total Difficulties Score (TDS) which is an amalgamated score reflecting general socio-emotional behaviour problems. Emotional and peer-related difficulties are considered 'internalising' problems, while conduct and hyperactivity/inattention behaviours are 'externalising'

problems (Goodman, 2001). Prosocial behaviour is a category unto itself which measures good social behaviour such as a child's ability to help others, share, or empathise with others. The primary outcome variable of interest is the parent-reported TDS score captured at MCS wave 6 when the child is at age 14. TDS scores at earlier waves will also be included in the model, detailed in Chapter 5.

Vocational or occupational aspiration was ascertained by means of a self-reported questionnaire given to children at MCS wave 4 at age 7. The children listed as many aspirations as they wanted, most of which were occupational or vocational, and the responses were coded in three ways: according to the occupation's socio-economic classification, its degree of masculinity or femininity, as well as looking at how extrinsic or intrinsic the goals are. These three sub-scales will be analysed separately. While respondents were able to list as many aspirations as they wished, the majority of them only listed one aspiration. The order in which the children reported their aspirations were recorded in the MCS data, and this thesis only used the first reported aspiration for consistency across the sample.

Socio-economic classification was coded according to the UK's Standard Occupational Classification (SOC) 2000[2] which includes 9 occupational types: managers and senior officials, professional occupations, associate professional and technical, administrative and secretarial, skilled trades occupations, personal service occupations, sales and customer service occupations, process plant and machine operatives, and elementary occupations. These are coded 1 to 9 respectively in the MCS dataset.

Masculine/feminine aspirations were coded by using the proportion of UK working-age women in that occupation according to 2nd quarter (April to June) 2008 Labour Force Survey (LFS), around the time of that the MCS wave 4 fieldwork was undertaken. The following bandings were applied: 'masculine' (<25% women), 'integrated' (25 to 49.9% women), 'feminine' (50 to

[2]See https://www.ons.gov.uk/methodology/classificationsandstandards

74.9% women) and 'ultra-feminine' (≥75% women) coded 1 to 4 respectively. These asymmetrical categories are as proposed by Hakim to reflect the situation where women are in the minority (Hakim et al., 1998). Non-occupational states were also allocated an appropriate gender category where possible (for example, the aspiration 'Superman' was coded as a masculine one, according to documentation from the original surveyors).

Extrinsic/intrinsic aspirations were coded according to self-determination theory (Deci & Ryan, 1985). Intrinsic aspirations were those involving life goals to do with affiliation, community, and personal development, while extrinsic aspirations involve goals like wealth, fame, and attractiveness. Aspirations were coded into four categories: 'extrinsic', 'extrinsic-intermediate', 'intrinsic-intermediate', and 'neutral' coded 1 to 4 respectively. Extrinsic aspirations reflect materialistic goals or concerns about image, power or popularity (for example, 'billionaire', 'famous', or 'supermodel'), while extrinsic-intermediate were goals that could reflect interests in financial success, image, praise or popularity (for example, 'actor', 'singer', or 'beautician'). Hardly any children gave purely intrinsic aspirations and thus this category was combined with the intrinsic-intermediate category. Intrinsic-intermediate goals revolve around helping other people and animals (such as 'nurse', 'doctor', 'teacher', or 'vet'). Aspirations that could not be coded were labelled 'neutral'.

Economic Control Variables

Economic variables are important to control for because they are powerful predictors of child psychological and health outcomes (Noonan et al., 2018), much of the difference in child outcomes over the life course can be explained by differences in their family's economic endowment.

Family income was calculated by averaging equivalised household income over the first 6 surveys, expressed in its logarithmic form. Several studies that have used MCS data included an averaged household income variable, but there are two possible and equally valid ways for this variable to be calculated

which produce slightly different findings if interchanged. From the income data collected at each wave, it is possible to either (1) first take logarithms of each wave's household income before calculating the arithmetic mean, or (2) take the arithmetic mean of each wave's household income before calculating the logarithm of the result. This thesis will use method (1) in its initial analysis but will consider both when performing sensitivity analysis.

Paternal and Maternal employment specifically at MCS waves 3, 4, and 6 were included due to the different outcome variables used. For example, it would be inappropriate to use employment at wave 6 when looking at child aspiration which is determined at MCS wave 4. There were two possible responses: whether the mother was in work (being on leave counted as being in work for this question) or whether she was not in work.

Demographic Control Variables

Demographic variables are important as child outcomes follow a demographic gradient, such as by displaying sexed, age-specific, or siblingship-based differences which ought to be accounted for when examining associations of child outcomes. Ethnicity is also important as another gradient by which differences in outcomes occur, and is additionally important as an approximation or proxy for different sets of cultural norms which are also important to account for.

Highest maternal educational qualification at MCS wave 6 was derived using the UK's National Vocational Qualification (NVQ) scale, with respondents giving their highest academic qualification before coding them into 7 categories representing NVQ levels 1 to 5, overseas qualifications, and none of these. The option for 'none of these' is not the same as a non-response.

Child age is given in years and is used as a continuous variable. While most children would be 14 years old, there are a significant minority who are aged 13, and a smaller group aged 15.

Child sex is a binary variable: female (coded 0) or male (coded 1).

There are three variables for **child ethnicity** representing a 6, 8, and 11-category typology for its classification. The 6 category variable has ethnic groups: White, Mixed, Indian, Pakistani and Bangladeshi, Black or Black British, Other Ethnic Group (including Chinese and others). The 8 category variable has the same variables, except separating Pakistani and Bangladeshi into two, and the Black or Black British variable into a Black Caribbean and Black African variable. The 11 category variable adds on to this by splitting the 'Other' variable into a Chinese, Other Asian, and Other Black categories. Again, it is possible to choose any of the three typologies. While this study will select the 8-category variable, all three will be used in sensitivity checks.

Number of siblings was recorded as a numerical value in the MCS, from 0 to 10. Since there were very few cases with 3 or more siblings, the categories will be collapsed into 4 categories representing no siblings, 1 sibling, 2 siblings, and 3 siblings or more. The original continuous variable ranging from 0 to 10 will be used in sensitivity analysis.

Mother's age at childbirth comes as two variables representing banded age groups and age in years. Age in years is a continuous variable ranging from 14 to 63. Conversely, there are four categories for banded age groups: 12 to 19 years, 20 to 29 years, 30 to 39 years, and 40 years and above. This analysis will use age as a continuous variable but will use banded age in the sensitivity analysis. **Father's age at childbirth** also comes as two variables grouped in the same way as maternal age.

Child Health Endowment Control Variables

This group of variables involves the health of the child both during pregnancy and at birth. They are important controls because some of the variation in child outcomes can be explained by differences in the mother's activities during pregnancy or in child infancy. Breastfeeding, for example, has been linked to significant improvements in child outcomes (Britton, Britton, & Gronwaldt, 2006). Child health during their mid to late childhood years can also be predicted by their health in infancy with things like birthweight and

gestational age.

Child birthweight is used in this analysis as a binary variable: more than 2.5 kg for babies of normal weight (coded 0), and less than or equal to 2.5 kg for babies who are underweight (coded 1) (Noonan et al., 2018).

Child gestational age is also used as a binary variable: full term babies are defined as being born more than or equal to 37 weeks into pregnancy (coded 0), while those not at full term were born less than 37 weeks in (coded 1).

Child longstanding illness was a binary parent-reported metric where the primary caregiver was asked to report if their child had any longstanding health problems. This variable does not detail what these health issues are, but merely captures a yes/no response (coded 1/0 respectively).

The extent to which the **mother was drinking during pregnancy** was captured in a 7-category variable. Responses include: never, less than once a month, 1-2 times a month, 1-2 times a week, 3-4 times a week, 5-6 times a week, and every day, coded 0 to 6 respectively. A higher score thus represents a higher degree of alcoholism. Noonan et al., however, had used MCS data but coded this variable into a 4-category variable: never, light, moderate, and heavy (Noonan et al., 2018) and this is reconstructed used for later sensitivity analysis and robustness checks.

Mother's extent of smoking during pregnancy was used as a 3-category variable: never smoked, stopped during pregnancy, and smoked throughout pregnancy.

Breastfeeding duration was grouped into 5 categories: no breastfeeding, breastfed for less than 7 days, for 1 week to 3 months, for 3 months to 6 months, and for above 6 months.

Household Environment Control Variables

This set of variables contain information about the child's home environment and lived experience, ranging from the personality of their parents, to their discipline strategies, behaviours, and other familial habits. It does not, however, include details of their wider neighbourhood such as relative degree of deprivation and only focuses on the child's lived environment in the home. These are important as controls because this analysis would like to examine the association of parental involvement in child bonding activities on its own, separated from other forms of parental interaction with their child such as discipline use or the presence of regularity in the child's home. Maternal personality, distress, or depression is also important to control for because it might also influence how parents interact with their children.

The five-factor personality model represents the five broad dimensions that seem to be common to human personality and psyche (DeYoung et al., 2007). Data on **maternal five-factor personality traits** was available in the MCS covering the traits: **openness, conscientiousness, extraversion, disagreeableness, and neuroticism**. Each personality trait was used as a separate variable with a continuous numerical score corresponding to how strongly respondents displayed the given personality traits.

Maternal psychological distress is important as this may be one source of bias in the child socio-emotional development score given that it is a parent-reported metric. This was measured using the Kessler-6 (K6) questionnaire (Kessler et al., 2002) as part of the MCS from waves 2 and beyond. For the first wave at child age 9 months, an 8-item scale based on the Rutter Malaise Inventory (RMI) was used instead (Schoon, Sacker, Hope, Collishaw, & Maughan, 2005). Both are validated measures, used widely as screening tools for psychological affect (Noonan et al., 2018). At each wave of the survey, a binary variable was constructed from the K-6 or RMI scores indicating whether or not the mother had suffered from psychological distress (yes/no results were coded 1/0 respectively). A score of $\geq$6 out of 24 for the K-6

questionnaire and a score of ≥4 out of 9 for the RMI were taken to indicate the presence of distress as in Noonan et al.'s study (Noonan et al., 2018). Long-term psychological distress was then operationalised by summing the binary scores to count at how many waves the mother had experienced distress. The final variable thus took values of 0 to 6 and is used as a categorical variable.

Whether the mother has been diagnosed with depression or anxiety is distinct both in its conceptual and technical construction from the above variable measuring extent of distress. Depression/anxiety is only assumed to have been present if the mother has been clinically diagnosed, and is a binary variable with yes/no responses being coded 1/0 respectively as opposed to one containing multiple categories.

Change in mother's relationship between waves 5 and 6 was used to take into account recent changes in the child's household parental dynamics. This question was asked to the mothers in the survey. There were three categories for this variable: no change, became partnered, and became single.

Whether the child has regular bedtime on weekdays was used as a proxy for the presence of regularity and routine in the household. There are four categories that were given in the original MCS data: never, sometimes, usually, and always.

Discipline was conceptualised and constructed as per Rajyaguru et al.'s study investigating the association between discipline strategies and child mental health (Rajyaguru et al., 2019). This analysis drew on MCS wave 3 (child at age 5) data and wave 4 (child at age 7) data. The data contained 8 items pertaining to disciplinary practice originating from the Conflict Tactics Scale (Straus, 2017) developed initially to explore inter-familial conflict and parent interaction with children.

Mothers were asked about items based on their child's behaviour over the past 6 months and included how often they ignore/smack/shout/send to

bedroom or naughty chair/take away treats/tell off/bribe with sweets/reason with their child when they are naughty. Each item had 6 possible responses: never, rarely, once a month, at least once a week, daily, and can't say. 'Can't say' responses were coded as 0 with the rest being given codes 1 to 5 with 'never' being 1 and 'daily' being 5. These numbers were added across the 8 questions with higher scores representing greater use of discipline. This was done separately for wave 3 and 4.

Mothers were asked if they had any **longstanding illness** with yes/no responses being coded 1/0 respectively.

The variable for a **mother's current smoking/tobacco use** includes other forms of tobacco or nicotine products apart from just cigarettes. Mothers were asked whether or not they smoked, and the yes/no responses were coded 1/0 respectively.

The variable reflecting the extent of a **mother's current alcohol consumption** had 5 possible responses: never, monthly or less, 2 to 4 times a month, 2 to 3 times a week, or 4 or more times a week. These were coded 0 to 4 respectively and is used as a categorical variable.

The descriptive statistics for the above-mentioned control variables are given in table 3.1. Variable counts may not always total to the same value due to missing values, and percentages may not total to 100 due to rounding.

Table 3.1: Sample Counts by Variable

Variable	Frequency	% Total
Paternal employment (wave 3)		
In work	10852	88.90
Not in work	1355	11.10
Paternal employment (wave 4)		
In work	9816	89.77
Not in work	1119	10.23
Maternal employment (wave 3)		
In work	8610	56.48
Not in work	6635	43.52
Maternal employment (wave 4)		
In work	8624	62.24
Not in work	5233	37.76
Mother's highest educational qualification		
Not classifiable	1175	10.06
NVQ level 1	718	6.15
NVQ level 2	2754	23.58
NVQ level 3	1556	13.32
NVQ level 4	3882	33.24
NVQ level 5	1233	10.56
Overseas qualification only	360	3.08
Child age		
13	2824	24.08
14	8744	74.57
15	158	1.35
Child sex		
Female	5842	49.82
Male	5884	50.18
Child ethnicity		
White	8975	79.57
Mixed	534	4.73
Indian	303	2.69
Pakistani	575	5.10
Bangladeshi	252	2.23
Black Caribbean	116	1.03
Black African	216	1.92
Other (including Chinese)	308	2.73

Variable	Frequency	% Total
Number of siblings		
0	1619	13.81
1	5142	43.85
2	2967	25.30
≥3	1998	17.04
Child birthweight		
>2.5kg	17140	92.71
≤2.5kg	1347	7.29
Child gestational age		
≥37 weeks	16935	92.53
<37 weeks	1367	7.47
Child has longstanding illness		
No	9665	83.38
Yes	1927	16.62
Mother drinking during pregnancy		
Never	13180	71.26
Under once a month	2461	13.31
1-2 times a month	1268	6.86
1-2 times a week	1270	6.87
3-4 times a week	201	1.09
5-6 times a week	48	0.26
Every day	68	0.37
Mother smoking during pregnancy		
Never smoked	11963	64.57
Stopped during pregnancy	2361	12.74
Smoked throughout pregnancy	4204	22.69
Breastfeeding duration		
No breastfeeding	6109	33.29
Less than 7 days	6307	34.37
1 week to 3 months	2668	14.54
3 months to 6 months	2162	11.78
Above 6 months	1105	6.02
Maternal psychological distress		
No waves	2428	31.86
1 wave	2403	31.54
2 waves	1146	15.04
3 waves	653	8.57
4 waves	422	5.54
5 waves	337	4.42
All 6 waves	231	3.03

Variable	Frequency	% Total
Maternal depression or anxiety		
No	7565	71.41
Yes	3029	28.59
Change in mother's relationship (waves 5 and 6)		
No change	10039	90.44
Became partnered	434	3.91
Became single	627	5.65
Child has regular bedtime		
Never	459	3.48
Sometimes	938	7.12
Usually	4355	33.04
Always	7430	56.36
Maternal longstanding illness		
No	8830	76.00
Yes	2789	24.00
Does mother smoke		
No	9233	79.46
Yes	2387	20.54
Mother's current alcohol consumption		
Never	2444	21.98
Monthly or less	2787	25.06
2 to 4 times a month	2456	22.08
2 to 3 times a week	2537	22.81
4 or more times a week	897	8.07

Variable (Continuous)	Mean	Std Dev.
Family income	5.79	0.50
Mother's age at childbirth	28.33	5.97
Father's age at childbirth	31.89	6.28
Maternal five-factor personality traits		
Openness	13.86	3.84
Conscientiousness	17.50	3.14
Extraversion	14.16	3.89
Disagreeableness	18.03	2.80
Neuroticism	11.75	4.19
Discipline Score (Wave 3)	22.02	4.59
Discipline Score (Wave 4)	21.04	4.54

3.2 Method

A Typology of Paternal Involvement

After the above variables have been identified, processed, and cleaned, they will be codified in Chapter 4 to investigate how parental involvement is distributed between husbands and wives in British households. This will then form the main predictor variables to be used in Chapters 5 and 6. Fathers and mothers' distributions for the responses to the 7 questions will be mapped out to understand how they take care and are involved with their children. This will be done for both MCS waves 3 and 4 and then the differences compared. This will take the form of tables and histograms for each of the questions where appropriate. While this analysis will be able to describe how fathers and mothers on average change their behaviours when their child goes from age 5 to 7, one limitation is that it does not attempt to say anything about whether this is an age effect or period effect as no comparison with other cohorts were made.

Since the same questions have been asked to both mothers and fathers as primary and secondary caregivers respectively (as defined in the MCS), it is possible to replicate the above steps for mothers at waves 3 and 4. The same tables and charts will be reproduced for mothers, before synthesising the fathers' and mothers' scores together to form a typology with four groups representing the different combinations of whether the father and mother has low or high levels of involvement. This resulting categorical variable will then be used in later chapters.

Association with Socio-emotional Difficulties

Chapter 5 will investigate the association between parental involvement and their child's socio-emotional development. A multivariate ordinary least squares (OLS) regression will be used with the variables listed above, in line with the following model:

$$Y = \beta_0 + \beta_1 X + \beta_2 Z_a + \beta_3 Z_b + ... + \epsilon$$

Y represents the different measures of socio-emotional difficulty, X represents the variable for parental involvement, and the Z_n variables are the range of covariates/control variables introduced above. The β_n terms are the coefficients and ϵ is the error term. The magnitude and significance of the coefficients derived will form the basis of the resulting analysis.

The study will run several models, both without and with different combinations of controls (specified in the appropriate chapter) to enable comparisons of the coefficients of the key predictor variable.

Association with Occupational Aspiration

Given that the outcome variables in for occupational aspiration which will be covered in Chapter 6 are themselves categorical and non-binary variables, any direct multivariate regression would not be possible. Two things will be done instead. First, a cross-tabulation will first be done with the two variables of parental involvement against vocational aspiration in terms of (1) socio-economic classification, (2) degree of masculinity and femininity, and (3) the extrinsic or intrinsic goal of the occupations. A chi-square statistic will then be calculated used to determine statistical significance before examining the proportions of cases in each cell of the table.

The results for the masculinity and femininity of the child's occupational aspiration will be refined by collapsing the four original categories into a binary variable representing the dichotomy of masculine or feminine occupations, defined by the percentage of men and women working in the reported industries. The extrinsic and intrinsic nature of the occupational goal is also given as a categorical variable with four categories, and will be collapsed also into a binary variable representing extrinsic or intrinsic goals of aspirations. A multivariate logistic regression will then be done, and the results compared to the original cross-tabulation, using the following model:

$$log(\frac{P(Y)}{1-P(Y)}) = \beta_0 + \beta_1 X + \beta_2 Z_a + \beta_3 Z_b + ... + \epsilon$$

$P(Y)$ represents the probability that a child's aspiration is of an intrinsic/extrinsic or masculine/feminine nature. X represents the categorical variable for parental involvement, the Z_n variables are covariates/control variables. The β_n terms are logits and ϵ is the error term. The logits will be converted into odds ratios and reported appropriately in the later analyses.

Sensitivity Analysis Using Specification Curves

At the ends of both Chapters 5 and 6 investigating the two sets of child outcomes, there will be a sensitivity analysis with a multiverse perspective using specification curves exploiting researcher degrees of freedoms. A researcher degree of freedom refers to the different reasonable but often atheoretical choices that researchers need to make when conducting research (Gelman & Loken, 2013). This method iterates a given statistical model through every reasonable combination of how multiple variables can be used or constructed differently, thereby producing different results even if the 'same' input variables are used. As described in the Data section, some variables have either have multiple alternative forms in the MCS data or can be constructed in different but equally viable ways. For example, while age is important to control for, whether age groups (categorical) or age in years (continuous) ought to be used is less clear-cut. Yet this can have the effect of changing the final reported coefficient size or odds ratio magnitude.

Using specification curves (Simonsohn et al., 2015), it would look to capture the effect of varying such researcher degrees of freedom by examining how the coefficient of the key explanatory variables change when such freedoms are exploited. Specifically, the two types of researcher degrees of freedom this paper aims to study are on (1) changing the method of constructing certain variables, and (2) the choice to include or exclude control variables on the coefficient of a given explanatory variable.

4 | Paternal Involvement in Early Childcare

Fathers and mothers were asked in MCS waves 3 and 4 (when the child was aged 5 and 7 years) the following 7 questions questions:

- How often do you read to your child?
- How often do you tell stories to your child?
- How often do you do musical activities with your child?
- How often do you draw or paint with your child?
- How often do you play physically active games with your child?
- How often do you play games or toys indoors with your child?
- How often do you take your child to the playground or park?

There were other questions which had responses from one parent only (such as asking mothers on breastfeeding behaviour), but this analysis did not include them because no meaningful comparisons between the spouses may be made. This section considered all cases in waves 3 and 4 where a mother and father were both present. Differences in total sample sizes between fathers and mothers were due to different rates of missingness. In wave 3, the sample size for fathers and mothers who gave responses to these questions were 10,206 and 11,815 respectively. In wave 4, these were 8,908 and 10,563 respectively. Percentages will thus be primarily used as raw counts are unsuitable for direct comparisons.

For the above questions, there were 6 valid responses: every day, several times a week, once or twice a week, once or twice a month, less often than that, and not at all. These were coded with numbers 1 to 6 respectively. Non-responses were omitted. A total score was produced by summing the numbers which represents an aggregated amount of parental time spent. The next section presents detailed findings for each question at child ages 5 and 7 for fathers and mothers. A summary is available in table 4.1 (page 52).

4.1 Father's Involvement With Child

Reading

Figures 4.1 and 4.2 show the distributions of how often fathers in the analytical sample read to their children at ages 5 and 7. As children grow, fathers generally spend less time with them regardless of bonding activity. While there were 80% (8,170 out of 10,206 cases) of fathers reading to their child at least once a week at age 5, the number fell to 73% (6,504 out of 8,908 cases) when the same children reached age 7.

