Research Article

Maternal employment and the well-being of children living with a lone mother in Scotland

Francesca Fiori

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Abstract

BACKGROUND
Previous research has shown that children who do not live with both of their parents fare worse on a variety of outcomes. However, less is known about the heterogeneity of children's socioeconomic context and the factors that contribute to the negative effect of family structure.

OBJECTIVE
This study examines whether, under which circumstances, and through which mechanisms maternal employment influences the socioemotional well-being of children living with a lone mother in Scotland.

METHODS
The study uses longitudinal data from Growing Up in Scotland to follow a sub-sample of children living with lone mothers (N = 918). It applies Inverse Probability Weighting to estimate the effect of maternal employment when the child is aged 3 on children's socioemotional well-being at age 5, net of selection effects; and the KHB decomposition method to assess the mediating role of household income and maternal well-being.

RESULTS
Children of working lone mothers are less at risk of having severe socioemotional problems, particularly if their mothers work in medium–high occupational positions. Higher levels of household income and the greater psychological well-being of working mothers partly explain the positive effect of maternal employment.

CONTRIBUTION
This study enhances understanding of the factors associated with the socioemotional well-being of children living with a lone mother by providing a detailed analysis of the role of maternal employment.

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1. Introduction

Families play an important role in shaping children's early circumstances (Bronfenbrenner and Morris 2006), and the experiences of socioeconomic advantage or disadvantage during early childhood can influence subsequent health and social outcomes over the life course (Dafenner 2003). Developmental theories (see Shonkoff and Phillips 2000 for an exhaustive discussion) emphasise the role of nurturing relationships and family resources as two of the primary mechanisms through which families contribute to influencing child development and well-being. Nurturing relationships between parents and child provide warmth, emotional closeness, and supervision, and contribute to the child's feelings of security, confidence, and trust (Collins et al. 2000; Maccoby 2000). Resources define a family's capacity to respond to basic human needs (such as food, housing, and clothes) and to provide opportunities that cultivate children's cognitive and social development (Becker 1981; Brooks-Gunn and Duncan 1997). Parents' abilities to provide nurturing relationships and economic resources are often interrelated. As posited by the family stress model, economic resources are important to enable optimal parent–child relationships, whereas the experience of economic hardship is associated with parental depression and stress, which in turn may undermine the quality of the parent–child interaction (Elder and Caspi 1988; McLoyd 1990).

Economic resources and parental behaviour can account for differences in child well-being across different families (Thomson, Hanson, and McLanahan 1994; Thomson and McLanahan 2012). Family structure, in particular, acts as an important marker of socioeconomic advantage or disadvantage, and as a mechanism for the reproduction of inequality (McLanahan 2004; McLanahan and Percheski 2008). Much of the scientific concern focuses on lone-parent families, due to their distinctive configuration of resources and parent–child relationship. Lone-parent families have much lower income than two-parent families, as the resident parent (often the mother) face competing caregiving demands (work and family) while the non-resident parent (usually the father) contributes less to the economic maintenance of the children. Children in lone-parent families are also exposed to more limited parental time and parenting input. First, non-resident parents are often less involved in parenting; second, the time constraints and economic pressures resident parents face may affect their ability to supervise and participate in their children's lives, and the quality of their parenting style (Amato 2001, 2010; McLanahan and Sandefur 1994; Seltzer 2000). This relative scarcity of resources can make it more difficult for children to reach positive life outcomes. Empirical evidence has consistently shown that children who do not live with both parents fare worse on a variety of outcomes, such as health and well-being, education, and labour market attainment; and they often differ in terms of their own family lives in adulthood (for a

thorough review see Amato and Keith 1991; Amato 2001, 2010; Chapple 2013; McLanahan, Tach, and Schneider 2013; Härkönen, Bernardi, and Boertien 2018).

Children can experience life with a lone parent at different stages of their life course and for different durations. Some children are born to lone mothers and continue living with only them for most of their lives; others experience parental separation at different ages; and some go through multiple family transitions. Drawing on the wealth of longitudinal data now available, scholars have increasingly turned their attention to the complexity of life-course family trajectories and their effect on child outcomes (see, for instance, Mariani, Özcan, and Goisis 2017 and Jackson, Kiernan, and McLanahan 2017 for two recent studies of changing family circumstances and child outcomes in the United Kingdom). Furthermore, what happens on average to children living with lone parents at a given point in life might still be concealing large variation within this group. Echoing earlier recommendations (McLanahan and Sandefur 1994; Thomson and McLanahan 2012), and setting the stage for future research, a recent article by Härkönen, Bernardi, and Boertien (2018) has encouraged scholars to focus on differences (such as by ethnicity or by socioeconomic status