Figure 4.1: Bar Chart For Father Reading (Wave 3, Child Age 5)

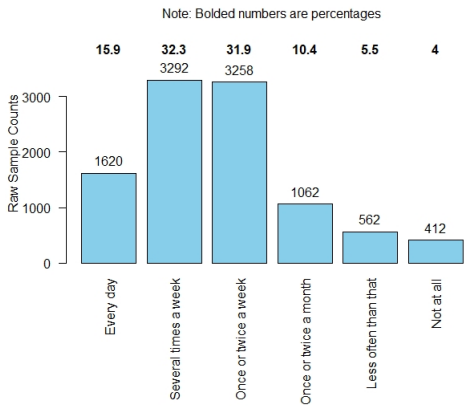
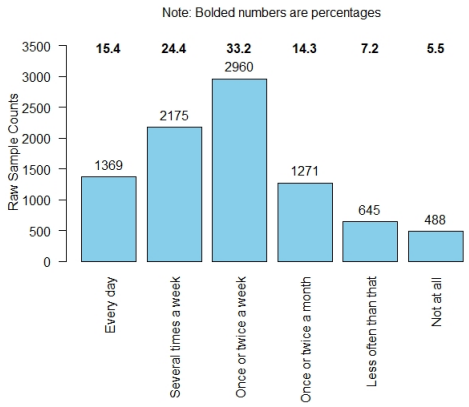


Figure 4.2: Bar Chart For Father Reading (Wave 4, Child Age 7)



Telling Stories

As with reading, fathers tended to spend less time telling stories at age 7 compared to at age 5. These stories may be derived from real events or be fictitious in nature. There were 53% (5,438 out of 10,206 cases) of fathers who tell stories to their child at least once a week at child age 5. At age 7, the figure fell by 7 percentage points to 46% (4,110 out of 8,908 cases). The percentage of fathers who do not tell stories to their children at all rose from 11% at age 5 to 17% at age 7.

Figure 4.3: Bar Chart For Father Telling Stories (Wave 3, Child Age 5)

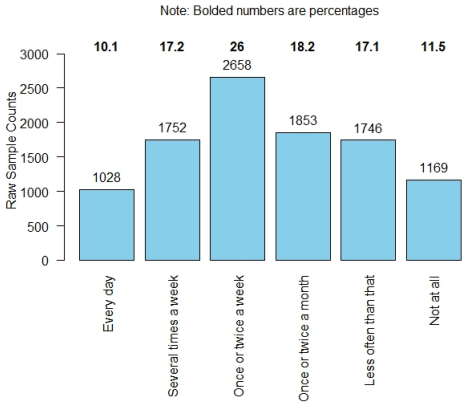
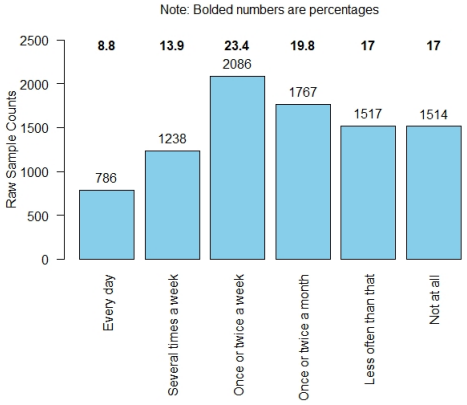


Figure 4.4: Bar Chart For Father Telling Stories (Wave 4, Child Age 7)



Doing Musical Activities

British fathers were relatively musically inclined, with more of them doing musical activities with their children compared to telling stories or drawing. While there were 70% (7,095 out of 10,206 cases) of fathers who do musical activities with their child at least once a week at age 5, the number fell by 6 percentage points to 62% (5,561 out of 8,908 cases) when the children were aged 7. 7% of fathers did not do musical activities with their child at all at age 5, the percentage doubling to 14% once they are at age 7.

Figure 4.5: Bar Chart For Father Musical Activities (Wave 3, Child Age 5)

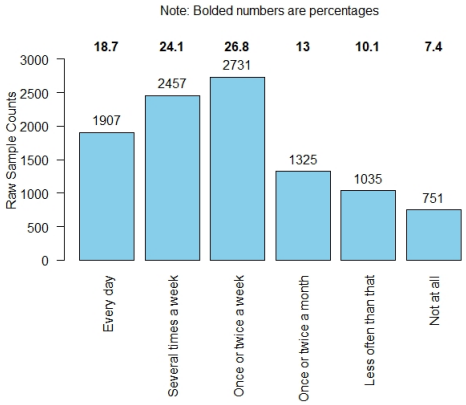
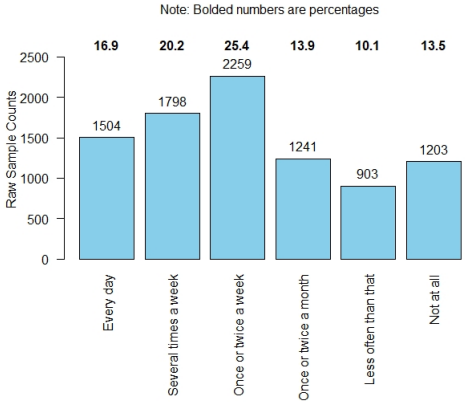


Figure 4.6: Bar Chart For Father Musical Activities (Wave 4, Child Age 7)



Drawing or Painting

Only about half or 49% (4,966 out of 10,206 cases) of fathers drew or painted with their child at least once or twice a week at age 5. The figure fell sharply by 17 percentage points to 32% (2,837 out of 8,908 cases) at age 7. This was the poorest performing category out of every activity performed by either parent. The modal category at age 5 was 'once or twice a week' (32% of the wave 3 sample), but the modal category once the child hits age 7 was 'once or twice a month' (32% of the wave 4 sample).

Figure 4.7: Bar Chart For Father Draws or Paints (Wave 3, Child Age 5)

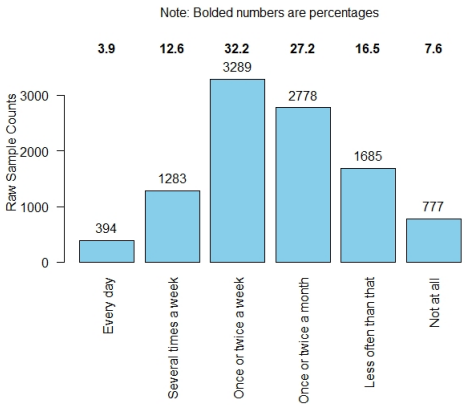
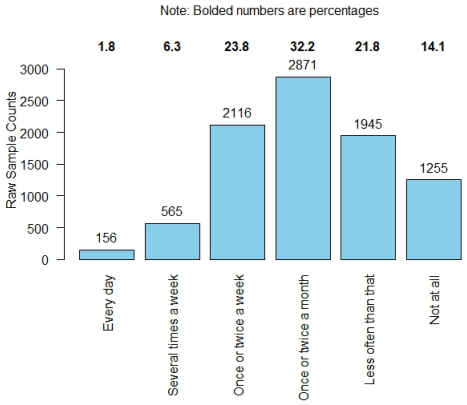


Figure 4.8: Bar Chart For Father Draws or Paints (Wave 4, Child Age 7)



Playing Physically Active Games

This result provides evidence for the sexed nature of parenting, with fathers showing stronger involvement in physical activities. 78% (7,965 out of 10,206 cases) of fathers at child age 5 played physically active games at least once a week, falling 6 percentage points to 72% (6,415 out of 8,908 cases) at child age 7. These numbers are consistently higher than the percentage of mothers who were involved which bucks the trend of mothers being more involved than fathers.

Figure 4.9: Bar Chart For Father Physical Games (Wave 3, Child Age 5)

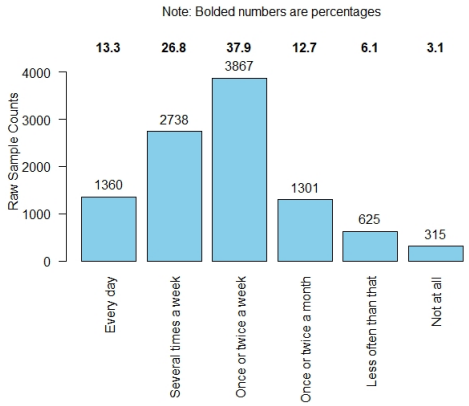
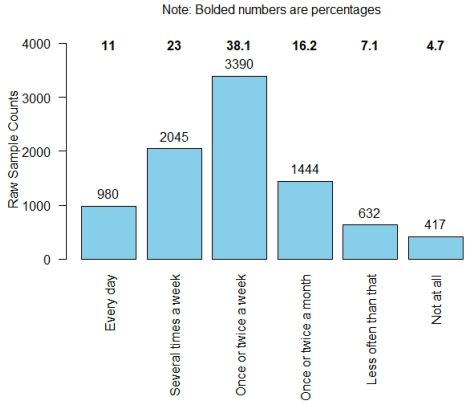


Figure 4.10: Bar Chart For Father Physical Games (Wave 4, Child Age 7)



Playing Games or Toys Indoors

This category shows another sharp decline in paternal involvement, with 84% (8,612 out of 10,206 cases) of fathers playing games or toys indoors with their child at least once a week at age 5, but 74% (6,595 out of 8,908 cases) of them doing the same at child age 7. This is a decline of 10 percentage points, brought about mainly from the drop in the 'every day' and 'several times a week' categories (17% and 32%, to 10% and 25% respectively).

Figure 4.11: Bar Chart For Father Plays Indoors (Wave 3, Child Age 5)

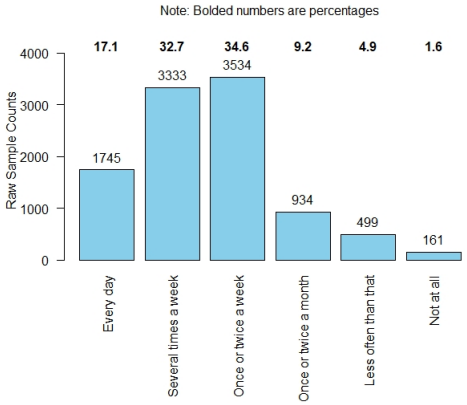
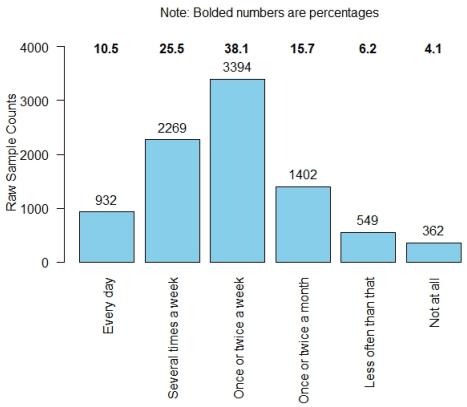


Figure 4.12: Bar Chart For Father Plays Indoors (Wave 4, Child Age 7)



Taking to Playground or Park

51% (5,211 out of 10,206 cases) of fathers took their child to the playground or park at least once a week at age 5. This number fell to 46% (4,082 out of 8,908 cases) when the child was at age 7. This decrease of 5 percentage points is relatively small, and the distributions of cases across all 6 categories is relatively unchanged.

Figure 4.13: Bar Chart For Father Takes to Park (Wave 3, Child Age 5)

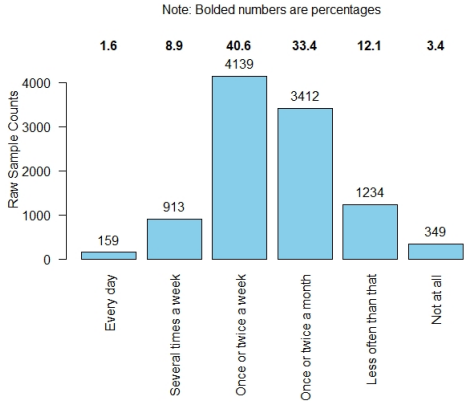
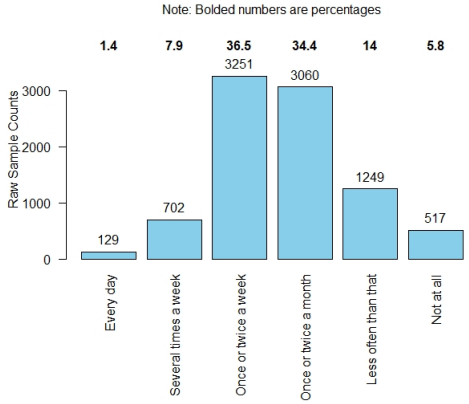


Figure 4.14: Bar Chart For Father Takes to Park (Wave 4, Child Age 7)



4.2 Mother's Involvement With Child

Reading

This category registered the highest level of involvement by either parent in any measured activity. At age 5, 95% (11,186 out of 11,815 cases) of mothers in the wave 3 sample read to their child at least once a week. This fell slightly at age 7, with the corresponding number for mothers reading at least once a week falling to 90% (9,513 out of 10,563 cases) of the wave 4 sample.

Figure 4.15: Bar Chart For Mother Reading (Wave 3, Child Age 5)

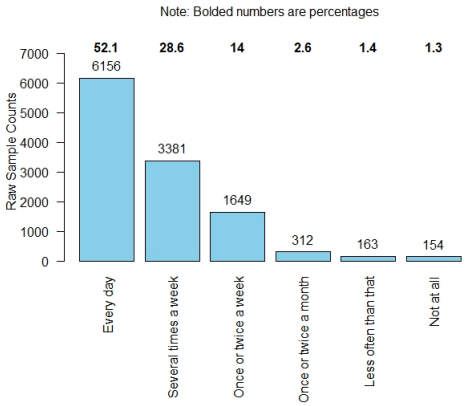
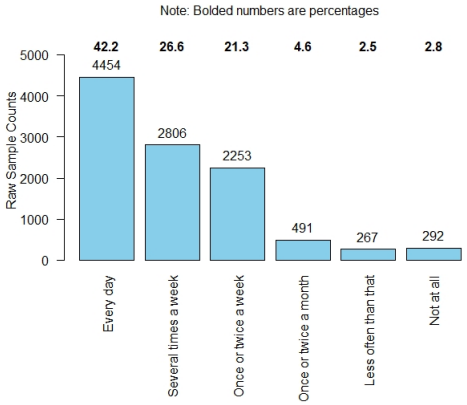


Figure 4.16: Bar Chart For Mother Reading (Wave 4, Child Age 7)



Telling Stories

Mothers were generally on an even footing with fathers with respect to telling stories to their children. At age 5, 57% (6,707 out of 11,815 cases) of mothers told stories to their children at least once a week, falling 11 percentage points to 46% (4,857 out of 10,563 cases) at age 7. The percentage of fathers telling stories to their children at least once a week at age 7 was also 46% of the analytic sample. The percentage of mothers who do not tell stories to their children at all at age 5 was 11%, but the number rose to 19% of the sample when their children grew to age 7.

Figure 4.17: Bar Chart For Mother Telling Stories (Wave 3, Child Age 5)

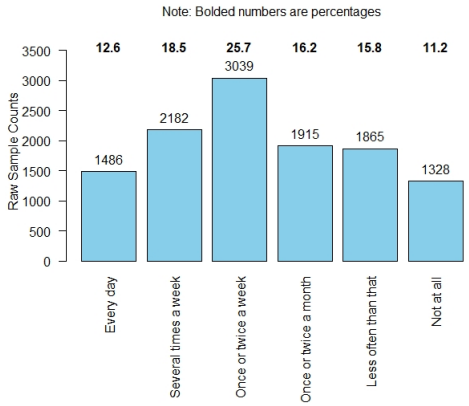
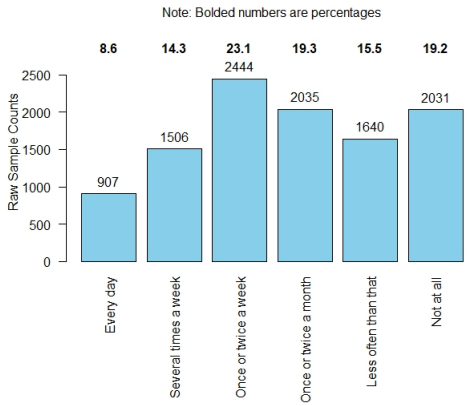


Figure 4.18: Bar Chart For Mother Telling Stories (Wave 4, Child Age 7)



Doing Musical Activities

Musical activities were another avenue where mothers were highly involved, with 86% of the analytic sample at age 5 (10,134 out of 11,815 cases) purporting to do musical activities with their child at least once a week. The percentage of mothers fell by 10 percentage points to 76% (7,988 out of 10,563 cases) when the children were at age 7.

Figure 4.19: Bar Chart For Mother Music Activities (Wave 3, Child Age 5)

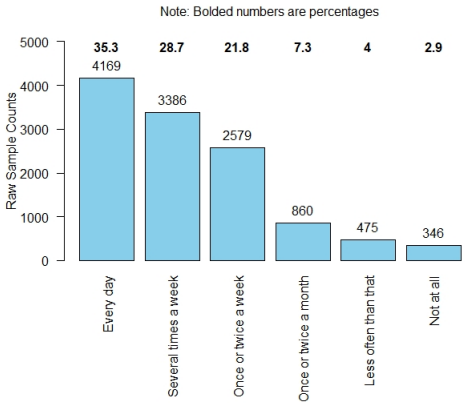
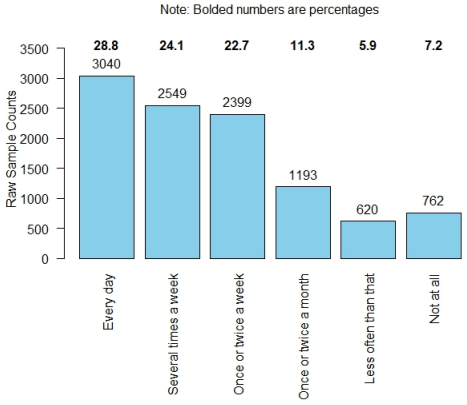


Figure 4.20: Bar Chart For Mother Music Activities (Wave 4, Child Age 7)



Drawing or Painting

Mothers were relatively uninvolved in drawing and painting. At wave 3, when the child was aged 5, 66% of mothers (7,787 out of 11,815 cases) drew or painted with their child at least once a week. The number fell sharply by 23 percentage points to 43% (4,552 out of 10,563 cases) at wave 4 when the child was aged 7. The modal category changed from 'once or twice a week' at age 5 (32% of the wave 3 sample) to 'once or twice a month' at age 7 (containing 32% of the wave 4 sample).

Figure 4.21: Bar Chart For Mother Draws or Paints (Wave 3, Child Age 5)

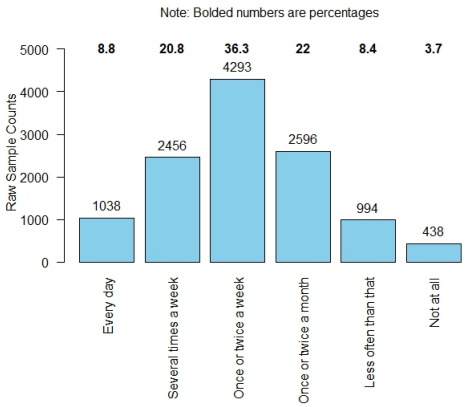
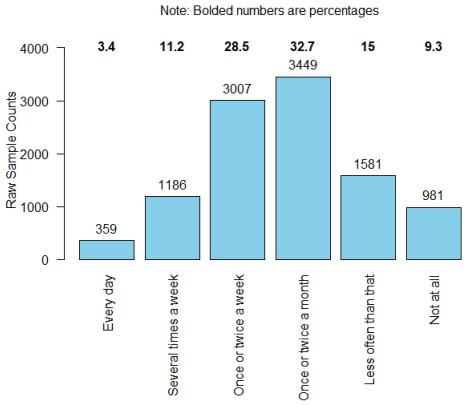


Figure 4.22: Bar Chart For Mother Draws or Paints (Wave 4, Child Age 7)



Playing Physically Active Games

As stated previously, fathers outperformed mothers in this metric. 60% of mothers in wave 3 or at child age 5 (7,106 out of 11,815 cases) played physically active games with their child at least once a week, the number dropping 11 percentage points to to 49% (5,212 out of 10,563 cases) at wave 4 when the child is aged 7.

Figure 4.23: Bar Chart For Mother Physical Games (Wave 3, Child Age 5)

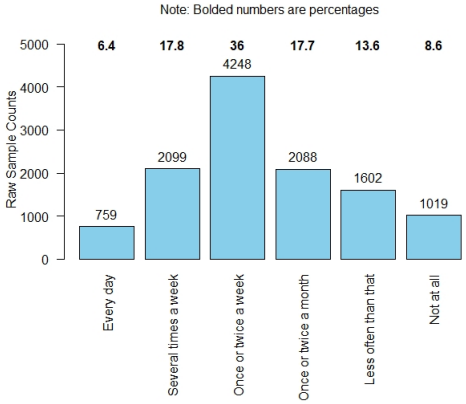
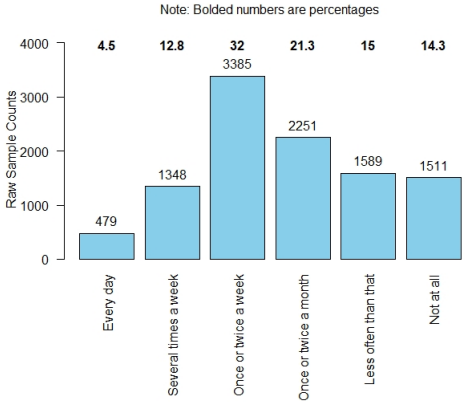


Figure 4.24: Bar Chart For Mother Physical Games (Wave 4, Child Age 7)



Playing Games or Toys Indoors

Together with for drawing and painting, this measure also showed a significant drop between waves 3 and 4. While 85% of mothers (10,024 out of 11,815 cases) reported playing games or toys indoors at least once a week with their child at age 5, the number dropped 16 percentage points to 69% (7,252 out of 10,563 cases) at child age 7. This drop was lead by categories 'every day' and 'several times a week', falling from 17% and 33% to 10% and 25% respectively. The percentage of mothers reporting playing 'once or twice a week' actually rose from 35% in wave 3 to 38% in wave 4.

Figure 4.25: Bar Chart For Mother Plays Indoors (Wave 3, Child Age 5)

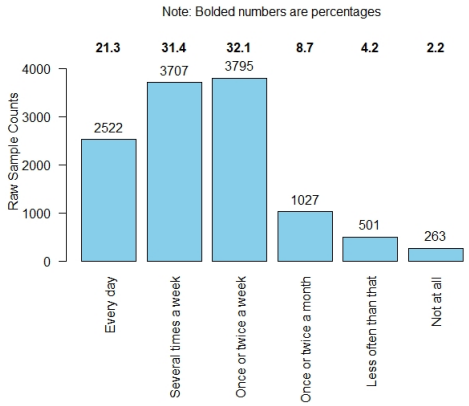
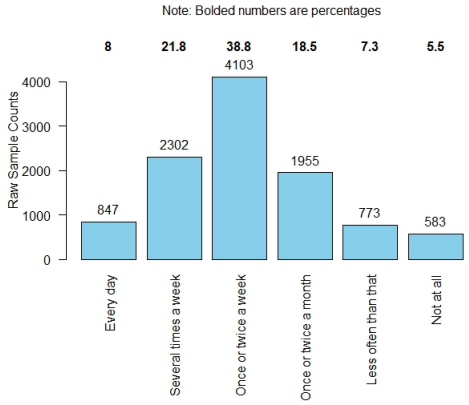


Figure 4.26: Bar Chart For Mother Plays Indoors (Wave 4, Child Age 7)



Taking to Playground or Park

61% (7,234 out of 11,815 cases) of mothers in wave 3 or at child age 5 took their child to the playground or park at least once a week. The number fell 10 percentage points to 51% (5,383 to 10,563 cases) in wave 4 or at child age 7. The shape of the distributions of cases across the 6 categories remains relatively unchanged, with the first three categories falling and the last three categories rising in relative tandem.

Figure 4.27: Bar Chart For Mother Takes to Park (Wave 3, Child Age 5)

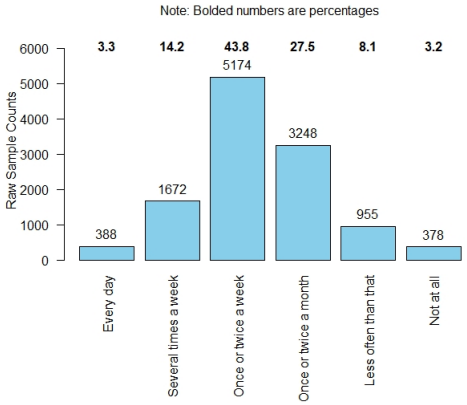
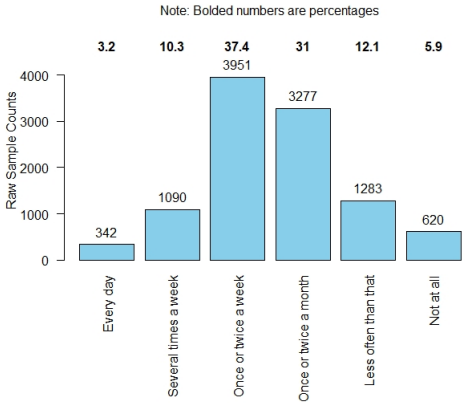


Figure 4.28: Bar Chart For Mother Takes to Park (Wave 4, Child Age 7)



A summary of the previous figures is given in table 4.1 below, presenting the percentage of each parent performing each activity at least once a week when the child is aged 5 and 7.

Table 4.1: Individual Parental Activity Percentages at Ages 5 and 7

Variable *Father*	At least once a week, age 5 (%)	At least once a week, age 7 (%)
Reads to child	80.0	73.0
Tells stories	53.3	46.1
Musical activities	69.5	62.4
Draws or paints	48.7	31.8
Plays physical games	78.0	72.0
Indoor toys/games	84.4	74.0
Takes to playground	51.1	45.8
Variable *Mother*	At least once a week, age 5 (%)	At least once a week, age 7 (%)
Reads to child	94.7	90.1
Tells stories	56.8	50.0
Musical activities	85.8	75.6
Draws or paints	65.9	43.1
Plays physical games	60.1	49.3
Indoor toys/games	84.8	68.7
Takes to playground	61.2	51.0

Two overarching conclusions can be drawn from table 4.1. First, that British parents become less involved regardless of bonding activities once their child grows from age 5 to age 7. Second, that mothers are much more heavily involved in the bonding activities that they do with their children compared to fathers. The sole exception to this is in playing physically active games, which might be expected if we consider that outdoor sports and physical games tends to be a more masculine activity associated with fathers more than mothers. Regardless, when considering all activities together, mothers were decidedly more involved in bonding with their children than fathers. The next part of this analysis quantifies and amalgamates the responses into an aggregate measure.

4.3 Framework and Typology

The six responses given to each of the questions (from 'every day' to 'not at all') were coded with numbers 1 to 6. To generate an amalgamated score, the responses for each of the seven questions were summed, with a higher score representing lower levels of parental involvement. It is important to note that the original coding reflects an ordinal, not cardinal, ranking of the responses. In other words, the 'magnitude' of involvement (in this case, the frequency of activity) may not rise in a constant manner. The difference between a parent who professes doing an activity 'every day' versus 'several times a week' may not be the same difference as a parent professing to do it 'once or twice a week' versus 'once or twice a month' etc, even though it is a difference in score of 1.

Regardless, in an effort to produce a parsimonious metric, a summing of scores was done for ease of analysis and interpretation. This score gives information about both the type and frequency of activities done, allowing us to see the combined degree of involvement for each parent across the multiple activities. Combining the scores for fathers and mothers at MCS waves 3 and 4 yields the following results, displayed in table 4.2. Lower scores represent higher levels of involvement.

Table 4.2: Combined Scores for Parental Involvement

Variable	Median	Mean	Standard Deviation
Father, Wave 3	21	21.69	5.46
Mother, Wave 3	19	19.73	5.23
Father, Wave 4	23	23.55	5.59
Mother, Wave 4	22	22.60	5.57
Father, Waves 3 + 4	44	45.08	9.71
Mother, Waves 3 + 4	41	42.24	9.44

The range of scores are from 7 (responding 'every day' to all 7 questions) to 42 (responding 'not at all' to all 7 questions). All of the sample means

were greater than their respective medians, indicating a slight right skew of the distributions. Table 4.2 confirms the findings above, with mothers being more involved on average (with a lower score) than fathers at both waves 3 and 4, and parental involvement of both parents to fall from waves 3 to 4, or child age 5 to 7. To arrive at one metric taking into account both waves 3 and 4, the individual scores for waves 3 and 4 were added up for fathers and mothers separately, forming the last two rows of table 4.2.

Finally, for the purposes of performing later cross-tabulations, a four-category typology will be created based on the scores above. For each individual wave, a cutoff score of 21 will be used, and for the combined metric, the cutoff will also be doubled to 42. Scores lower than 21 will be defined as having low levels of overall involvement while scores greater than or equal to 21 will be considered having high levels of involvement. Four groups will be created: both parents with low levels of involvement (coded 0), fathers having low involvement with mothers having high involvement (coded 1), fathers having high involvement with mothers having low involvement (coded 2), and both parents having high levels of involvement (coded 3) The result of this classification is presented in table 4.3 below. Percentages may not always add to 100 due to rounding.

Table 4.3: Typology of Parental Involvement

Variable	FL/ML (%)	FL/MH (%)	FH/ML (%)	FH/MH (%)
Wave 3	2744 (27)	2990 (29)	1370 (13)	3069 (30)
Wave 4	4255 (48)	1965 (22)	1319 (15)	1342 (15)
Combined	2764 (36)	2043 (27)	1034 (13)	1858 (24)

F: father, M: mother; H: high, L: low

Combining fathers and mothers into a single variable reveals striking trends. When children were aged 5 (MCS wave 3), a total of 59% of the cases were found in the categories with high levels of maternal involvement. Only 43% of cases had fathers reporting high levels of involvement. When the children were aged 7 (MCS wave 4), parents were again seen to have their involvement

levels drop off. 37% of cases had mothers reporting having high levels of involvement, and 30% of cases had fathers reporting likewise. Strikingly, the category where both fathers and mothers report low levels of involvement contained 48% of the wave 4 sample.

The multiple figures and tables confirm the same finding: that parents, whether it is the father or mother, become less involved when the child ages from 5 to 7. Fathers are less involved with their children than mothers at both wave 5 and 7, and the drop in involvement is relatively equal on average although there are fluctuations in the drop in each of the individual activities.

4.4 Associates of Parental Involvement

To investigate the associates of parental involvement, this analysis will therefore use parental involvement scores (waves 3 and 4) of fathers and mothers separately as the outcome variables. This analysis will first run individual OLS regressions with each variable individually without any controls (model 1 in tables 4.4 and 4.5) before running a combined multivariate OLS regression with all the variables used together (models 2 and 3 in table 4.4 and 4.5). Table 4.4 shows the associations for paternal involvement and table 4.5 shows the associations for maternal involvement. Since parental involvement has been reverse-scored such that higher scores represent less involvement, a positive coefficient translates to an association with lowered levels of parental involvement. A negative coefficient translates to an association with higher levels of parental involvement.

One of the weaknesses of this approach is that while questions on parental involvement were equally asked of fathers and mothers in waves 3 and 4, the vast majority of the other questions (which went into the formation of the control variables) was from information pertaining to or derived from mothers in their capacity as their child's primary caregiver. While this does not present any problems when investigating maternal involvement, this might bias some of the results when examining paternal involvement given that information on the dependent variable (paternal involvement) and the independent variables come from different sources (father vs. mother-reported metrics). Examples include variables on household income, maternal education (no data was given on paternal education), or mother-reported/defined ethnicity. Model 1 regresses paternal involvement on each variable individually, model 2 regresses the control variables together in a multivariate model, and model 3 regresses all control variables together with the score of parental involvement from the other parent. Variables from data originating in surveys after wave 4 are excluded as these come after the outcome variables of parental involvement.

Table 4.4: Associations of Paternal Involvement

Variables	(1) Individual	(2) Multivariate	(3) With Maternal Care
Constant		54.882***	40.553***
Maternal Involvement			0.314***
Family income	-3.573***	-2.588***	-2.425***
Paternal employment (wave 3)			
In work			
Not in work	0.109	-2.909***	-3.001***
Maternal employment (wave 3)			
In work			
Not in work	2.046***	0.426	0.726*
Mother's educational qualification			
Not classifiable			
NVQ level 1	-0.284	1.842	2.260*
NVQ level 2	-2.144***	0.121	0.948
NVQ level 3	-3.350***	-0.693	0.395
NVQ level 4	-4.024***	-0.932	0.332
NVQ level 5	-4.436***	-0.887	0.343
Overseas qualification only	0.335	1.001	1.170
Child age			
13			
14	0.254	0.436	0.295
15	1.884	0.906	1.169
Child sex			
Female			
Male	-1.155***	-1.350***	-1.544***
Child ethnicity			
White			
Mixed	0.304	0.036	-0.246
Indian	0.951	1.721	0.905
Pakistani	5.648***	3.191**	1.517
Bangladeshi	6.362***	5.829**	3.696
Black Caribbean	5.971***	4.021*	1.261
Black African	2.204	0.601	-0.904
Other (including Chinese)	2.129*	2.139	1.251
Number of siblings			
0			
1	0.827*	1.446**	0.890*
2	1.874***	2.010***	1.285**
$\geq$3	3.453***	3.325***	2.526***
Father's age at childbirth	0.126***	0.110***	0.109***
Mother's age at childbirth	0.086***	0.138***	0.060
Child birthweight			
>2.5kg			
$\leq$2.5kg	0.159	-0.433	-0.445
Adjusted R^2		0.066	0.149

*** $<$ 0.001 ** $<$ 0.01 * $<$ 0.05

Variables	(1) Individual	(2) Multivariate	(3) With Maternal Care
Child gestational age			
≥37 weeks			
<37 weeks	-0.256	-0.585	-0.332
Child has longstanding illness			
No			
Yes	-0.078	0.078	0.268
Mother drinking during pregnancy			
Never			
Under once a month	-0.453	0.149	-0.129
1-2 times a month	-0.989*	-0.097	-0.356
1-2 times a week	-0.645	0.465	-0.096
3-4 times a week	-1.632	-1.039	-1.193
5-6 times a week	-1.533	-4.038	-3.958
Every day	0.547	1.733	0.604
Mother smoking during pregnancy			
Never smoked			
Stopped during pregnancy	-1.795***	-1.277**	-1.037*
Smoked throughout pregnancy	0.795*	0.379	0.037
Breastfeeding duration			
No breastfeeding			
Less than 7 days	-1.119***	-1.202**	-0.775*
1 week to 3 months	-0.841*	-0.305	-0.200
3 months to 6 months	-1.397***	-0.617	-0.296
Above 6 months	-1.996***	-1.163*	-0.844
Mother openness	-0.188***	-0.087*	0.005
Mother conscientiousness	-0.180***	-0.083	-0.052
Mother extraversion	-0.170***	-0.079*	-0.068
Mother agreeableness	-0.017	0.043	0.081
Mother neuroticism	0.120***	0.065	0.034
Maternal depression or anxiety			
No			
Yes	0.770**	0.678*	0.566
Child has regular bedtime			
Never			
Sometimes	-1.402	-1.447	-1.095
Usually	-2.281***	-1.835*	-1.360
Always	-2.534***	-1.986*	-1.264
Discipline (Wave 3)	0.011	0.081**	0.048
Mother longstanding illness			
No			
Yes	0.462	-0.452	-0.287
Adjusted R^2		0.066	0.149

*** < 0.001 ** < 0.01 * < 0.05

Note: parental involvement is reverse coded such that lower scores represent greater levels of involvement. Negative coefficients are associations with more parental involvement.

Table 4.5: Associations of Maternal Involvement

Variables	(1) Individual	(2) Multivariate	(3) With Paternal Care
Constant		46.885***	30.900***
Paternal Involvement			0.283***
Family income	-2.739***	-0.530	0.145
Paternal employment (wave 3)			
In work			
Not in work	2.060***	0.279	1.066
Maternal employment (wave 3)			
In work			
Not in work	0.979***	-0.978***	-1.096***
Mother's educational qualification			
Not classifiable			
NVQ level 1	-2.875***	-1.404	-2.007*
NVQ level 2	-4.203***	-2.520***	-2.795***
NVQ level 3	-5.416***	-3.521***	-3.335***
NVQ level 4	-6.206***	-4.159***	-3.872***
NVQ level 5	-6.678***	-4.212***	-3.770***
Overseas qualification only	-0.792	-0.802	-0.979
Child age			
13			
14	0.530*	0.787**	0.361
15	-0.696	-0.665	-1.095
Child sex			
Female			
Male	1.116***	0.753**	0.979***
Child ethnicity			
White			
Mixed	0.523	0.842	0.882
Indian	2.315***	2.488**	2.068*
Pakistani	5.935***	4.919***	4.846***
Bangladeshi	6.816***	7.220***	5.089**
Black Caribbean	5.972***	7.108***	7.632***
Black African	4.094***	4.821***	4.596**
Other (including Chinese)	2.771***	2.165*	2.196*
Number of siblings			
0			
1	1.031**	1.701***	1.377***
2	2.002***	2.358***	1.791***
$\geq$3	3.616***	2.505***	1.581**
Father's age at childbirth	0.126***	-0.014	-0.026
Mother's age at childbirth	0.118***	0.250***	0.206***
Child birthweight			
$>$2.5kg			
$\leq$2.5kg	0.085	-0.199	0.143
Adjusted R^2		0.099	0.175

*** $<$ 0.001 ** $<$ 0.01 * $<$ 0.05

Variables	(1) Individual	(2) Multivariate	(3) With Paternal Care
Child gestational age			
≥37 weeks			
<37 weeks	-0.484	-0.660	-0.642
Child has longstanding illness			
No			
Yes	-0.669*	-0.802*	-0.636
Mother drinking during pregnancy			
Never			
Under once a month	0.391	0.953**	0.823*
1-2 times a month	-0.199	0.799	0.766
1-2 times a week	0.581	1.740***	1.629***
3-4 times a week	-0.182	0.705	0.735
5-6 times a week	0.416	1.003	0.841
Every day	2.539	2.647	3.043
Mother smoking during pregnancy			
Never smoked			
Stopped during pregnancy	-1.631***	-0.616	-0.300
Smoked throughout pregnancy	0.775**	1.000**	0.963*
Breastfeeding duration			
No breastfeeding			
Less than 7 days	-1.204***	-1.132***	-0.936**
1 week to 3 months	-0.983**	-0.116	-0.214
3 months to 6 months	-1.348***	-0.827*	-0.753
Above 6 months	-1.710***	-0.643	-0.625
Mother openness	-0.415***	-0.312***	-0.278***
Mother conscientiousness	-0.304***	-0.105*	-0.081
Mother extraversion	-0.221***	-0.044	-0.006
Mother agreeableness	-0.247***	-0.106*	-0.126**
Mother neuroticism	0.108***	0.086**	0.083**
Maternal depression or anxiety			
No			
Yes	0.508*	0.452	0.122
Child has regular bedtime			
Never			
Sometimes	-2.043**	-1.696*	-1.066
Usually	-2.921***	-1.937**	-1.273
Always	-3.932***	-2.814***	-1.998**
Discipline (Wave 3)	0.090***	0.097***	0.082**
Mother longstanding illness			
No			
Yes	0.232	-0.343	-0.415
Adjusted R^2		0.099	0.175

*** < 0.001 ** < 0.01 * < 0.05

Note: parental involvement is reverse coded such that lower scores represent greater levels of involvement. Negative coefficients are associations with more parental involvement.

Some of the key variables not used included maternal distress as it counts the number of waves out of 6 which the mother was distressed, and thus includes data produced after MCS wave 4. Maternal employment status at waves 4 and 6 were also not included in the model, the wave 3 variable was used instead. The mother's 'current' smoking and alcohol consumption behaviour was also excluded as this data came from MCS wave 6. Child age was used even though the variable took values of 13, 14, and 15 which were not the child ages at MCS wave 4. This was because the children's dates of birth, used as a categorical variable, would not have changed and they would have been aged 6, 7, and 8 which would have produced the same coefficients per category. The same goes for child ethnicity, which was assumed to have been constant regardless of the wave at which the data was drawn from. Even though the mother's five-factor psychological personality traits were drawn from MCS wave 6 data, it was on balance included as firstly this data was not available in other earlier waves, and secondly that there is compelling evidence which suggests that personality as defined by the five-factor scale is relatively permanent and remains largely unchanged in adults (DeYoung et al., 2007).

Associates of Paternal involvement

Firstly, none of these findings in the above two tables are causal in nature; they merely explore the associational relationships between parental involvement and a variety of different psychological, demographic, and socio-economic variables to see if paternal and maternal involvement exists along any gradient. Between the multivariate models (models 2 and 3 in both tables), associations between maternal involvement and the independent variables seem to be much more significant compared to for paternal involvement. This is expected because many of the variables have to do with the mother's own endowment or behaviour, such as maternal psychological distress, her educational qualifications, or breastfeeding duration, and are likely to influence her child involvement behaviour.

The factors which seem to associate most significantly with paternal involvement are economic variables of family income and paternal employment, as well as demographic variables child sex, the number of siblings the child has, and the age of the father.

Family income is significantly associated with paternal involvement at the 0.1% level across all three models. The initial coefficient size of -3.57 was reduced in its magnitude to -2.59 and -2.43 when controls were added, representing a powerful positive relationship between income and paternal involvement. Since parental involvement was reverse-coded, negative coefficients represent greater degrees of involvement; positive coefficients mean less involvement. The coefficients for paternal employment was also significant with magnitudes of -2.91 and -3.00 in models 2 and 3. Fathers who are unemployed tend to be more involved with their children.

The sex of the child was also highly significant in predicting the extent of paternal involvement spent. Fathers tended to be more involved with their child if they were male as compared to if they were female, and this difference was maximised once maternal involvement was controlled for. The fact that the coefficient increased in magnitude when controls were used suggests that the sex of the child is a powerful predictor of paternal involvement, becoming stronger once other variables are accounted for. Child ethnicity produced generally weak associations between different independent variables and paternal involvement. While a bivariate regression in model 1 showed significant relationships for a number of ethnicities, this disappeared once controls including maternal involvement were added.

The number of siblings that the child has was also highly significant in predicting parental involvement, with a larger number of siblings being associated with lowered levels of parental involvement spent. Compared to only children, having any number of siblings reduces the parental involvement that is spent on them. The more number of siblings the child has, the less paternal involvement is spent on them, evidenced by the generally increasing

magnitude of the positive coefficients as the number of siblings rises across the categories.

Associates of Maternal involvement

The constants for maternal involvement in models 2 and 3 take the values of 46.61 and 30.78, while the ones for paternal involvement are 54.73 and 40.47. The lower values for maternal involvement reinforces the findings of the previous sections that mothers do much more when caring for their child than fathers.

One initial difference is that while family income was significantly associated with paternal involvement, it was not associated to maternal involvement once controls were added. Family income may not predict maternal involvement, but maternal income seems to be able to do so. Mothers who are not in work tend to be more involved with their children compared to working mothers. This is, however, a much weaker relationship compared to that between paternal involvement and paternal employment. This suggests that the father's involvement is much more strongly related to economic factors compared to the mother's involvement.

Maternal educational qualification is highly associated with maternal involvement; generally speaking, the higher the educational qualification a mother achieves, the more she tends to be involved with her child. For maternal involvement, the coefficients for educational qualifications have the highest magnitude of any of the negative coefficients. Maternal education therefore seems to be the strongest predictor of maternal involvement within the limits of this particular model. One potential bias which may inflate this coefficient would come from how the measurement of involvement uses questions asking about musical activities, drawing, or games which either require some formal training (e.g. in playing musical instruments) or require higher cognitive capacities (e.g. playing potentially complicated games like card or board games). Mothers who are less educated might spend more *time* per se, but this would not be fully captured in this analysis.

Child sex is another significantly associated variable. Mothers tended to be more involved if their child was a girl compared to if they had a male child. While not of too-large a magnitude, this contrasts to the earlier finding where fathers tended to be more involved in bonding activities with their child if they were male compared to if they were female. Parents therefore tend to be more biased towards their child if they are the same gender as them. Next, as with paternal involvement, the more siblings a child has, the less involved the mother seems to be towards them.

Child ethnicity tended to be significant associated with maternal involvement, while not being significant for paternal involvement. This variable yielded the largest of any of the positive coefficients, showing that non-white ethnicities in families were powerfully associated with a lowered level of maternal involvement (but not paternal involvement). The size of the coefficients ranged from a low of 2.07 (Indian ethnicity) to a high of 7.63 (Black Caribbean ethnicity) showing that compared to white children, ethnic minority children tend to have far less maternal involvement.

Mothers who drank while pregnant and mothers who smoked throughout pregnancy also tended to be less involved with their children compared to mothers who did not drink or did not smoke. Mothers who breastfed their children were also more involved with them in their post-infancy years. These were significant relationships but the magnitudes of the coefficients are very small. Regularity of the child's bedtime was also positively associated with maternal involvement, and discipline was also significantly associated but the small coefficient suggests a negligible size of association.

Lastly, this model suggests that the mother having psychological traits of openness, agreeableness, and neuroticism are significantly associated with higher degrees of maternal involvement. Mothers who are open to new experiences and who are open-minded tended to be more involved with their children. Agreeableness is also positively associated with maternal involvement, showing that mothers who tended to be conflict-avoiding were more

involved with their children. Finally, neuroticism was negatively associated with maternal involvement, which is in line with expectations given how neuroticism represents a psychological propensity towards negative emotion and anxiety.

5 | Child Socio-emotional Development

Throughout the 6 MCS surveys, the primary caregivers (which were almost always mothers) were asked to report on their perception of their own child's psychopathology in the context of social and emotional behaviour in a 25-item questionnaire called the Strengths and Difficulties Questionnaire (SDQ). Slightly different versions of the same core questionnaire were given to children at different ages to reflect the changing key considerations at different stages of childhood[1]. These questions are grouped into 5 categories: hyperactivity, conduct problems, emotional symptoms, peer relationships, and prosocial behaviour. An example questionnaire is available in Appendix A. From these 5 categories of questions, four metrics can be derived which will be used as separate outcome variables representing different aspects of child socio-emotional behaviour.

- The Total Difficulties Score (TDS) is derived from summing the scores from the first four categories: hyperactivity, conduct problems, emotional symptoms, and peer relationships.
- The Externalising Difficulties Score is derived from summing the scores from the hyperactivity and conduct problems categories.
- The Internalising Difficulties Score is derived from summing the scores from the emotional symptoms and peer relationship categories.
- Lastly, the Prosocial Difficulties Score is derived from the standalone score of the prosocial behaviour category.

This analysis will focus primarily on the scores taken from the MCS wave 6 as it is the most recently available data at the time of analysis. These four socio-emotional difficulty scores found in the MCS wave 6 data will be used as the outcome variables in later analysis in this chapter. It will begin by briefly recapitulating the key predictor variables of parental involvement. It

[1]See https://www.sdqinfo.org/

will next go through the list of control variables used before launching into the core analysis and results. The main method of use here will be multivariate OLS regression. Finally, it will present results of some sensitivity analysis using specification curves.

5.1 Statistical Model and Variable Selection

Given that the outcome variables in this section are continuous in nature, a multivariate OLS regression will be used as the method of analysis with the following model:

$$Y = \beta_0 + \beta_1 X + \beta_2 Z_a + \beta_3 Z_b + ... + \epsilon$$

Y represents the four different measures of socio-emotional difficulties, X represents the variables of parental involvement, and the Z_n variables are covariates. The β_n terms are the coefficients and ϵ is the error term. The magnitude and significance of the coefficients derived will form the basis of the resulting analysis. The study will run several models (described in section 5.2) using different combinations of controls to enable comparisons of the coefficients of the key predictor variables.

5.1.1 Outcome and Predictor Variables

There are four outcome variables: **the Total, Externalising, Internalising, and Prosocial Difficulty Scores**. These four main outcomes are drawn from the MCS wave 6 (child age 14). The same four measures will also be constructed from the MCS waves 3, 4, and 5 (child ages 5, 7, and 11 respectively) but will be used as control variables instead. This is to test whether parental involvement remains a valid predictor of socio-emotional difficulties after variation in scores of previous waves was accounted for. It allows us to ask whether the variation in wave 6 scores were associated with factors in only wave 6 or if the variation was already present in earlier waves.

For each of the five categories of emotional, conduct, hyperactivity, peer, and prosocial behaviour, the primary caregivers were asked the extent to which their child displayed five different behavioural traits with three possible responses: not true, somewhat true, and certainly true. These were coded with scores 0, 1, and 2 respectively, and the scores were summed for each category. Some questions were asked in the negative and responses to those were reverse coded before summing. This resulted in each of the five categories having a range of scores from 0 (no difficulties) to 10 (maximum difficulties). The Total Difficulties Score (TDS) thus can take values from 0 to 40 as it is constructed by summing four categories. By the same token, the Externalising Difficulties Score and Internalising Difficulties Score can take values from 0 to 20, and the Prosocial Difficulties Score takes values from 0 to 10. Note that prosocial difficulty are reverse-scored. All of these will be treated as continuous variables, with higher numbers representing greater degrees of socio-emotional difficulties.

The key predictor variable in this case would be **parental involvement**. For this analysis, two forms will be used: the continuous form separating the scores for paternal and maternal involvement as individual variables (found in table 4.1), and the categorical form combining the level of involvement of both parents in one measure (found in table 4.2).

5.1.2 Covariates

Since the main outcome variables are derived from the MCS wave 6, all the control variables mentioned in Chapter 3 will be used, as well as the variables representing socio-emotional difficulties at waves prior to wave 6. A summary of the variables to be used is given in the following paragraphs.

Economic control variables of **family income** and **maternal employment** will be used. Family income is an averaged figure constructed by first taking logarithms of of each wave's household income before calculating the arithmetic mean. Next, maternal employment was derived from a question asking

mothers if they were or were not in work at wave 6.

The **highest maternal education qualification** as of MCS wave 6 was also used, based on the UK's National Vocational Qualification (NVQ) scale. The **age of the father and mother at childbirth** were also used.

A number of variables around the demographic characteristics of the child were used: **child age**, **sex**, **siblings** and **ethnicity** (the 8-category variable) were used as control variables.

Child health endowment variables were used, referring to variables associated with their mother's pregnancy or other long-term factors associated with infancy. These include **child birthweight**, **gestational age**, **longstanding illness**, and **breastfeeding duration**. The mother's extent of **drinking and smoking during pregnancy** was also included.

Finally, there are a set of factors associated with the child's current lived household environment as well as the mother's current set of physical and psychological health endowments. These include the mother's five-factor personality traits covering **openness, conscientiousness, extraversion, disagreeableness, and neuroticism**. **Maternal psychological distress**, **maternal depression**, and **maternal longstanding illness** were used as separate variables. **A change in the mother's relationship from wave 5 to 6** was also factored in. Information on whether the **mother was currently smoking and the extent of her drinking** was also used. Whether or not the **child has a regular bedtime** was used as a corollary for regularity and order in the household. **Discipline** was also factored in.

After all of the cases with missing values for any of the above variables were removed, the final analytical sample size which will be used for the entirety of the analysis in section 5.2 and beyond was $N = 3,576$. This is important in ensuring that N does not vary across the various regression models used in the analysis, eliminating one possible source of bias. Section 5.2.1 will allow the $N's$ to vary when performing sensitivity analysis.

5.2 Analysis and Results

5.2.1 Statistical Model Specifications

Before beginning multivariate analysis, this section will present results derived from regressing the socio-emotional behaviour on each variable individually. It will use the processed sample of $N = 3,576$. Then, the multivariate regression models will take the following specifications across 7 models:

- Model 1 will regress a socio-emotional difficulty measure on paternal and maternal involvement without any controls.
- Model 2 will regress the given socio-emotional difficulty measure on parental involvement, and add in key demographic variables of the parents and child including paternal and maternal age, child age, sex, siblings, and ethnicity. This will henceforth constitute the base specification.
- Model 3 will take the base specification and add in economic variables of household income and employment as control variables.
- Model 4 will use the base specification and add the mother's highest educational qualification.
- Model 5 will use the base specification, adding in variables associated with the child's lived environment and mother's behaviour including her five-factor personality traits, psychological distress, depression, longstanding illness, change in relationship status, her wave 6 smoking and drinking behaviour, the regularity of the child's bedtime, and discipline use.
- Model 6 will use the base specification and add in the child health endowment variables of child birthweight, gestational age, longstanding illness, breastfeeding duration, and the mother's drinking and smoking during pregnancy.

- Model 7 takes the base specification and controls for the relevant socio-emotional difficulty metric in waves 3, 4, and 5 to ascertain whether the association is still present once earlier variation is controlled.

This process will be repeated for each of the four socio-emotional difficulty measures. The results of these are displayed in tables 5.1 to 5.5, showing coefficients associated with the total, externalising, internalising, and prosocial difficulties score respectively.

Initial Findings for Individual Associations

All of the four socio-emotional difficulty measures vary similarly to one another. Many of the associates for the total difficulties score and the externalising and internalising scores have similar directions of associations, even if their magnitudes may be different. Table 5.1 shows that, superficially speaking, most of the coefficients for the total difficulties score may be approximated by summing the respective coefficients for externalising and internalising difficulties. This is likely due to the fact that the total difficulties score is simply a sum of the child's externalising and internalising difficulties score. Prosocial difficulties is also positively associated with the total, externalising, and internalising difficulties. This is because prosocial difficulties are reverse-scored compared to the three other socio-emotional difficulty measures, so negative coefficients show positive relationships. What is distinct is that paternal and maternal involvement are associated to different outcomes. Paternal involvement seems to associate only with total, externalising, and internalising, while maternal involvement seems to associate with total, externalising, and prosocial difficulties.

Another finding from table 5.1 would be how relatively unimportant paternal and maternal involvement seems to be in predicting a child's total difficulties score when no controls are used. This is because of the relatively small sizes of the coefficients when compared with the other variables in the same columns. Since the range of scores for each socio-emotional difficulty are different, it is inappropriate to compare coefficients between different measures.

Table 5.1: Individual Associations for Socio-emotional Difficulty Metrics

Outcome Variable (Wave 6):	Total Difficulties	Externalising	Internalising	Prosocial
Paternal Involvement	0.033***	0.014*	0.019***	-0.004
Maternal Involvement	0.033**	0.025***	0.008	-0.019***
Family income	-3.236***	-1.648***	-1.589***	0.279***
Maternal employment				
In work				
Not in work	2.143***	0.944***	1.198***	-0.126
Maternal education				
Not classifiable				
NVQ level 1	-1.124	-0.481	-0.644	-0.521*
NVQ level 2	-2.318***	-0.945**	-1.373***	-0.108
NVQ level 3	-2.523***	-1.157**	-1.366***	-0.285
NVQ level 4	-3.421***	-1.613***	-1.809***	-0.101
NVQ level 5	-3.870***	-1.838***	-2.032***	0.074
Overseas qualification	0.761	0.487	0.273	-0.346
Father's age at childbirth	-0.088***	-0.056***	-0.032***	0.016**
Mother's age at childbirth	-0.124***	-0.076***	-0.048***	0.018**
Child age				
13				
14	-0.315	-0.236	-0.079	-0.001
15	0.625	0.540	0.085	-0.577
Child sex				
Male				
Female	0.441*	1.007***	-0.567***	-0.529***
Number of siblings				
0				
1	-0.465	0.109	-0.575***	-0.098
2	-0.318	0.175	-0.492**	-0.196*
$\geq$3	0.508	0.585*	-0.077	-0.391**
Child ethnicity				
White				
Mixed	-0.060	0.343	-0.403	0.034
Indian	-0.187	-0.200	0.013	0.586*
Pakistani	2.198*	1.559**	0.639	0.120
Bangladeshi	-0.955	-0.820	-0.135	1.350*
Black Caribbean	4.141*	1.738**	2.40**	-0.910
Black African	-1.105	-0.420	-0.685	0.475
Others	2.240**	1.241*	1.000*	-0.201
Child birthweight				
$>$2.5kg				
$\leq$2.5kg	0.706	0.280	0.425	0.020
Child gestational age				
$\geq$37 weeks				
$<$37 weeks	0.524	0.179	0.345	0.169
Child longstanding illness				
No				
Yes	3.659***	1.416***	2.243***	-0.210**
Breastfeeding duration				
No breastfeeding				
Less than 7 days	-1.136***	-0.689***	-0.447**	0.108
1 week to 3 months	-0.654*	-0.430**	-0.223	0.034
3 months to 6 months	-1.716***	-1.061***	-0.655***	0.062
Above 6 months	-1.735***	-0.950***	-0.785***	0.262*
Drink during pregnancy				
Never				
Under once a month	-0.350	-0.170	-0.179	-0.052
1-2 times a month	-0.576	-0.116	-0.460*	-0.107
1-2 times a week	-0.129	0.144	-0.273	-0.254*
3-4 times a week	-1.403	-0.396	-1.007*	0.111

*** $<$ 0.001 ** $<$ 0.01 * $<$ 0.05

Outcome Variable (Wave 6):	Total Difficulties	Externalising	Internalising	Prosocial
5-6 times a week	-3.721*	-2.373*	-1.348	0.242
Every day	0.482	0.431	0.051	-0.269
Smoke during pregnancy				
Never smoked				
Stopped during pregnancy	0.609*	0.364*	0.245	-0.078
Smoked through pregnancy	2.025***	1.297***	0.728***	-0.345***
Mother openness	-0.090***	-0.054***	-0.036*	0.046***
Mother conscientiousness	-0.249***	-0.118***	-0.131***	0.072***
Mother extraversion	-0.167***	-0.051***	-0.115***	0.050***
Mother agreeableness	-0.184***	-0.108***	-0.077***	0.096***
Mother neuroticism	0.280***	0.108***	0.171***	-0.034***
Maternal distress				
No waves				
1 wave	1.133***	0.495***	0.638***	-0.066
2 waves	2.645***	1.034***	1.611***	-0.351***
3 waves	3.150***	1.448***	1.702***	-0.272*
4 waves	3.982***	1.843***	2.138***	-0.285*
5 waves	5.338***	2.361***	2.977***	-0.594***
All 6 waves	6.208***	2.509***	3.698***	-0.414*
Maternal depression				
No				
Yes	2.099***	0.826***	1.273***	-0.032
Maternal longstanding illness				
No				
Yes	1.977***	0.738***	1.239***	-0.107
Change in relationship				
No change				
Became partnered	2.474***	1.531***	0.944*	-0.560**
Became single	2.106***	0.826**	1.280***	-0.324*
Mother smokes				
No				
Yes	1.910***	1.167***	0.743***	-0.209*
Mother drinking				
Never				
Monthly or less	0.628*	0.377*	0.251	-0.252*
2 to 4 times a month	-0.231	0.022	-0.253	-0.282**
2 to 3 times a week	-0.812**	-0.213	-0.599***	-0.151
4 or more times a week	-0.489	-0.201	-0.288	-0.235*
Child regular bedtime				
Never				
Sometimes	-0.585	-0.254	-0.332	-0.127
Usually	-1.894***	-1.089***	-0.806*	-0.024
Always	-1.945***	-1.157***	-0.788*	0.123
Discipline (wave 4)	0.361***	0.247***	0.114	-0.093***
TDS (wave 6)		0.497***	0.502***	-0.128***
TDS (wave 5)	0.739***	0.391***	0.348***	-0.104***
TDS (wave 4)	0.663***	0.368***	0.295***	-0.101***
TDS (wave 3)	0.644***	0.353***	0.291***	-0.095***
Externalising (wave 6)	1.403***		0.403***	-0.231***
Externalising (wave 5)	1.011***	0.700***	0.311***	-0.168***
Externalising (wave 4)	0.848***	0.578***	0.270***	-0.149***
Externalising (wave 3)	0.820***	0.541***	0.279***	-0.135***
Internalising (wave 6)	1.397***	0.397***		-0.128***
Internalising (wave 5)	1.052***	0.354***	0.698***	-0.117***
Internalising (wave 4)	0.963***	0.339***	0.624***	-0.111***
Internalising (wave 3)	0.830***	0.275***	0.555***	-0.095***
Prosocial (wave 6)	-1.257***	-0.804***	-0.452***	
Prosocial (wave 5)	-1.039***	-0.676***	-0.363***	0.624***
Prosocial (wave 4)	-0.890***	-0.584***	-0.306***	0.504***
Prosocial (wave 3)	-0.665***	-0.417***	-0.249***	0.350***

*** < 0.001 ** < 0.01 * < 0.05

Note 1: Results are from bivariate regressions, no controls were used

Note 2: Prosocial difficulties were reverse-scored relative to the other difficulty measures.

Without any controls, the coefficient sizes for paternal and maternal involvement on TDS of 0.033 for both are small in magnitude compared to most of the other variables. Because parental involvement was reverse scored (where low scores represent more parental involvement), a positive coefficient in this case represents lower levels of child difficulties (except prosocial). The same trends hold when looking at externalising and internalising difficulties. Even without any controls, maternal involvement was insignificant in determining internalising difficulties of the child but paternal involvement remains significant and positive, albeit with a small associational magnitude. For prosocial difficulties, the results were reversed: paternal involvement was highly insignificant while maternal involvement was statistically significant. Since prosocial difficulties were also reverse-scored, the small negative coefficient size significant at the 1% level means that higher levels of maternal involvement associates with decreased prosocial difficulties. There could be other underlying factors driving this association, and including control variables will shed more light on this relationship.

Table 5.1 also shows that, without any controls, family income and maternal psychological distress were individually the most strongly associated with child socio-emotional difficulties, reinforced by Noonan et al.'s study examining precisely these factors (Noonan et al., 2018). These two variables had the largest magnitudes of statistically significant coefficients. The five-factor psychological variables of the mother, as well as changes in the mother's relationship status were also significantly associated with child socio-emotional difficulties, though the magnitudes were much smaller in size.

5.2.2 Findings for Total Difficulties Score

Table 5.2 below gives the results for the statistical models for a child's total difficulties score. The multivariate regressions use the 7 models described earlier in the chapter, where different controls are added to a base model comprising parental involvement and demographic variables.

Table 5.2: Coefficients for Total Difficulties Score

Models:	(1)	(2)	(3)	(4)	(5)	(6)	(7)
β_0 (Constant)	4.572***	9.521***	24.231***	12.462***	4.559***	8.171***	1.891**
Paternal Involvement[1]	0.026**	0.030**	0.018	0.023*	0.021*	0.026**	0.003
Maternal Involvement[1]	0.024*	0.030**	0.026*	0.021*	0.005	0.028**	0.001
Father's age at childbirth		-0.033	-0.034	-0.032	-0.032	-0.030	-0.006
Mother's age at childbirth		-0.114***	-0.049*	-0.099***	-0.039	-0.078***	-0.003
Child age							
13							
14		-0.366	-0.336	-0.385	-0.276	-0.408*	-0.139
15		0.452	0.397	0.257	0.832	0.461	0.344
Child sex							
Female							
Male		0.427*	0.500**	0.435*	0.104	0.388*	-0.472***
Number of siblings							
0							
1		-0.937**	-0.788**	-0.900**	-0.704**	-0.621*	0.004
2		-0.927**	-1.087***	-0.833**	-0.684*	-0.671*	-0.137
≥3		-0.443	-1.379***	-0.569	-0.445	-0.365	0.348
Child ethnicity							
White							
Mixed		-0.138	-0.149	0.020	0.030	-0.114	-0.030
Indian		-0.281	-0.098	-0.216	0.190	0.158	0.053
Pakistani		1.466	-0.199	1.196	1.721	1.422	-0.422
Bangladeshi		-1.393	-2.284	-2.042	0.781	-0.365	-0.296
Black Caribbean		4.009**	3.461*	4.348**	3.633**	4.044**	1.558
Black African		-0.822	-0.684	-0.638	-0.059	-0.312	-0.663
Others		1.929*	0.904	1.663	0.871	1.765*	-0.289
Family income			-2.676***				
Maternal employment							
In work							
Not in work			1.265***				
Maternal education							
Not classifiable							
NVQ level 1				-1.340			
NVQ level 2				-2.343***			
NVQ level 3				-2.470***			
NVQ level 4				-3.187***			
NVQ level 5				-3.632***			
Overseas qualification				0.700			
Mother openness					-0.022		
Mother conscientiousness					-0.074*		
Mother extraversion					-0.065**		
Mother agreeableness					-0.057		
Mother neuroticism					0.122		
Maternal distress							
No waves							
1 wave					0.609**		
2 waves					1.505***		
3 waves					1.443***		
4 waves					1.654***		
5 waves					3.043***		
All 6 waves					3.526***		
Maternal depression							
No							
Yes					0.200		
Adjusted R^2	0.004	0.065	0.074	0.128	0.257	0.521	0.536
N	3,576	3,576	3,576	3,576	3,576	3,576	3,576

*** < 0.001 ** < 0.01 * < 0.05

Models:	(1)	(2)	(3)	(4)	(5)	(6)	(7)
(Paternal Involvement[1])	0.026**	0.030**	0.018	0.023*	0.021*	0.026**	0.003
(Maternal Involvement[1])	0.024*	0.030**	0.026*	0.021*	0.005	0.028**	0.001
Maternal illness							
No							
Yes					0.964***		
Change in relationship							
No change							
Became partnered					1.346*		
Became single					1.349***		
Mother smokes							
No							
Yes					1.317***		
Mother drinking							
Never							
Monthly or less					0.467		
2 to 4 times a month					-0.108		
2 to 3 times a week					-0.390		
4 or more times a week					-0.334		
Child regular bedtime							
Never							
Sometimes					-0.386		
Usually					-1.497**		
Always					-1.337**		
Discipline (wave 4)					0.295***		
Child birthweight							
>2.5kg							
≤2.5kg						0.327	
Child gestational age							
≥37 weeks							
<37 weeks						0.206	
Child longstanding illness							
No							
Yes						3.507***	
Breastfeeding duration							
No breastfeeding							
Less than 7 days						-0.610*	
1 week to 3 months						-0.297	
3 months to 6 months						-1.006***	
Above 6 months						-0.876*	
Drink during pregnancy							
Never							
Under once a month						-0.170	
1-2 times a month						-0.267	
1-2 times a week						0.198	
3-4 times a week						-0.750	
5-6 times a week						-2.345	
Every day						0.785	
Smoke during pregnancy							
Never smoked							
Stopped during pregnancy						0.625*	
Smoked through pregnancy						1.306***	
TDS (wave 5)							0.578***
TDS (wave 4)							0.180***
TDS (wave 3)							0.093***
Adjusted R^2	0.004	0.027	0.071	0.048	0.200	0.097	0.512
N	3,576	3,576	3,576	3,576	3,576	3,576	3,576

*** < 0.001 ** < 0.01 * < 0.05

[1] For parental involvement, larger values represent greater degrees of *uninvolvement*, and therefore positive coefficients mean that less involvement associates with more socio-emotional difficulty.

When paternal and maternal involvement were factored in together, their coefficients were a statistically significant 0.026 and 0.024 respectively. This was a decrease from their original uncontrolled coefficients of 0.033 for both in table 5.1, when the other spouse's involvement was not controlled for. The positive coefficient means that the more involved the parents are with their children at ages 5 and 7, the less total difficulties the children seem to display. Paternal involvement stopped being significant once economic variables were added in, and maternal involvement lost its significance once the child's lived environment and the mother's behaviour was factored in. For the child's total difficulties score, maternal and paternal involvement seems to be equally important as their magnitudes are highly similar in the models.

Adding key demographic variables in model 2 causes the the magnitude of the coefficients for parental involvement to maximises at 0.03 for both parents, significant at the 1% level. Model 3 suggests that the positive association of paternal involvement on child socio-emotional development can be explained by economic factors since adding in family income and maternal employment removes the statistical significance of paternal involvement while maternal involvement remains important. In a similar vein, factoring in maternal psychological and mental health-related factors in model 5 removes the explanatory power of maternal involvement, suggesting that involvement in child bonding activities *per se* is relatively unimportant and that the mother's wider psychological state and personality are more important. The child's health endowment from pregnancy-related variables in model 6 do not seem to mitigate the association of parental involvement, suggesting that (child longstanding illness aside) parental involvement is more important than long term child health relating to pregnancy. Lastly, model 7 suggests that the association between child total difficulties and parental involvement might be mediated by difficulties at earlier ages instead of only at age 14.

Tables 5.3 and 5.4 below show results for the two sub-scales that make up the total difficulties score: the externalising and internalising difficulties score.

Table 5.3: Coefficients for Externalising Difficulties Score

Models:	(1)	(2)	(3)	(4)	(5)	(6)	(7)
β_0 (Constant)	2.325***	4.552***	11.988***	5.894***	1.259	3.981***	0.858*
Paternal Involvement[1]	0.008	0.013*	0.008	0.009	0.009	0.011	-0.001
Maternal Involvement[1]	0.023***	0.022***	0.020***	0.018**	0.009	0.020**	0.000
Father's age at childbirth		-0.021	-0.021	-0.020	-0.021	-0.020	-0.003
Mother's age at childbirth		-0.064***	-0.032*	-0.056***	-0.021	-0.044**	-0.004
Child age							
13							
14		-0.249*	-0.237*	-0.257*	-0.194	-0.261*	-0.095
15		0.567	0.541	0.491	0.825	0.571	0.579
Child sex							
Female							
Male		0.984***	1.019***	0.991***	0.756***	0.975***	0.156*
Number of siblings							
0							
1		-0.198	-0.127	-0.169	-0.164	-0.026	0.126
2		-0.225	-0.303	-0.169	-0.191	-0.075	0.065
$\geq$3		-0.002	-0.448	-0.053	-0.060	0.055	0.322
Child ethnicity							
White							
Mixed		0.254	0.249	0.338	0.351	0.256	0.301
Indian		-0.249	-0.164	-0.207	0.036	0.013	-0.161
Pakistani		1.163*	0.358	1.029	1.372*	1.197*	0.207
Bangladeshi		-1.028	-1.474	-1.353	0.142	-0.504	-0.499
Black Caribbean		1.526	1.271	1.676*	1.278	1.647*	0.196
Black African		-0.485	-0.431	-0.379	-0.005	-0.227	-0.173
Others		1.004*	0.515	0.862	0.473	0.930	-0.027
Family income			-1.349***				
Maternal employment							
In work							
Not in work			0.511***				
Maternal education							
Not classifiable							
NVQ level 1				-0.676			
NVQ level 2				-0.956**			
NVQ level 3				-1.152**			
NVQ level 4				-1.505***			
NVQ level 5				-1.723***			
Overseas qualification				0.398			
Mother openness					-0.023		
Mother conscientiousness					-0.031		
Mother extraversion					-0.009		
Mother agreeableness					-0.042*		
Mother neuroticism					0.042**		
Maternal distress							
No waves							
1 wave					0.218		
2 waves					0.521**		
3 waves					0.601**		
4 waves					0.676**		
5 waves					1.256***		
All 6 waves					1.283***		
Maternal depression							
No							
Yes					0.020		
Adjusted R^2	0.005	0.049	0.077	0.064	0.186	0.088	0.511
N	3,576	3,576	3,576	3,576	3,576	3,576	3,576

*** < 0.001 ** < 0.01 * < 0.05

Models:	(1)	(2)	(3)	(4)	(5)	(6)	(7)
(Paternal Involvement[1])	0.008	0.013*	0.008	0.009	0.009	0.011	-0.001
(Maternal Involvement[1])	0.023***	0.022***	0.020***	0.018**	0.009	0.020**	0.000
Maternal illness							
No							
Yes					0.324**		
Change in relationship							
No change							
Became partnered					0.858*		
Became single					0.425		
Mother smokes							
No							
Yes					0.883***		
Mother drinking							
Never							
Monthly or less					0.247		
2 to 4 times a month					-0.006		
2 to 3 times a week					-0.089		
4 or more times a week					-0.216		
Child regular bedtime							
Never							
Sometimes					-0.350		
Usually					-0.959**		
Always					-0.912**		
Discipline (wave 4)					0.207***		
Child birthweight							
>2.5kg							
≤2.5kg						0.245	
Child gestational age							
≥37 weeks							
<37 weeks						-0.040	
Child longstanding illness							
No							
Yes						1.316***	
Breastfeeding duration							
No breastfeeding							
Less than 7 days						-0.390**	
1 week to 3 months						-0.297	
3 months to 6 months						-0.725***	
Above 6 months						-0.517*	
Drink during pregnancy							
Never							
Under once a month						-0.073	
1-2 times a month						-0.019	
1-2 times a week						0.344	
3-4 times a week						-0.009	
5-6 times a week						-1.564	
Every day						0.594	
Smoke during pregnancy							
Never smoked							
Stopped during pregnancy						0.351*	
Smoked through pregnancy						0.887***	
Externalising (wave 5)							0.540***
Externalising (wave 4)							0.157***
Externalising (wave 3)							0.065***
Adjusted R^2	0.005	0.049	0.077	0.064	0.186	0.088	0.511
N	3,576	3,576	3,576	3,576	3,576	3,576	3,576

*** < 0.001 ** < 0.01 * < 0.05

[1] For parental involvement, larger values represent greater degrees of *uninvolvement*, and therefore positive coefficients mean that less involvement associates with more socio-emotional difficulty.

Table 5.4: Coefficients for Internalising Difficulties Score

Models:	(1)	(2)	(3)	(4)	(5)	(6)	(7)
β_0 (Constant)	2.247***	4.969***	12.244***	6.568***	3.300***	4.190***	1.467***
Paternal Involvement[1]	0.018**	0.017**	0.011	0.013*	0.012*	0.015*	0.005
Maternal Involvement[1]	0.002	0.007	0.006	0.003	-0.004	0.009	0.003
Father's age at childbirth		-0.012	-0.013	-0.012	-0.011	-0.010	-0.005
Mother's age at childbirth		-0.050***	-0.017	-0.043**	-0.018	-0.035*	-0.005
Child age							
13							
14		-0.118	-0.100	-0.128	-0.082	-0.148	-0.064
15		-0.116	-0.144	-0.234	0.007	-0.110	-0.259
Child sex							
Female							
Male		-0.558***	-0.519***	-0.556***	-0.653***	-0.587***	-0.538***
Number of siblings							
0							
1		-0.738***	-0.661***	-0.730***	-0.541**	-0.595***	-0.160
2		-0.701***	-0.784***	-0.664***	-0.493**	-0.596**	-0.239
≥3		-0.441	-0.932***	-0.517*	-0.385	-0.420	-0.017
Child ethnicity							
White							
Mixed		-0.392	-0.398	-0.318	-0.322	-0.371	-0.329
Indian		-0.032	0.066	-0.008	0.154	0.144	0.197
Pakistani		0.303	-0.557	0.167	0.349	0.224	-0.522
Bangladeshi		-0.365	-0.810	-0.690	0.640	0.139	0.171
Black Caribbean		2.483**	2.190*	2.672**	2.355**	2.396**	1.505*
Black African		-0.338	-0.253	-0.259	-0.054	-0.085	-0.522
Others		0.925	0.390	0.801	0.398	0.835	-0.148
Family income			-1.327***				
Maternal employment							
In work							
Not in work			0.755***				
Maternal education							
Not classifiable							
NVQ level 1				-0.663			
NVQ level 2				-1.387***			
NVQ level 3				-1.317***			
NVQ level 4				-1.681***			
NVQ level 5				-1.909***			
Overseas qualification				0.303			
Mother openness					0.001		
Mother conscientiousness					-0.043*		
Mother extraversion					-0.057***		
Mother agreeableness					-0.015		
Mother neuroticism					0.080***		
Maternal distress							
No waves							
1 wave					0.391**		
2 waves					0.984***		
3 waves					0.842***		
4 waves					0.977***		
5 waves					1.787***		
All 6 waves					2.243***		
Maternal depression							
No							
Yes					0.180		
Adjusted R^2	0.002	0.022	0.055	0.037	0.147	0.088	0.421
N	3,576	3,576	3,576	3,576	3,576	3,576	3,576

*** < 0.001 ** < 0.01 * < 0.05

Models:	(1)	(2)	(3)	(4)	(5)	(6)	(7)
(Paternal Involvement[1])	0.018**	0.017**	0.011	0.013*	0.012*	0.015*	0.005
(Maternal Involvement[1])	0.002	0.007	0.006	0.003	-0.004	0.009	0.003
Maternal illness							
No							
Yes					0.640***		
Change in relationship							
No change							
Became partnered					0.488		
Became single					0.924***		
Mother smokes							
No							
Yes					0.434**		
Mother drinking							
Never							
Monthly or less					0.221		
2 to 4 times a month					-0.103		
2 to 3 times a week					-0.302		
4 or more times a week					-0.119		
Child regular bedtime							
Never							
Sometimes					-0.036		
Usually					-0.538		
Always					-0.425		
Discipline (wave 4)					0.088***		
Child birthweight							
>2.5kg							
≤2.5kg						0.082	
Child gestational age							
≥37 weeks							
<37 weeks						0.245	
Child longstanding illness							
No							
Yes						2.191***	
Breastfeeding duration							
No breastfeeding							
Less than 7 days						-0.220	
1 week to 3 months						0.000	
3 months to 6 months						-0.281	
Above 6 months						-0.359	
Drink during pregnancy							
Never							
Under once a month						-0.097	
1-2 times a month						-0.248	
1-2 times a week						-0.146	
3-4 times a week						-0.740	
5-6 times a week						-0.781	
Every day						0.191	
Smoke during pregnancy							
Never smoked							
Stopped during pregnancy						0.275	
Smoked through pregnancy						0.418**	
Internalising (wave 5)							0.571***
Internalising (wave 4)							0.189***
Internalising (wave 3)							0.096***
Adjusted R^2	0.002	0.022	0.055	0.037	0.147	0.088	0.421
N	3,576	3,576	3,576	3,576	3,576	3,576	3,576

*** < 0.001 ** < 0.01 * < 0.05

[1] For parental involvement, larger values represent greater degrees of *uninvolvement*, and therefore positive coefficients mean that less involvement associates with more socio-emotional difficulty.

5.2.3 Findings for Externalising and Internalising Difficulty Scores

The metrics taken as the outcome variables were derived from the MCS wave 6, when the child was 14 years old. Individual results for externalising and internalising difficulties show mixed results for the association between parental involvement and a child's socio-emotional development scores. Externalising behaviour comprises conduct and hyperactivity problems on things like whether children constantly fidget or squirm, does not think things through before acting, cannot stay still for long, has tamper tantrums, or picks fights with other children. Table 5.3 shows that maternal involvement is more important than paternal involvement at explaining a child's externalising difficulties score. The only specification which brought the coefficient for paternal involvement to a 5% level of significance was for model 2 which included only demographic variables as controls. The coefficient for maternal involvement was also positive, indicating the positive relationship between greater maternal involvement and lowered child externalising difficulties.

Internalising difficulties, on the other hand, comprise emotional and peer-related problems such as constantly complaining, being unhappy or worrisome, tending to be solitary or whether they get picked on or bullied by other children. For these, paternal involvement was more significantly associated than maternal involvement. The coefficients for paternal involvement were positive and statistically significant, indicating a positive relationship between greater paternal involvement and lessened child internalising difficulties. The coefficients for maternal involvement, on the other hand, were at no point statistically significant. This is the opposite of the findings for externalising difficulties, reflecting the differences in the associates of parental involvement by both parents.

There are a number of factors which associates with all three difficulty measures as reflected in the three regressions (tables 5.2 to 5.4), whose coefficients remain highly significant as different sets of controls are used.

Firstly, demographic variables are an important predictor of child socio-emotional difficulties. The sex of the child was a highly important factor in predicting the three measures of child total, externalising, and internalising difficulties. For all three measures measured at wave 6, the coefficient for child sex remained highly significant across almost all of the models in measures of total, externalising, and internalising difficulty scores. Boys tended to have higher total and externalising difficulties, while girls tended to have higher internalising difficulties. Siblingship was also important in predicting the total and internalising difficulty scores, but whose coefficients were not significant for the measure of externalising difficulty scores. For total and internalising difficulties, the more siblings a child has, the lower their associated socio-emotional difficulty. Although the number of siblings does not always matter, children with siblings tend to have fewer socio-emotional difficulties compared to only children.

The two economic variables of average family income and maternal employment also yielded highly significant coefficients for total, externalising, and internalising difficulties. The directions of associations for all three measures were also the same. Family income was calculated by factoring the mean household income across all 6 survey waves. Its negative and statistically significant coefficient represents how greater family income is linked to lowered child socio-emotional difficulties. Its magnitude was also much larger than most of the other variables in the respective models, signifying how strong the association is. The coefficient for maternal employment was positive, representing that children of unemployed mothers tended to have greater socio-emotional difficulties compared to families with employed mothers.

Maternal educational qualification is another variable strongly associated with total difficulty scores and the two sub-scales of externalising and internalising difficulty scores. The coefficients for educational qualification for all three measures were negative, and its magnitude increases as educational level rises from NVQ level 1 to 5. This means that high maternal educational

qualification is associated with lower levels of child socio-emotional difficulties. This reinforces existing evidence, presented in Chapter 2, of the positive relationship between maternal education and child outcomes.

A number of variables relating to the mother's psychological state and health were also important predictors of child difficulties. The mother's personality traits, as defined by the five-factor personality traits of openness, conscientiousness, extraversion, agreeableness, and neuroticism, were also important in predicting child socio-emotional difficulty. Not all five traits were important predictors for total, externalising, and internalising difficulties. The mother's conscientiousness and extraversion were significant predictors of child total difficulty scores, with the negative coefficients showing that high degrees of openness and extraversion associating with lowered child difficulties. Her agreeableness and neuroticism were significant predictors for child externalising difficulties. The coefficient for agreeableness was negative, showing that agreeable mothers tended to have children with lowered externalising difficulties. The coefficient for neuroticism was positive, showing that mothers with propensities for negative emotion and anxiety was associated with their children having slightly higher externalising difficulties. Lastly, a mother's conscientiousness, extraversion, and neuroticism were significant predictors for child internalising difficulties. Conscientiousness and extraversion was negatively associated while neuroticism was positively associated with child internalising difficulties. Apart from personality traits, the extent of the mother's distress was also positively associated with child socio-emotional difficulties, with a higher duration of distress associated with greater difficulties.

Variables associated with the behaviour of the mother were also important, including her smoking behaviour (but not drinking) and her relationship status, especially for cases where the mother became recently single. Mothers who recently became single tended to have children who displayed greater total and internalising difficulties, but this association was not present for the

display of externalising difficulties. Similarly, mothers who smoked tended to have children who displayed more total, externalising, and internalising difficulties compared to mothers who did not smoke. The variable around discipline use when the child was aged 7 was also important. Mothers who used greater discipline tended to report their children having slightly greater total, externalising, and internalising difficulties. The magnitudes of the coefficient for discipline use was also different; the coefficient for discipline use for externalising difficulties was 0.21 while the respective coefficient for internalising difficulties was 0.09 (both significant at the 0.1% level) which suggest that greater discipline negatively associates with a child's externalising behavioural development more than it does intrinsic behavioural development.

Lastly, while many of the child health endowment and pregnancy-related variables did were not significant in predicting child socio-emotional behaviour, including them in a model had the effect of shifting key predictor variables of parental involvement (see model 6). Of these variables, child longstanding health was a highly significant predictor of child socio-emotional difficulties at the 0.1% level. The large positive magnitudes of the coefficients for longstanding health on total, externalising, and internalising difficulties means that a child having a longstanding health condition is associated with them having much greater socio-emotional difficulties. Next, while the pregnancy-related variables having to do with drinking and smoking were associated with total and externalising difficulty scores, this was less so with internalising difficulties. Greater drinking and smoking tended to associate with poorer socio-emotional outcomes. Lastly, breastfeeding was negatively associated with total and externalising difficulties, but not internalising difficulties; children who had been breastfed for longer had lower difficulty scores.

Table 5.5: Coefficients for Prosocial Difficulties Score

Models:	(1)	(2)	(3)	(4)	(5)	(6)	(7)
β_0 (Constant)	9.271***	8.990***	8.031***	9.189***	8.644***	9.123***	1.381***
Paternal Involvement[1]	0.002	-0.001	0.000	0.000	0.000	0.000	0.000
Maternal Involvement[1]	-0.019***	-0.018***	-0.018***	-0.018***	-0.012***	-0.017***	-0.003
Father's age at childbirth		0.009	0.009	0.008	0.012	0.008	0.001
Mother's age at childbirth		0.012	0.008	0.011	0.000	0.009	0.014*
Child age							
13							
14		-0.009	-0.010	-0.004	-0.040	0.002	-0.035
15		-0.673*	-0.670*	-0.658*	-0.735*	-0.673*	-0.661*
Child sex							
Female							
Male		-0.510***	-0.514***	-0.504***	-0.433***	-0.514***	-0.129**
Number of siblings							
0							
1		-0.004	-0.013	-0.008	0.000	-0.031	0.046
2		-0.092	-0.083	-0.096	-0.088	-0.115	0.012
≥3		-0.273*	-0.221	-0.264*	-0.253*	-0.282*	-0.169
Child ethnicity							
White							
Mixed		0.085	0.086	0.069	0.004	0.112	-0.007
Indian		0.617**	0.608**	0.599**	0.454*	0.568*	0.437*
Pakistani		0.343	0.440	0.330	0.091	0.322	0.404
Bangladeshi		1.409*	1.466*	1.423*	0.789	1.326*	0.987*
Black Caribbean		-0.714	-0.685	-0.766	-0.687	-0.710	-0.498
Black African		0.673	0.669	-0.636	0.464	0.630	0.469
Others		-0.089	-0.031	-0.077	0.025	-0.075	-0.047
Family income			0.173*				
Maternal employment							
In work							
Not in work			-0.041				
Maternal education							
Not classifiable							
NVQ level 1				-0.454*			
NVQ level 2				-0.135			
NVQ level 3				-3.20			
NVQ level 4				-1.67			
NVQ level 5				-0.021			
Overseas qualification				-0.376			
Mother openness					0.017*		
Mother conscientiousness					0.020*		
Mother extraversion					0.031***		
Mother agreeableness					0.057***		
Mother neuroticism					-0.009		
Maternal distress							
No waves							
1 wave					0.023		
2 waves					-0.200*		
3 waves					-0.005		
4 waves					0.095		
5 waves					-0.252		
All 6 waves					-0.098		
Maternal depression							
No							
Yes					0.164*		
Adjusted R^2	0.009	0.041	0.042	0.044	0.111	0.045	0.321
N	3,576	3,576	3,576	3,576	3,576	3,576	3,576

*** < 0.001 ** < 0.01 * < 0.05

Models:	(1)	(2)	(3)	(4)	(5)	(6)	(7)
(Paternal Involvement[1])	0.002	-0.001	0.000	0.000	0.000	0.000	0.000
(Maternal Involvement[1])	-0.019***	-0.018***	-0.018***	-0.018***	-0.012***	-0.017***	-0.003
Maternal illness							
No							
Yes					-0.070		
Change in relationship							
No change							
Became partnered					-0.365		
Became single					-0.268*		
Mother smokes							
No							
Yes					-0.152		
Mother drinking							
Never							
Monthly or less					-0.138		
2 to 4 times a month					-0.151		
2 to 3 times a week					-0.092		
4 or more times a week					-0.097		
Child regular bedtime							
Never							
Sometimes					-0.059		
Usually					-0.011		
Always					0.075		
Discipline (wave 4)					-0.075***		
Child birthweight							
>2.5kg							
≤2.5kg						-0.249	
Child gestational age							
≥37 weeks							
<37 weeks						0.297*	
Child longstanding illness							
No							
Yes						-0.177*	
Breastfeeding duration							
No breastfeeding							
Less than 7 days						-0.004	
1 week to 3 months						-0.001	
3 months to 6 months						-0.026	
Above 6 months						0.145	
Drink during pregnancy							
Never							
Under once a month						-0.037	
1-2 times a month						-0.055	
1-2 times a week						-0.255*	
3-4 times a week						0.036	
5-6 times a week						0.034	
Every day						-0.275	
Smoke during pregnancy							
Never smoked							
Stopped during pregnancy						-0.057	
Smoked through pregnancy						-0.240**	
Prosocial (wave 5)							0.448***
Prosocial (wave 4)							0.258***
Prosocial (wave 3)							0.073***
Adjusted R^2	0.009	0.041	0.042	0.044	0.111	0.045	0.321
N	3,576	3,576	3,576	3,576	3,576	3,576	3,576

*** < 0.001 ** < 0.01 * < 0.05

[1] For parental involvement, larger values represent greater degrees of *uninvolvement*, and therefore positive coefficients mean that less involvement associates with more socio-emotional difficulty.
Note: Prosocial difficulties were reverse-scored relative to the other difficulty measures.

5.2.4 Findings for Prosocial Difficulty Scores

The externalising and internalising difficulties were two sub-scales that were added together to form the total difficulty score. On the other hand, prosocial difficulties was taken as a unique category representing a different set of problems unrelated to externalising or internalising problems. While earlier measures represented things associated with conduct, mood, or hyperactivity problems, prosocial difficulties explicitly measure problems associated with their attitude towards others. While similar to peer relationship problems, it is less to do with reciprocal behaviours in a social environment and more to do with attitudes and acts of kindness such as sharing treats, toys, and stationery (as opposed to asking if they have at least one good friend or how solitary they are). Of the four difficulty scores, past prosocial difficulties are the least able to predict future prosocial difficulties. Model 7 factoring in prosocial difficulties at waves 3, 4, and 5 (on top of parental involvement and demographic variables) was only able to account for 32% of the variation in wave 6's prosocial difficulty score, the lowest percentage of the four socio-emotional difficulty measures.

Like for externalising difficulties, it is maternal involvement rather than paternal involvement which is significantly associated to prosocial difficulties. The reverse-scored measure of prosocial difficulties means that the negative coefficient translates to a positive relationship between greater maternal involvement and lowered prosocial difficulties. There is insufficient evidence to conclude that the involvement of fathers is associated with a child's prosocial difficulties (see table 5.5).

A number of other factors also significantly predict prosocial difficulties. For one, boys on average seem to have greater prosocial difficulties compare to girls. Next, unlike for the previous three socio-emotional difficulty measures, being of a non-white ethnicity is actually associated with better prosocial behaviour. Siblingship and maternal education, while important for total, externalising, and internalising difficulties, do not seem to be significant at

accounting for the variation in prosocial difficulties.

Maternal psychological traits also associate with child prosocial difficulties. The traits of extraversion and agreeableness of the mother are highly significantly associated with child prosocial difficulties. While the magnitude is slight, mothers who are more extroverted and agreeable seem to have children who tend to display less prosocial difficulties. Regularity of bedtime also seems to associate with prosocial difficulties. Compared to children who 'never' have regular bedtimes on weekdays, children who 'always' have regular bedtimes tended to have higher levels of prosocial difficulties, significant at the 0.1% level. Lastly, discipline use is also highly associated with prosocial difficulties, behaving in tandem with the other three difficulty measures. Greater discipline use is associated with greater degrees of total, externalising, and internalising difficulties, as well as being associated with a child having more prosocial difficulties.

5.2.5 Sensitivity Analysis With Specification Curves

This section of the analysis will perform sensitivity analysis using specification curves, examining the effect of varying the control variables used on the coefficient size of **paternal involvement**. For example, it will run iterations of the above regression models both with and without maternal involvement, with and without family income, or with and without maternal education as controls etc. It will also run iterations with different forms of the same variable, for example running a model with child ethnicity represented by the 6-category variable, 8-category variable, and the 11-category variable. This means that every specification iteration will be run, including the iteration without any controls, the iteration which uses all the control variables simultaneously, and every combination in between. It will extract the coefficient of the key explanatory variable paternal involvement as well as the standard errors to calculate the 95% confidence intervals.

This was done with the original sample before any subsetting of data was

done, so while the original 18,818 participants at MCS wave 1 were theoretically in the dataset, this included many instances of missing data. The N for the regression models was allowed to vary. This will be done four times, once each for the total, externalising, internalising, and prosocial difficulty scores. A total of 62,208 models were run in total for each of four outcome measures separately, presented in figures 5.1 to 5.4. The results present all viable and theoretically sound magnitudes of the coefficient for paternal involvement. Many of the resulting variables may feature near-zero magnitudes, which represent instances of potential over-controlling. The dark blue line represents the magnitude of each of the coefficients of all 62,208 models, while the light blue region represents the 95% confidence intervals of these coefficients.

The four specification curves support the earlier findings, with the coefficients across the original 7 models in tables 5.2 to 5.5 being captured within the specification curves. Firstly, figure 5.1 shows that it is possible to entirely control away the positive association of paternal involvement on a child's total difficulty score; a large majority of models had the 95% confidence intervals overlapping the $\beta = 0$ line, and many models are able to produce coefficient sizes that show a near-zero association size by changing the combination of controls used. Lastly, figure 5.1 also shows the maximum value of the coefficient being 0.048, even larger than the uncontrolled coefficient of 0.033 found earlier, represented by the sudden upward spike on the right side of the chart. While it is possible to control away the association, this shows it is possible to also go about 'specification searching' to show a strong association but that it is highly sensitive to changing the controls used. The sudden spike towards the end of the specification curve was also present for the three other figures.

Figure 5.1: Specification Curve for Total Difficulties Score

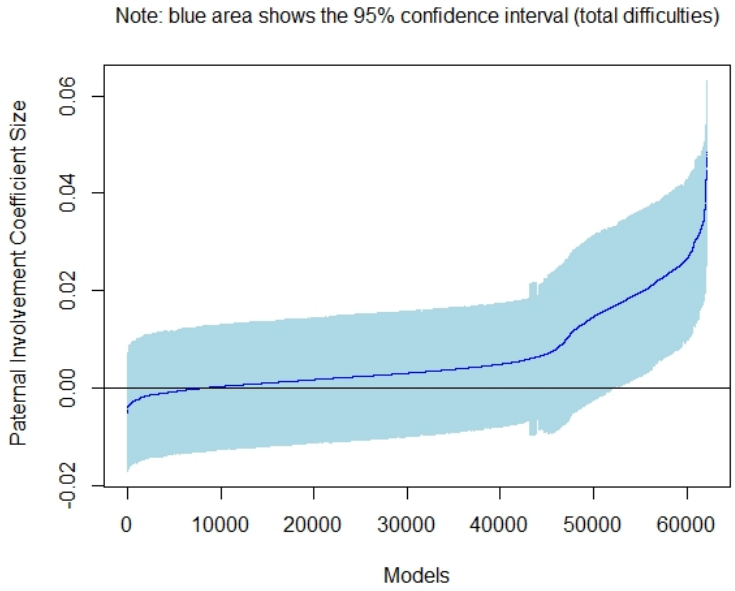


Figure 5.2: Specification Curve for Externalising Difficulties Score

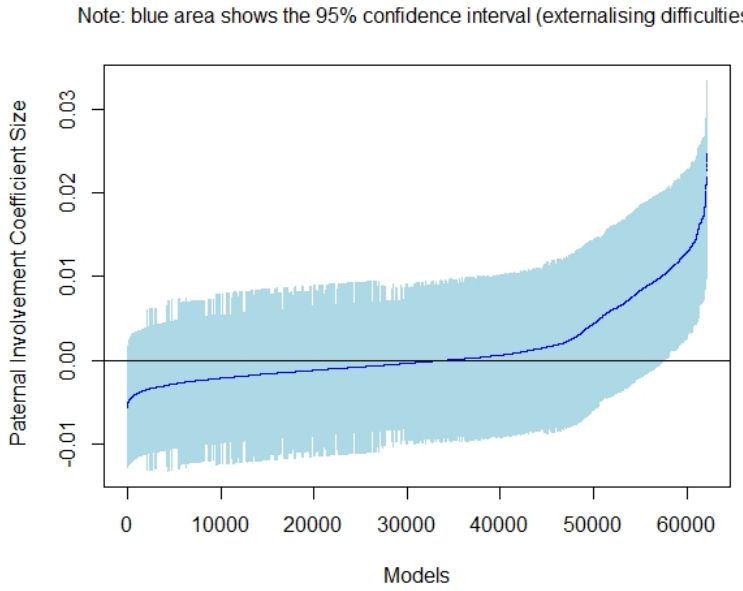


Figure 5.3: Specification Curve for Internalising Difficulties Score

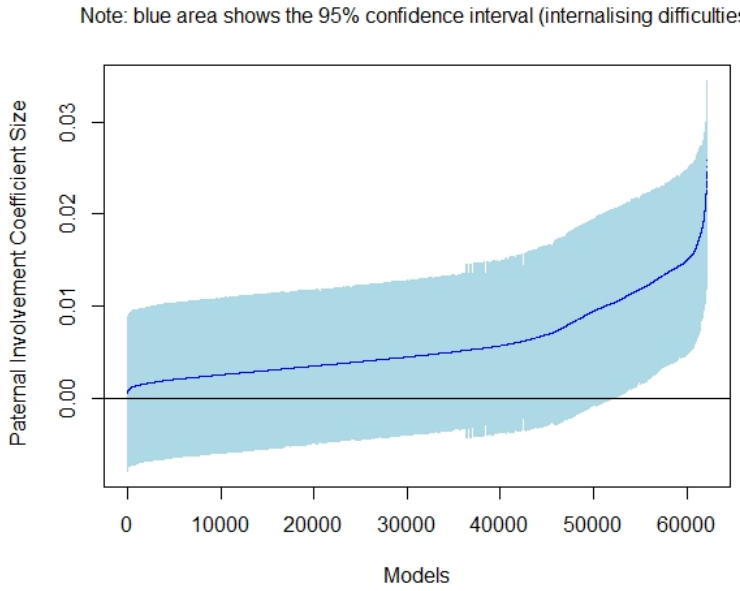
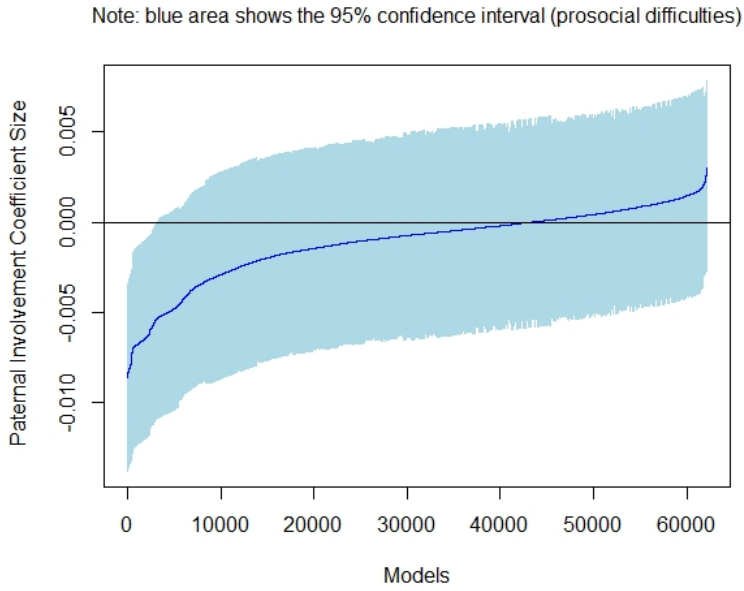


Figure 5.4: Specification Curve for Prosocial Difficulties Score



While the shape of the specification curves in figures 5.2 and 5.3 for the association between paternal involvement and externalising and internalising difficulties are similar, their positions relative to $\beta = 0$ are different. Figure 5.2 shows that the 95% confidence interval for most of the derived coefficients representing the association between paternal involvement and externalising difficulties overlaps the $\beta = 0$ line, with more than half of the found coefficients taking a negative value. The specification curve for externalising difficulties showed coefficients taking values from -0.006 to 0.024. In general, the specification curve in figure 5.2 reinforces earlier findings that paternal involvement and a child's externalising difficulties are generally unassociated with each other.

The specification curve for the association between paternal involvement and internalising difficulties are shown in figure 5.3, taking values from 0.0005 to 0.026. This also generally corresponds to the values found in the earlier section, with the coefficient sizes in tables taking a largely similar range of values. All of the 62,208 coefficients took positive values, reinforcing the suggestion that the relationship between paternal involvement and internalising difficulties is a positive one (though its magnitude may vary), regardless of the controls used.

Lastly, the specification curve representing the association between paternal involvement and prosocial difficulties are shown in figure 5.4. More than half of the coefficients found in the specification curve took negative values, with the range of values being -0.009 to 0.003. This was also representative of the earlier results, as the range of coefficients found in the previous section taking largely negative values. The original results suggests that there is insufficient evidence for an association between prosocial difficulties and paternal involvement, and both the relatively small size of the coefficients and the large degree of overlap of the confidence intervals with the $\beta = 0$ line in the specification curve reinforces this.

6 | Child Vocational Aspiration

Child aspiration tended to be given as a vocational or occupational choice and was coded in three ways: according to the occupation's socio-economic classification, its degree of masculinity or femininity, and how extrinsic or intrinsic the goals are. The aspirations of the children in the analytic sample were asked when they were aged 7 (at MCS wave 4), and therefore all predictor variables which are derived from information in waves 5 and 6 cannot be used in the following statistical analysis. The socio-economic classification was coded according to the UK's Standard Occupational Classification (SOC) 2000, the degree of masculinity and femininity was coded using the proportion of UK working-age women in that occupation, and how extrinsic or intrinsic the goals are were coded based on Deci and Ryan's (1985) self-determination theory. Intrinsic aspirations were those involving life goals to do with affiliation, community, and personal development, while extrinsic aspirations involve goals like wealth, fame, and attractiveness.

This chapter will begin by outlining how the above three outcome variables are constructed from the MCS data into a form suitable for analysis, before listing the predictor and control variables used in different statistical models. As with the previous chapter, full details of these will not be given as they can be found in the Data section in Chapter 3 as well as in Chapter 4. It will present the methods used and their results, before performing the relevant statistical analysis and concluding with sensitivity analysis.

6.1 Statistical Model and Variable Selection

Each of the three outcome variables for child aspiration, socio-economic classification, masculinity or femininity, and extrinsic or intrinsic goals, are constructed differently and therefore need different methods of analysis. The socio-economic classification of aspirations, for example, are coded into nine different categories while the latter two have been coded into four categories.

The degree of masculinity and femininity as well as the extrinsic or intrinsic nature of occupational goals can be re-coded into a binary variable each for logistic regressions to be performed. The manner in which they have been coded and/or re-coded are described in the next sub-section. For these binary outcome variables, the following logistic regression model will be used:

$$log(\frac{P(Y)}{1-P(Y)}) = \beta_0 + \beta_1 X + \beta_2 Z_a + \beta_3 Z_b + ... + \epsilon$$

$P(Y)$ represents the probability that a child's aspiration is of an extrinsic/intrinsic or masculine/feminine nature, and thus $\frac{P(Y)}{1-P(Y)}$ is its odds. X represents the categorical variable for parental involvement, the Z_n variables are the control variables. The β_n terms are logits and ϵ is the error term.

6.1.1 Outcome and Predictor Variables

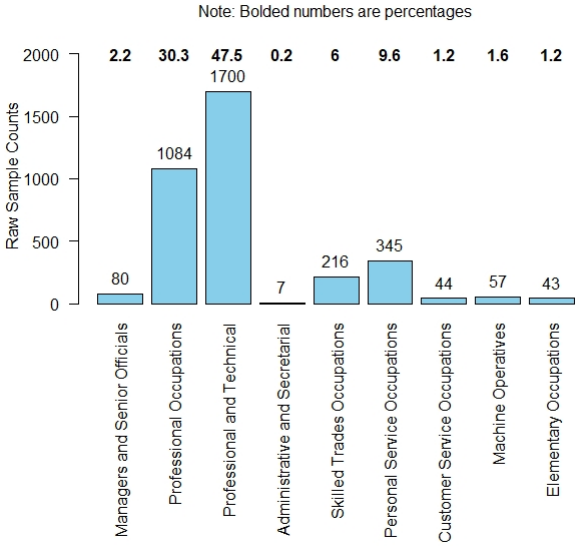
Socio-economic Classification of Occupational Aspiration

The first outcome variable of socio-economic classification of child aspirations come in nine categories within the original MCS data using the UK's SOC 2000 classification system:

- Managers and senior officials
- Professional occupations
- Associate professional and technical
- Administrative and secretarial
- Skilled trades occupations
- Personal service occupations
- Sales and customer service occupations
- Process plant and machine operatives
- Elementary occupations

As with Chapter 5, this section will use the analytic sample size of $N = 3,576$. This was the same number of cases that was used in the analysis in the previous chapter in order to provide continuity in drawing conclusions from within the same sample. A majority of the 3,576 cases fall into the categories of professional occupations and associate professional and technical, with 30.3% and 47.5% of the analytic sample in these categories respectively. The two next largest categories are personal service occupations and skilled trade occupations, with 9.7% and 6.0% of the sample respectively. The distributions of the cases are presented in figure 6.1 below.

Figure 6.1: Socio-economic Classification of Aspirations

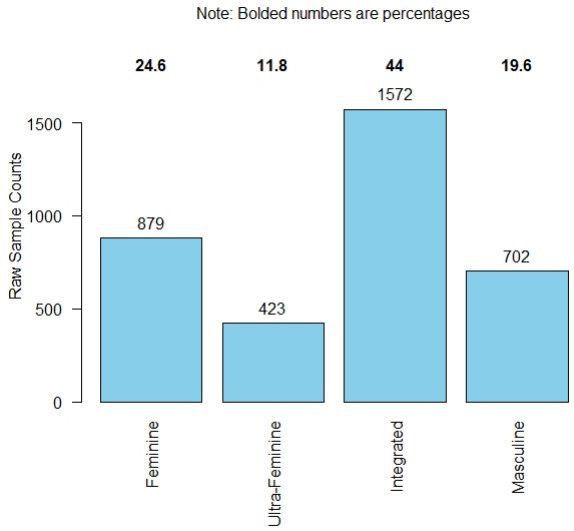


Due to the numerous number of categories as well as the unsuitability of combining them into fewer numbers of categories for parsimony, a cross-tabulation will be performed using a two-way frequency table, and a chi-square test will be used to determine the statistical significance of the distribution. One possible source of bias might come from the low frequency counts of some of the categories, especially the administrative and secretarial category which has only 7 cases in total.

Masculinity and Femininity of Occupational Aspiration

The second outcome variable of the degree of masculinity and femininity of child occupational aspirations were generally coded based on the percentage of men and women working in the occupations that the children listed. This was done using the 2nd quarter (April to June) 2008 Labour Force Survey (LFS), around the time of that the MCS wave 4 fieldwork was undertaken. The following bandings were applied: 'masculine' (<25% women), 'integrated' (25 to 49.9% women), 'feminine' (50 to 74.9% women) and 'ultra-feminine' (≥75% women). Exceptions include when children listed fantastical aspirations such as writing down 'Superman' (this was coded as masculine); these were assigned a gender where possible and appropriate. The distributions of these categories are displayed in figure 6.2 below.

Figure 6.2: Masculinity and Femininity of Aspirations



Most of the children's listed aspirations were for occupations which had more men than women. 44.0% of the analytic sample reported occupations which were in the 'integrated' category, which represents occupations with between a quarter and half of the workforce being women. 'Masculine' occupations

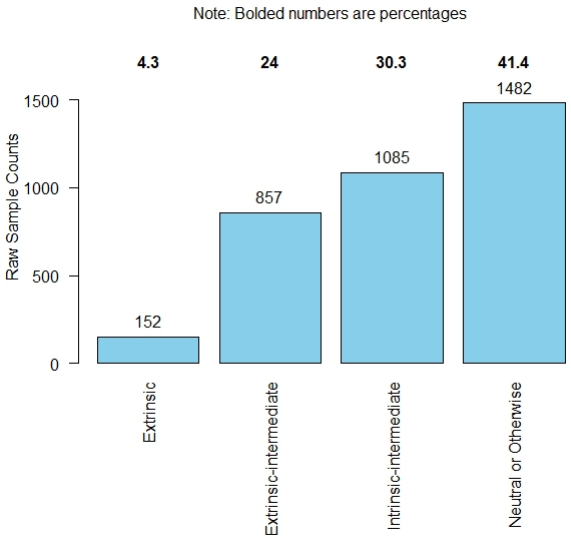
represent 19.6% of the cases. Finally, 24.6% and 11.8% of cases were in the 'feminine' and 'ultra-feminine' categories respectively.

While the category of 'integrated' was labelled as such in order to account for the gender inequalities existing in the UK workforce as a whole, this analysis will take these four variables and re-classify them into a binary variable, representing cases listing occupations where more than half of the workforce are women (feminine), and where less than half are women (masculine). Specifically, the 'feminine' and 'ultra-feminine' categories will be combined, and the 'integrated' and 'masculine' categories will be combined. This means that there will be 1,302 or 36.4% of the cases being feminine, and 2,274 or 63.6% of cases being masculine under the new binary classification system.

Extrinsic or Intrinsic Occupational Aspiration Goals

The final outcome variable regarding the extrinsic or intrinsic nature of the child's occupational goals are coded into four categories: extrinsic, extrinsic-intermediate, intrinsic-intermediate, and neutral/otherwise. These four categories were assigned by the original surveyors, and reflect how most of the children gave occupations which were extrinsic in nature. Most of the respondents listed occupations which were neutral, meaning that the occupation listed could not be reliably coded as having an intrinsic or extrinsic aspect to it, according to the documentation provided by the original surveyors. Neutral goals took 1,482 or 41.4% of all cases. There were also more intrinsic occupations than extrinsic occupations listed, with the 'intrinsic-intermediate' category having 1,085 cases or 30.3% of the sample. The 'extrinsic-intermediate' category had 857 cases or 24.0% of the sample while the 'extrinsic' category had 152 cases or 4.3% of the sample. This is represented in the bar chart in figure 6.3 below.

Figure 6.3: Extrinsic and Intrinsic Goals of Aspirations



While the original four categories will be used in a cross-tabulation, this will be re-coded for a logistic regression. The 'extrinsic' and 'extrinsic-intermediate' categories will be combined into an overall extrinsic category, and the original 'intrinsic-intermediate' category will remain as a marker for overall intrinsic goals. The neutral category will remain as it is, as this cannot be reliably broken down or combined into either of the other two categories. This will result in a three-group classification system where extrinsic, intrinsic, and neutral goals take 1009, 1085, and 1482 cases respectively, forming 28.3%, 30.3%, and 41.4% of the sample. The neutral group will be excluded from the sample before running the logistic regression on the final binary outcome variable for intrinsic-extrinsic goals.

Paternal Involvement

Lastly, as in all of the preceding chapters, **paternal involvement** is the main predictor variable used in this analysis. It will be used alongside **maternal involvement**. The two continuous variables representing the level of involvement from the father and mother in waves 3 and 4 will be used in the

logistic regressions. This score is reverse-coded such that lower scores represent more involvement. The four-category typology variable will be used instead for the cross-tabulation.

6.1.2 Covariates

Since the child vocational aspiration data came from the MCS wave 4, variables which include data from waves 5 and 6 will be excluded as they come a point in time after data on the outcome variables have collected.

Paternal and maternal employment taken from wave 3 will also be used as a binary control variable representing cases where the parents were either in work or not in work. The **mother's highest educational qualification** will also be included in the model, using the UK's National Vocational Qualification (NVQ) scale.

Despite using data from the same birth cohort, the **child's exact age in years** may differ due to differing date of births, and thus their age in years was controlled for. The **sex of the child**, **ethnicity of the child**, and the **number of siblings they had** was also factored in. The **age of both parents at childbirth** was also included.

A number of child health endowment variables were also used: the **child birthweight**, **child gestational age**, any **longstanding illness the child may have had**, the **mother's drinking and smoking behaviour during pregnancy**, and her **breastfeeding duration** were also all factored in.

Finally, a set of variables representing the child's lived household and parenting environment was also included. These comprise the **mother's five-factor personality traits**, her **depression or anxiety**, whether **the child has a regular bedtime on weekdays**, the **degree of discipline used on them**, and the **mother's longstanding illness**.

6.2 Analysis and Results

6.2.1 Statistical Model Specifications

Three different sets of analyses will be conducted, one for each of the three outcome metrics of the child's occupational aspiration: its socio-economic classification, its masculinity or femininity, and its extrinsic or intrinsic nature. First, socio-economic classification will be analysed using the method of cross-tabulations to ascertain whether parental involvement is associated with the nature of the occupations that children aspire to. Second, the degree of masculinity and femininity will be analysed with two ways, a cross-tabulation on the original four-category outcome variable, and a multivariate logistic regression on the transformed binary outcome variable (i.e. the odds of respondents professing to occupations with more than half of its current workers are women). Third, the extrinsic and intrinsic nature of occupational vocations will also be done in the same ways, with both a cross-tabulation as well as a logistic regression on a transformed binary outcome.

For the following cross-tabulations, the key predictor variable of parental involvement will be taken from Chapter 4's four-category typology with four categories of involvement: father low/mother low, father low/mother high, father high/mother low, and father high/mother high (found in table 4.2). The statistic combining waves 3 and 4's involvement is used. The distribution of these four categories in the final analytic sample after removing cases with all missing values is as reflected in table 6.1. The row percentage may not total to 100 due to rounding.

Table 6.1: Final Sample Count for Typology of Parental Involvement

Group:	FL/ML (%)	FL/MH (%)	FH/ML (%)	FH/MH (%)	Total
Total	1260 (35.2)	973 (27.2)	470 (13.1)	873 (24.4)	3576 (100)
Girls	630 (34.7)	561 (30.9)	200 (11.0)	426 (23.4)	1817 (100)
Boys	630 (35.8)	412 (23.4)	270 (15.3)	447 (25.4)	1759 (100)

F: father, M: mother; H: high, L: low

For all following multivariate logistic regressions, the key predictor variable will be the paternal and maternal involvement scores as continuous variables. The following specification of models will be used:

- Model 1 will regress the occupational aspiration variable on parental involvement without using any controls. This is the baseline specification for this logistic regression.
- Model 2 will use this baseline model and add in demographic control variables like child age, child sex, child ethnicity, number of siblings, and parental age at childbirth.
- Model 3 will use the baseline specification and add family income and parental employment.
- Model 4 uses the baseline specification and adds the mother's highest educational qualification as a control.
- Model 5 uses the baseline specification and adds control variables representing the child's lived household environment including the mother's five-factor personality traits, her depression or anxiety, whether the child has a regular bedtime, discipline use, and the mother's longstanding illness.
- Model 6 uses the baseline specification and adds child health endowment variables including child birthweight, gestational age, longstanding illness, breastfeeding duration, and the mother's drinking and smoking behaviour during pregnancy.

6.2.2 Findings for Socio-economic Classification of Occupational Aspiration

The results of the cross-tabulation between parental involvement and the socio-economic classification of child occupational aspiration, broken down by sex of child, are displayed in table 6.2 below. The labels 1 to 9 represent

the numeric values which were assigned to the coded classification groups in the UK's SOC 2000 described previously. They are: (1) managers and senior officials, (2) professional occupations, (3) associate professional and technical, (4) administrative and secretarial, (5) skilled trades occupations, (6) personal service occupations, (7) sales and customer service occupations, (8) process plant and machine operatives, (9) elementary occupations. Its distribution by sex can be seen in the rows labelled 'Row %'. The column percentages for boys and girls are calculated independently of one another such that the columns for boys and the columns for girls total to 100% each. The key figures of interest are in comparing parental involvement group percentage in aggregate versus individual socio-economic classification groups (i.e. the rows labelled 'Column %').

Table 6.2: Cross-tabulation for Socio-economic Classification of Aspiration

Child Sex	**Parental Involvement**	**Socio-economic Classification**									Row Total
		1	2	3	4	5	6	7	8	9	
Female	Father low/Mother low	16	269	208	1	21	97	8	2	8	630
	Row %	2.5	42.7	33.0	0.2	3.3	15.4	1.3	0.3	1.3	(100)
	Column %	45.7	33.9	34.4	25.0	46.7	33.4	40.0	40.0	38.1	34.7
	Father low/Mother high	9	247	176	1	10	104	6	1	7	561
	Row %	1.6	44.0	31.4	0.2	1.8	18.5	1.1	0.2	1.2	(100)
	Column %	25.7	31.1	29.1	25.0	22.2	35.9	30.0	20.0	33.3	30.9
	Father high/Mother low	5	82	71	0	7	27	2	2	4	200
	Row %	2.5	41.0	35.5	0.0	3.5	13.5	1.0	1.0	2.0	(100)
	Column %	14.3	10.3	11.8	0.0	15.6	9.3	10.0	40.0	19.0	11.0
	Father high/Mother high	5	195	149	2	7	62	4	0	2	426
	Row %	1.2	45.8	35.0	0.5	1.6	14.6	0.9	0.0	0.5	(100)
	Column %	14.3	24.6	24.7	50.0	15.6	21.4	20.0	0.0	9.5	23.4
	Female (Column) Total	35	793	604	4	45	290	20	5	21	1817
	Row %	1.9	43.6	33.2	0.2	2.5	16.0	1.1	0.3	1.2	(100)
	Column %	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)
Male	Father low/Mother low	18	114	379	1	61	23	7	19	8	630
	Row %	2.9	18.1	60.2	0.2	9.7	3.7	1.1	3.0	1.3	(100)
	Column %	40.0	39.2	34.6	33.3	35.7	41.8	29.2	36.5	36.4	35.8
	Father low/Mother high	11	56	262	1	50	10	3	14	5	412
	Row %	2.7	13.6	63.6	0.2	12.1	2.4	0.7	3.4	1.2	(100)
	Column %	24.4	19.2	23.9	33.3	29.2	18.2	12.5	26.9	22.7	23.4
	Father high/Mother low	5	42	173	0	22	10	3	13	2	270
	Row %	1.9	15.6	64.1	0.0	8.1	3.7	1.1	4.8	0.7	(100)
	Column %	11.1	14.4	15.8	0.0	12.9	18.2	12.5	25.0	9.1	15.3
	Father high/Mother high	11	79	282	1	38	12	11	6	7	447
	Row %	2.5	17.7	63.1	0.2	8.5	2.7	2.5	1.3	1.6	(100)
	Column %	24.4	27.1	25.7	33.3	22.2	21.8	45.8	11.5	31.8	25.4
	Male (Column) Total	45	291	1096	3	171	55	24	52	22	1759
	Row %	2.6	16.5	62.3	0.2	9.7	3.1	1.4	3.0	1.3	(100)
	Column %	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)

Running a chi-square test of independence for the three factors yields $\chi^2 = 742$, $df = 59$ with a corresponding p-value < 0.001 suggesting that the three factors represented above of child sex, parental involvement, and socio-economic classification of occupational aspiration are independent. Due to the very low sample counts in some of the categories, only the socio-economic groups of 'professional occupations', 'associate professional and technical', 'skilled trades occupations', and 'personal service occupations' (groups 2, 3, 5, and 6) will be discussed.

Most boys tended to profess occupational aspirations in the 'associate professional and technical' category, with 1096 (62.3%) boys in this group. The next largest group was the 'professional occupations' group, with 291 (16.5%) cases. Girls, on the other hand, were more evenly distributed between these two, with 793 (43.6%) and 604 (33.2%) in 'professional occupations', and 'associate professional and technical' respectively.

For the relevant groups with a sufficiently high sample count per cell, the distributions of cases across the groups show that the degree of parental involvement was generally unassociated with a propensity for children to disproportionately choose proportions in any socio-economic class group. The exceptions are that while cases of fathers and mothers both having low levels of involvement (Father low/Mother low) made up 34.7% of the girls' original parental involvement group, the percentage of girls aspiring to skilled trades occupations (group 5 in table 6.2) who had low levels of involvement from both parents (Father low/Mother low) is a larger-than-proportionate 46.7%. Similarly, the percentage of girls aspiring to personal service occupations (group 6) who had low levels of father involvement but high levels of mother involvement (Father low/Mother high) was 35.9%, which is also higher than the overall baseline proportion of 30.9%. The percentage of boys aspiring to personal service occupations (group 6) who had low levels of involvement from both parents (Father low/Mother low) is 41.8%, which is also significantly higher than the overall baseline proportion for that parental

involvement group of 35.8%.

While the results seem to imply that children with lower levels of parental involvement seem to aspire to 'lower' occupational aspirations involving skilled trades or personal service jobs, this analysis does not find the converse to be true. Children with higher levels of parental involvement are not disproportionately likely to aspire to 'higher' occupational aspirations of senior officials or professional occupations. This analysis might also not fully capture the subtleties of what these occupational aspirations might mean; if the children of craftsmen and service staff are close to their parents through high levels of parental involvement and thereby aspire to also be tradesmen (just like their parents), this analysis would classify this as a case where high levels of parental involvement would lead to a 'low' occupational aspiration at age 7 which may be misleading. This may be capturing the strong parent-child bond rather than a weak aspirational association instead, since children at age 7 may not fully grasp the socio-economic nature of these jobs. Regardless, overall results gives some evidence that a low level of parental involvement is linked to lower child occupational aspiration outcome at age 7, even though it cannot give evidence that high levels of parental involvement is linked to higher child occupational aspiration.

6.2.3 Findings for Masculinity and Femininity of Occupational Aspiration

The degree of masculinity or femininity of a child's professed occupational aspiration will be analysed with two methods, using a cross-tabulation as well as with a multivariate logistic regression with the transformed binary outcome variable. The original four-category variable has the groups: feminine (50 to 74.9% women), ultra-feminine ($\geq$75% women), integrated (25 to 49.9% women), and masculine ($<$25% women). On the other hand, the transformed binary variable has two groups: masculine ($<$50% women) and feminine ($\geq$50% women).

Table 6.3: Cross-tabulation for Masculinity/Femininity of Aspiration

Child Sex	**Parental Involvement**	**Masculinity or Femininity**				Row Total
		Feminine	Ultra-feminine	Integrated	Masculine	
Female	Father low/Mother low	250	116	231	33	630
	Row %	39.7	18.4	36.7	5.2	(100)
	Column %	33.9	31.9	36.2	42.3	34.7
	Father low/Mother high	230	129	182	20	561
	Row %	41.0	23.0	32.4	3.6	(100)
	Column %	31.2	35.4	28.5	25.6	30.9
	Father high/Mother low	80	34	73	13	200
	Row %	40.0	17.0	36.5	6.5	(100)
	Column %	10.9	9.3	11.4	16.7	11.0
	Father high/Mother high	177	85	152	12	426
	Row %	41.5	20.0	35.7	2.8	(100)
	Column %	24.0	23.4	23.8	15.4	23.4
	Female (Column) Total	737	364	638	78	1817
	Row %	40.6	20.0	35.1	4.3	(100)
	Column %	(100)	(100)	(100)	(100)	(100)
Male	Father low/Mother low	51	26	324	229	630
	Row %	8.1	4.1	51.4	36.3	(100)
	Column %	35.9	44.1	34.7	36.7	35.8
	Father low/Mother high	32	11	200	169	412
	Row %	7.8	2.7	48.5	41.0	(100)
	Column %	22.5	18.6	21.4	27.1	23.4
	Father high/Mother low	21	10	152	87	270
	Row %	7.8	3.7	56.3	32.2	(100)
	Column %	14.8	16.9	16.3	13.9	15.3
	Father high/Mother high	38	12	258	139	447
	Row %	8.5	2.7	57.7	31.1	(100)
	Column %	26.8	20.3	27.6	22.3	25.4
	Male (Column) Total	142	59	934	624	1759
	Row %	8.1	3.4	53.1	35.5	(100)
	Column %	(100)	(100)	(100)	(100)	(100)

The results for the cross-tabulation are shown in table 6.3. Running a chi-square test of independence for the three factors yields $\chi^2 = 1174.4$, $df = 24$ with a corresponding p-value < 0.001, which suggests that the three factors represented above of child sex, parental involvement, and the masculinity and femininity of occupational aspiration are independent.

In line with expectations, in aggregate terms boys at age 7 tended to aspire to masculine occupations, with 53.1% and 35.5% of cases in the 'integrated' and 'masculine' categories respectively. This means 88.6% of boys professed aspirations in occupations which had more men than women working in them.

This aggregate trend is less strong for girls, with 40.6% and 20.0% of girls at age 7 professing 'feminine' and 'ultra-feminine' occupations respectively. This means 60.6% of girls stated occupations with more women than men working in them, while a separate 35.1% of girls stated occupational aspirations of an 'integrated' nature. This result may be explained by how an increasing number of occupations have shifted towards greater gender parity and therefore more occupations may be in the 'integrated' category.

Parental involvement seems to influence a child's masculine or feminine occupational aspiration choices in a positive direction. Lower levels of parental involvement seems to be associated with children choosing aspirations which do not match their gendered roles. For example, while only 34.7% of all girls had low levels of father and mother involvement, 42.3% of girls who aspired to masculine occupations had low levels of father and mother involvement. Similarly, while just 35.8% of all boys in the sample had low levels of father and mother involvement, 44.1% of boys professing an ultra-feminine aspiration came from situations with low levels of father and mother involvement. The reverse, however, does not seem to be true. Children whose parents displayed high levels of involvement with them do not seem to be able to disproportionately influence them towards professing aspirations which match their sex.

The four categories above will next be collapsed into two variables, masculine and feminine, to produce the following logistic regressions, whose results are presented in table 6.4.

Table 6.4: Odds Ratios for Femininity/Masculinity of Aspiration

Models:	(1)	(2)	(3)	(4)	(5)	(6)
β_0 (Constant)	0.719	4.336***	1.944	0.891	1.302	0.769
Paternal Involvement	1.009*	0.999	1.009*	1.009*	1.009*	1.009*
Maternal Involvement	0.985***	0.994	0.985***	0.984***	0.984***	0.984***
Child age						
13						
14		0.972				
15		0.958				
Child sex						
Female						
Male		0.083***				
Child ethnicity						
White						
Mixed		0.689				
Indian		0.760				
Pakistani		1.177				
Bangladeshi		1.085				
Black Caribbean		1.040				
Black African		0.831				
Others		1.303				
Number of siblings						
0						
1		0.977				
2		0.978				
≥3		0.925				
Father's age at childbirth		0.972**				
Mother's age at childbirth		1.010				
Family income			0.852			
Paternal employment (wave 3)						
In work						
Not in work			0.982			
Maternal employment (wave 3)						
In work						
Not in work			0.982			
Maternal education						
Not classifiable						
NVQ level 1				0.718		
NVQ level 2				0.902		
NVQ level 3				0.855		
NVQ level 4				0.823		
NVQ level 5				0.722		
Overseas qualification				0.730		
Mother openness					0.991	
Mother conscientiousness					0.989	
Mother extraversion					1.007	
Mother agreeableness					1.016	
Mother neuroticism					1.012	
Maternal depression						
No						
Yes					0.960	
N	3,576	3,576	3,576	3,576	3,576	3,576

*** < 0.001 ** < 0.01 * < 0.05

Note: ORs are the odds that the child professes a feminine aspiration over a masculine one.

Models:	(1)	(2)	(3)	(4)	(5)	(6)
(Paternal Involvement)	1.009*	0.999	1.009*	1.009*	1.009*	1.009*
(Maternal Involvement)	0.985***	0.994	0.985***	0.984***	0.984***	0.984***
Child regular bedtime						
Never						
Sometimes					0.702	
Usually					0.690	
Always					0.684	
Discipline (wave 3)					0.981*	
Maternal longstanding illness						
No						
Yes					1.139	
Child birthweight						
>2.5kg						
≤2.5kg						1.774**
Child gestational age						
≥37 weeks						
<37 weeks						0.689*
Child longstanding illness						
No						
Yes						1.033
Breastfeeding duration						
No breastfeeding						
Less than 7 days						0.876
1 week to 3 months						0.877
3 months to 6 months						0.786*
Above 6 months						1.096
Drink during pregnancy						
Never						
Under once a month						1.178
1-2 times a month						0.841
1-2 times a week						1.048
3-4 times a week						1.102
5-6 times a week						1.043
Every day						1.188
Smoke during pregnancy						
Never smoked						
Stopped during pregnancy						1.108
Smoked through pregnancy						0.926
N	3,576	3,576	3,576	3,576	3,576	3,576

*** < 0.001 ** < 0.01 * < 0.05

Note: ORs are the odds that the child professes a feminine aspiration over a masculine one.

For this multivariate logistic regression, the odds ratios (ORs) reported represent the odds that a child professes a feminine occupational aspiration over a masculine one. ORs greater than 1 represent a propensity towards a feminine aspiration and ORs less than 1 a masculine one.

Factoring in child sex into the regression models completely nullifies any association between parental involvement and the degree of masculinity or

femininity of child aspiration, showing that child sex is a powerful and significant predictor of the masculinity and femininity of occupational aspiration. Without controlling for the sex of the child, the association between parental involvement and the masculinity and femininity of child occupational aspiration is slight. The coefficients of paternal involvement (1.009) and maternal involvement (0.985) do not change regardless of the type of controls used throughout the 6 models, the exception being to control for demographic factors especially child sex.

Paternal involvement seems to be less important than maternal involvement when it comes to the degree of femininity or masculinity of a child's professed occupational aspiration. The OR of 1.009 means lower levels of paternal involvement associates with a gravitation of their children towards feminine occupational aspirations, while an OR of 0.985 means that lowered levels of maternal involvement associates instead with a propensity for children to profess a masculine occupational aspiration. This association is both stronger and more statistically significant for maternal involvement compared to paternal involvement. Few other variables seem to matter. The age of the father (but not the mother) as well as increasing discipline use were both positively associated with propensities towards a masculine occupation. Children who were underweight at birth (birthweight less than or equal to 2.5 kg) seemed to have greater odds of professing feminine occupational aspirations.

6.2.4 Findings for Extrinsic or Intrinsic Goals of Occupational Aspirations

Extrinsic and intrinsic occupational aspiration goals refer to the different types of motivations behind the occupational aspirations stated by children. The four groups represent slightly different types of aspirational goals:

- Extrinsic aspirations reflect materialistic goals or concerns about image, power or popularity. Examples include 'billionaire', 'famous', or 'supermodel'.

- Extrinsic-intermediate were goals that could reflect interests in financial success, image, praise or popularity. Example occupations are 'actor', 'singer', or 'beautician'.
- Intrinsic-intermediate goals revolve around helping other people or animals such as 'nurse', 'doctor', 'teacher', or 'vet'.
- Aspirations that could not be coded were labelled 'neutral'.

These four groups were used in the cross-tabulation. The results of the initial cross-tabulation, broken down by sex, is shown in table 6.5.

Table 6.5: Cross-tabulation for Extrinsic/Intrinsic Goal of Aspiration

Child Sex	**Parental Involvement**	**Extrinsic or Intrinsic Goal**				Row Total
		Extrinsic	Ext-Intermediate	Int-Intermediate	Neutral	
Female	Father low/Mother low	30	120	303	177	630
	Row %	4.8	19.0	48.1	28.1	(100)
	Column %	35.3	35.9	32.6	37.7	34.7
	Father low/Mother high	23	91	303	144	561
	Row %	4.1	16.2	54.0	25.7	(100)
	Column %	27.1	27.2	32.6	30.7	30.9
	Father high/Mother low	11	44	87	58	200
	Row %	5.5	22.0	43.5	29.0	(100)
	Column %	12.9	13.2	9.4	12.4	11.0
	Father high/Mother high	21	79	236	90	426
	Row %	4.9	18.5	55.4	21.1	(100)
	Column %	24.7	23.7	25.4	19.2	23.4
	Female (Column) Total	85	334	929	469	1817
	Row %	4.7	18.4	51.1	25.8	(100)
	Column %	(100)	(100)	(100)	(100)	(100)
Male	Father low/Mother low	15	189	70	356	630
	Row %	2.4	30.0	11.1	56.6	(100)
	Column %	22.4	36.1	44.9	35.1	35.8
	Father low/Mother high	23	103	32	254	412
	Row %	5.6	25.0	7.8	61.7	(100)
	Column %	34.3	19.7	20.5	25.1	23.4
	Father high/Mother low	8	94	24	144	270
	Row %	3.0	34.8	8.9	53.3	(100)
	Column %	11.9	18.0	15.4	14.2	15.3
	Father high/Mother high	21	137	30	259	447
	Row %	4.7	30.6	6.7	57.9	(100)
	Column %	31.3	26.2	19.2	25.6	25.4
	Male (Column) Total	67	523	156	1013	1759
	Row %	3.8	29.7	8.9	57.6	(100)
	Column %	(100)	(100)	(100)	(100)	(100)

Performing a chi-square test of independence for the three factors yields $\chi^2 = 874.5$, $df = 24$ with p-value < 0.001 suggests that the three factors of child sex, parental involvement, and the masculinity and femininity of occupational aspiration are independent. The categories that this analysis will primarily focus on are the two extrinsic and the one intrinsic category.

For girls, the results seem to suggest that parental involvement is not associated with variation in the extrinsic or intrinsic goals that children's occupational aspirations portray. The distribution of column percentages of girls for each type of extrinsic/intrinsic group across the parental involvement groups closely match their overall baseline proportions. This means the distribution of cases between the four extrinsic/intrinsic groups did not vary strongly by parental involvement.

However, the results for boys were much clearer. Boys who had low levels of involvement from both fathers and mothers strongly shied away from extrinsic occupational aspirations, and instead displayed a propensity towards stating intrinsic-intermediate occupational aspirations. Boys who had high maternal involvement (irrespective of father involvement) seemed to have a proclivity for extrinsic occupational aspirations, while boys having low maternal involvement tended to shy away from extrinsic occupational aspirations. Extrinsic occupations seemed to be the most associated with parental involvement while the other categories appear to be relatively uninfluenced.

For the logistic regression, the four-category outcome variable was transformed into a binary variable. The two extrinsic categories were collapsed together, and the neutral group was removed in order to create a binary variable representing an intrinsic/extrinsic dichotomy. The odds ratios (ORs) shown in the regression table represent the odds that the child professes an intrinsic aspiration over an extrinsic one. As per the masculinity and femininity of child occupational aspiration, controlling for demographic factors seemed to cause the association between paternal involvement and the outcome variable to disappear and was thus not used in the baseline model.

Table 6.6: Odds Ratios for Intrinsic/Extrinsic Goal of Aspiration

Models:	(1)	(2)	(3)	(4)	(5)	(6)
β_0 (Constant)	1.448	4.974***	0.886	1.445	1.813	1.040
Paternal Involvement	1.016**	1.007	1.017**	1.017**	1.016**	1.018**
Maternal Involvement	0.976***	0.985*	0.975***	0.976***	0.975***	0.977***
Child age						
13						
14		0.947				
15		1.512				
Child sex						
Female						
Male		0.120***				
Child ethnicity						
White						
Mixed		0.959				
Indian		1.376				
Pakistani		1.376				
Bangladeshi		2.426				
Black Caribbean		0.619				
Black African		0.827				
Others		2.174				
Number of siblings						
0						
1		0.839				
2		0.698*				
≥3		0.941				
Father's age at childbirth		0.984				
Mother's age at childbirth		1.007				
Family income			1.077			
Paternal employment (wave 3)						
In work						
Not in work			1.942**			
Maternal employment (wave 3)						
In work						
Not in work			1.003			
Maternal education						
Not classifiable						
NVQ level 1				0.802		
NVQ level 2				0.823		
NVQ level 3				0.963		
NVQ level 4				0.996		
NVQ level 5				1.002		
Overseas qualification				0.758		
Mother openness					1.009	
Mother conscientiousness					0.963*	
Mother extraversion					1.006	
Mother agreeableness					1.025	
Mother neuroticism					1.026*	
Maternal depression						
No						
Yes					1.005	
N	2,094	2,094	2,094	2,094	2,094	2,094

*** < 0.001 ** < 0.01 * < 0.05

Note: ORs are the odds that the child professes an intrinsic aspiration over an extrinsic one.

Models:	(1)	(2)	(3)	(4)	(5)	(6)
(Paternal Involvement)	1.016**	1.007	1.017**	1.017**	1.016**	1.018**
(Maternal Involvement)	0.976***	0.985*	0.975***	0.976***	0.975***	0.977***
Child regular bedtime						
Never						
Sometimes					0.888	
Usually					1.007	
Always					0.851	
Discipline (wave 3)					0.982	
Maternal longstanding illness						
No						
Yes					1.075	
Child birthweight						
>2.5kg						
≤2.5kg						1.811*
Child gestational age						
≥37 weeks						
<37 weeks						0.746
Child longstanding illness						
No						
Yes						1.490**
Breastfeeding duration						
No breastfeeding						
Less than 7 days						1.220
1 week to 3 months						1.011
3 months to 6 months						1.247
Above 6 months						1.365
Drink during pregnancy						
Never						
Under once a month						0.969
1-2 times a month						0.906
1-2 times a week						0.934
3-4 times a week						1.487
5-6 times a week						1.725
Every day						2.114
Smoke during pregnancy						
Never smoked						
Stopped during pregnancy						1.544**
Smoked through pregnancy						0.833
N	2,094	2,094	2,094	2,094	2,094	2,094

*** < 0.001 ** < 0.01 * < 0.05

Note: ORs are the odds that the child professes an intrinsic aspiration over an extrinsic one.

Since all cases when a child expresses a 'neutral' aspiration were omitted, the resulting sample size for the above regression results was 2,094. Since parental involvement is reverse coded, model 1's baseline specification shows that less paternal involvement is associated with an increased odds of a child professing an intrinsic aspiration while less maternal involvement is associated with increased odds of a child professing an extrinsic aspiration. Maternal involvement was also more significant than paternal involvement across

all the specifications used. The odds ratios for paternal and maternal involvement were also generally not sensitive to the groups of variables used across the 6 models, remaining nearly constant across the models except for when demographic variables were controlled for in model 2. Model 2's statistically significant β_0 shows that demographic variables are the most important when it comes to predicting the odds of intrinsic/extrinsic goals of occupational aspirations. No other model has a β_0 value which has a statistically significant result.

A number of other variables were powerful predictors of the odds of a child expressing an intrinsic or extrinsic occupational aspiration. Compared to female children, the OR of 0.12 meant male children have much lowered odds of professing a intrinsic occupational aspiration, consistent with the earlier findings in the cross-tabulation of table 6.5. Paternal, but not maternal, unemployment was associated with a larger odds of a child professing an intrinsic aspiration, and the presence of child longstanding illness was also associated with increased propensity towards intrinsic occupational aspiration goals.

6.2.5 Sensitivity Analysis With Specification Curves

The purpose behind the sensitivity analysis was to explore the effects of changing the form of the variables (e.g. using the 6, 8, or 11-category variable for child ethnicity) as well as different combinations of control variables (e.g. adding in and removing maternal involvement, child sex, age, and ethnicity etc.) used on the size of the odds ratio (OR) of **paternal involvement**. Given that most of the models showed a paternal involvement OR which was unchanging, this analysis examines whether iterating over most reasonable combinations of control variables shows an OR that is subject to magnitude fluctuations.

Some combinations of variables were not fully used, for example, child age, sex, and number of siblings were used in conjunction with each other or not

at all (even if the form of the sibling variable changed). Family income, maternal, and paternal employment were always used together or not at all, and so were breastfeeding duration, maternal smoking, and drinking during pregnancy. This was done for two reasons: first, that some of these variables were only theoretically coherent when used together, and secondly that multivariate logistic regressions take significantly more computing power compared to multivariate OLS models in R. A total of 6,912 models were produced, and the respective OR for paternal involvement are represented in figures 6.4 and 6.5.

For both the regressions of masculinity and femininity as well as intrinsic and extrinsic occupational aspirations, the coefficient for paternal employment stayed relatively constant throughout the different models used in their respective regressions. However, the sensitivity analysis with specification curves found that it was sensitive to changes in the controls used.

The range of values that the OR of paternal involvement takes is 0.996 to 1.013 when predicting the odds of a child aspiring to masculine or feminine occupations. The value of the original OR in table 6.4 was 1.009, and this specification curve shows that the 1.009 value is on the high end of the spectrum. There are many specifications which can produce an OR of 1 and even some which can result in an OR of less than 1. The range of the ORs also breaks at two points, jumping from OR = 1.003 to 1.005, and OR = 1.008 to 1.009 at different points. This means there are no specifications which can produce an OR of 1.004, for example. It is not possible to identify exactly the cause of these breaks, but this analysis can conclude that the OR for paternal involvement is sensitive to the controls used. It is possible give findings that suggest paternal involvement is associated with both a propensity for masculine or feminine aspirations. Lastly, most of the confidence intervals for the 6,912 models overlap with the OR = 1 line, casting further doubt to the validity of the findings for the association between paternal involvement and the masculinity and femininity of a child's professed occupational aspiration.

Figure 6.4: Specification Curve for Masculine/Feminine Aspiration

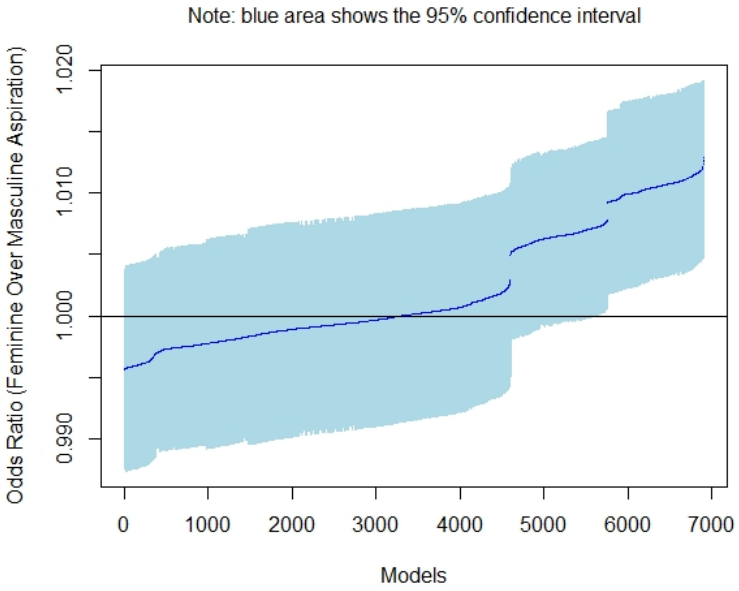


Figure 6.5: Specification Curve for Intrinsic/Extrinsic Aspiration

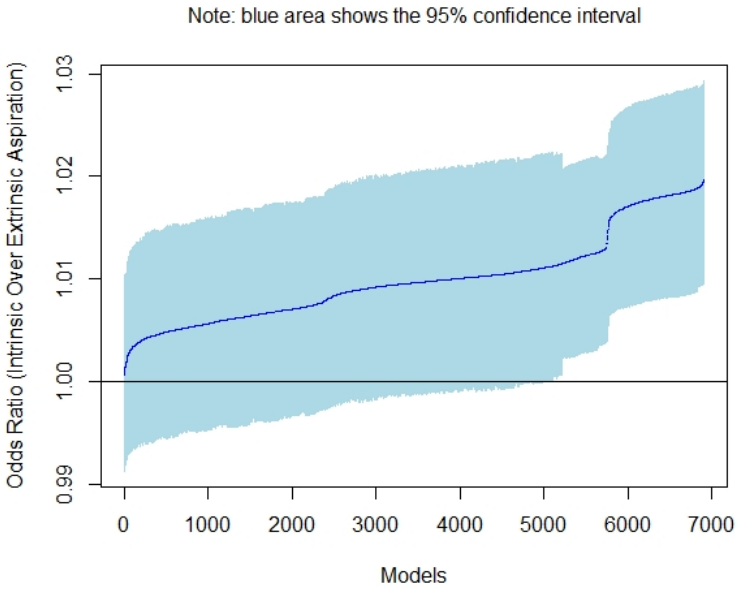


Figure 6.5 shows the range of values that the ORs can take for the association between paternal involvement and a child professing intrinsic or extrinsic occupational aspirations. The range of values for the OR was 1.001 to 1.020, with a jump from OR = 1.013 seeing values quickly rise. While this also shows that the values are highly sensitive at that point, this break is not as sudden as for the previous figure 6.4. All of the ORs for paternal involvement on a child's intrinsic or extrinsic occupational aspiration are above OR = 1, which strengthens the earlier finding that a reduced amount of paternal involvement was associated with an increased odds of a child stating an intrinsic occupational aspiration over an extrinsic one. The OR of 1.016 to 1.018 which was earlier presented were on the very highest end of the specification curve, suggesting that the original values were highly sensitive to the inclusion of controls. A hypothesis which has not been tested is that this sensitivity due to the inclusion or exclusion of demographic variables, especially the sex of the child.

7 | Discussion

Much of the previous discussion on the influence that parents have on their children had always tended to revolve around the role of mothers in their tendency be their child's primary caregivers. Much of the discussion in this area, for example, has long focused on the impact of a woman's earnings upon childbirth, the intermingling of motherhood and employment, and on maternity (but only recently, paternity) leave. Fathers, as this analysis has demonstrated, also play an important part in the raising of children and it is important to consider both parents when considering how best to improve child outcomes. When fathers are more involved with their children, so too are their mothers (and vice versa), and their children benefit more as a result.

Parental Involvement

Different variables predict the degree of involvement by British fathers and mothers on bonding activities they do with their children. Fathers seemed to be influenced most by economic factors, where a higher household income was associated with them putting in greater levels of involvement. Household income did not seem to associate with the degree of involvement that mothers displayed. Unemployment was also positively associated with higher degrees of parental involvement for both fathers and mothers, though the strength of the association was greater for fathers compared to mothers. This finding on the part of fathers differ from traditional perspectives on the gendered division of domestic labour, in particular Brines (1994) finding that husbands who were unemployed continued to do less housework than their wives (Brines, 1994). This is because bonding activities with children is qualitatively different from other more menial forms of domestic labour which is seen not as a clear disutility but can be something parents derive pleasure from. In this case, it may be that parents who are unemployed simply have more time on their hands and therefore spend some of it on bonding activities with their children.

Taking a more macro-oriented perspective, parental involvement also follows a demographic gradient. In particular, parents seem to be far more involved in bonding activities with their children if they are of the same sex as their parent. Fathers are more involved with sons, and mothers with their daughters. The association between fathers and sons is stronger than that for mothers and their daughters. This shows a strong gendered dimension to the division of child involvement. An ethnic dimension exists as well, whereby non-white children seem to receive far less involvement from their parents compared to white children. Children of South Asian and Black Caribbean descent seem to be the most affected, with the sharpest decrease in associated levels of parental involvement. This is true even after controlling for economic factors, other demographic factors, and other lived environmental factors. This analysis thus hypothesises that cultural expectations and norms play a key role in this, both at the individual family and at the level of the wider societies that these non-white families live in. For example, there may be expectations in some non-Western norms embodied by these ethnic minority parents of parents not expressing affection freely and directly, such as the infamous 'Tiger Parenting' style of some East Asian parents (Kim, Wang, Orozco-Lapray, Shen, & Murtuza, 2013). Also, families living in a more deprived area with higher crime, and fewer amenities and shops might reduce the frequency of parents playing with their children outside or taking them to the playground or park. While family income was controlled for in the models, the degree of deprivation in their local area was not.

Child Socio-emotional Difficulties

Parental involvement in bonding activities with their children seems to influence two different types of child outcomes. The first is that of the child's socio-emotional difficulties, which falls within the subset of child psychological health but is distinct from clinically diagnosable mental health conditions. It is a far more general metric designed to measure, to state colloquially, how 'well-adjusted' or 'well-socialised' a child is when they interact with others.

This study used this measure when a child is aged 14, being the most recent data available at time of analysing. Current literature suggests that parental attachment to their children in the early years of childhood (from age 5 to 7) has profound impacts on their outcomes in later childhood and in their teenage years as well. There is relatively little in the way of past research to guide this current analysis, but the expectation is that greater levels of parental involvement should manifest lower socio-emotional difficulties on average. What was originally less certain is whether paternal or maternal involvement was differently associated to this outcome.

This study demonstrated that increased parental involvement with their children at age 5 and 7 was positively associated to lowered socio-emotional difficulties. The specific types of socio-emotional difficulties (this study uses the four measures of total, externalising, internalising, and prosocial difficulties) were associated differently with paternal and maternal difficulties. Externalising difficulties, comprising hyperactivity and conduct problems, were associated with maternal involvement but not paternal involvement. The more the mother was involved with her child, the lower the amount of externalising difficulties the child had. Internalising difficulties, comprising emotional and peer-related problems, was instead associated with paternal involvement but not maternal involvement. The greater the degree of involvement the father had with his child, the fewer internalising difficulties the child tended to display. Mothers seem to be able to mitigate their child's outward-facing behavioural problems while fathers seemed to be able to do so for inward-facing emotional and socialising-related problems. The measure of prosocial difficulty (based on questions of how helpful, kind, willing to share the child is) behaved similarly to externalising and internalising difficulties. This analysis found that the higher the degree of maternal involvement with her child, the lower the child's prosocial difficulties. Over the four different difficulty scores, more parental involvement is therefore helpful in lowering the level of socio-emotional difficulties their children have. Different socio-emotional difficulty scores, however, are associated with the involvement from differ-

ent parents, showing that fathers and mothers have qualitatively different impacts on the behaviours of their children.

Child Occupational Aspiration

The second main outcome this study found to be associated with parental involvement was child occupational or vocational aspirations. While not as concrete an outcome as other health, education, or economic outcomes, aspiration at age 7 is important in projecting the future labour market and life outcomes these children will have. As Paul Willis' Learning to Labour in 1981 finds, one of the factors behind the variation in labour market outcomes for children comes in the form of their beliefs and expectations about what roles they ought to have upon completing education (Willis, 1981). Aspirations are one key aspect of this, and children who do not aspire to greater goals rarely end up achieving them. The formation of a child's occupational aspiration starts very early on in a child's life even at age 7 before they enter school, and is therefore most influenced by their parental upbringing as they would not yet have been socialised within the wider educational system yet.

Three aspects of child occupational aspiration have been analysed in this study: the socio-economic class, the masculinity or femininity, and the extrinsic or intrinsic nature of the occupation. The findings for the analysis of the socio-economic class of a child's professed occupational aspiration seems to indicate that it is generally unassociated to parental involvement. The different degrees of involvement by both parents seem unable to influence the proportion of children professing different classes of occupations. While a lack of parental involvement seemed to increase the odds of a child choosing a 'lower' status occupational aspiration, high levels of parental involvement did not seem to associate with a child choosing a 'higher' status occupational aspiration. It may be that at age 7, children are still too young to fully grasp the significance of social class when stating their occupational aspiration and thus do not explicitly consider it yet. This overall null result supports Gottfredson's finding that children only consider the 'social valu-

ation' of an occupation once they are well into a school-going age of 9 and above (Gottfredson, 1981).

What is more noteworthy in this analysis is the children's profession of intrinsic and extrinsic goals, or whether they value helping others over goals like financial success, image, or popularity. Intrinsic occupations are things like nurse, doctor, teacher, or vet, while extrinsic occupations may be things like actor, singer, supermodel, or billionaire. The findings show mixed results by gender. For girls, there was generally little association between aspirational goals and parental involvement. The differences for boys were more stark. Boys who had less parental involvement by both parents tended to state intrinsic occupational aspirations and shied away from extrinsic ones. Boys with high levels of involvement by both parents tended to select extrinsic aspirations, which this analysis hypothesises representing higher levels of self-confidence and a more positive outlook. The multivariate logistic regression presents additional findings, showing that demographic factors are actually the most powerful predictors of whether a child chooses an intrinsic or extrinsic occupational aspiration. The sex of the child is the single most powerful predictor, with boys decidedly choosing extrinsic aspirations and girls choosing intrinsic ones instead. However, even when sex is controlled for, maternal involvement still seems to be impactful, with greater maternal involvement being associated with an increased odds of a child professing an extrinsic aspiration. Mothers, therefore, seem to be important in their inspiring a level of self-confidence and encouraging a child to have lofty (if materialistic) goals. The association between father involvement and a propensity for child intrinsic aspirations disappears once sex is controlled for.

Lastly, whether children choose masculine or feminine jobs is an interesting one because it examines one way in which gender norms can be reproduced. The sexed nature of an occupation is not determined by cultural norms or societal expectations, but is simply constructed based on the proportion of

men and women working in them. A profession with more than 50% men is considered masculine and vice versa. Existing research suggests that occupational aspirations are definitively sexed, with boys tending to choose male occupations and girls tending to choose female occupations instead. Here, as predicted, boys to a large degree aspire to occupations which are masculine and girls, feminine. Low levels of involvement by both parents seems to associate with the child choosing aspirations which align with the opposite sex. Regardless, the single most powerful predictor of the sex of a child's professed occupational aspiration is still the sex of the child. Once the child sex is factored in, the association between paternal and maternal involvement disappears in both magnitude and significance.

8 | Conclusion and Limitations

This study has produced several findings. The degree of involvement that UK fathers and mothers have in performing bonding activities with their child is unequally distributed, with mothers on average doing more than fathers. This analysis uses data from two-parent families with both husbands and wives being present in the household. The extent of paternal involvement is positively predicted by family income, paternal unemployment, while maternal involvement is positively predicted strongly by factors like the mother's educational qualification but negatively so by being of a non-white ethnicity. Parents were more involved in the care of their children if their child was of the same sex as themselves; fathers with sons, and mothers with daughters.

This is associated with child outcomes of socio-emotional behaviour and occupational aspiration. An increased amount of involvement by parents was associated with fewer socio-emotional difficulties. Increased paternal involvement was associated with a reduction in internalising difficulties while increased maternal involvement was associated with a reduction in externalising difficulties and prosocial difficulties. As for occupational aspiration, increased parental involvement was associated with a propensity towards extrinsic occupational goals. Paternal involvement was not significant once child sex was controlled for, while greater maternal involvement continued to be associated with child proclivities towards intrinsic aspirational goals. The masculinity and femininity of a child's professed occupational aspiration was most powerfully predicted by the sex of the child, with children tending to match their own sex when choosing an occupation. Low levels of parental involvement was associated with children shying away from occupations linked to their own sex. Lastly, parental involvement was found to be unassociated with the socio-economic classification of a child's professed occupational aspiration. On a whole, parents therefore play key roles in their children as they grow up, and parents who spend more time being involved in the lives of their children can expect to see long-term impacts.

There are some limitations of this study. Firstly, the asymmetric availability of information in MCS about the father and mother resulted in more of the variables associated with the mother being used. For example, no information was readily available for the highest paternal level of education. Most of the information pertaining to the whole family like household income or regularity of the child's bedtime was also answered only by the mother. This may diminish the size of the associations for maternal involvement and the various child outcome measures as more mother-related variables could be controlled for and could be one source of bias in the resulting findings.

Secondly, the measure of child socio-emotional difficulties was done via administering the Strengths and Difficulties Questionnaire (SDQ). While this is a well-validated tool, child socio-emotional difficulty was a parent-reported measure largely done by the primary caregiver which is usually the mother. This means that factors such as maternal depression or distress could have biased the results. While this had been controlled for, there may be other sources of bias such as a poor relationship between the mother and child negatively biasing it.

Another limitation is that in only using information from one birth cohort, this study does not attempt to make a claim about whether the descriptions and associations found relating to parental involvement are age, period, or cohort effects. No comparison with other cohorts were made, and this is one area where a future extension is possible. Lastly, because this study used an initial sample of household with husbands and wives both present, this study cannot make any claim about families with absent parents or about families with non-traditional family structures. Twins, triplets, and children of higher order births were also excluded from this study.

A final limitation of the study was its use of the parent-reported SDQ to measure child socio-emotional difficulty. Within the MCS data, there was a teacher-reported SDQ sample which could also have been used (even though the sample size for that is significantly smaller). For future waves of the sur-

vey, there is also a self-reported SDQ which the by-then adolescent children would be able to fully answer by themselves to produce yet another socio-emotional difficulty score which may be cross-referenced with the parent-reported score. This is one avenue with which socio-emotional measures can be further investigated. More research can be done on this topic to further verify the findings of this study.

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A | Strengths and Difficulties Questionnaire

This is the list of 25 questions asked in the SDQ. Questions ask caregivers (usually the mother) the extent to which their child displays a given behaviour or trait with three possible responses: Not True, Somewhat True, and Certainly True.

The first four categories of items are summed to create the Total Difficulties Score (TDS). Scores in emotional symptoms and peer relationship are added to arrive at an Internalising Difficulties score. Hyperactivity and conduct problems are summed to give an Externalising Difficulties score. Prosocial behaviours are used as its own separate category. Italicised items are reverse scored when summing.

Hyperactivity

- Restless, overactive, cannot stay still for long
- Constantly fidgeting or squirming
- *Thinks things out before acting*
- *Sees tasks through to the end, good attention span*
- Easily distracted, concentration wanders

Conduct problems

- Often has temper tantrums or hot tempers
- *Generally obedient, does what adults request*
- Often fights with other children or bullies them
- Can be spiteful to others
- Often argumentative with adults

Emotional symptoms

- Often complains of headaches, stomach aches, or sickness

- Many worries, often seems worried
- Often unhappy, down-hearted or tearful
- Nervous or clingy in new situations, easily loses confidence
- Many fears, easily scared

Peer relationships

- Rather solitary, tends to play alone
- *Has at least one good friend*
- *Generally liked by other children*
- Picked on or bullied by other children
- Gets on better with adults than with other children

Prosocial behaviour (not included in TDS score)

- Considerate of other people's feelings
- Shares readily with other children (treats, toys, pencils, etc.)
- Helpful if someone is hurt, upset or feeling ill
- Kind to younger children
- Often volunteers to help others (parents, teachers, other children)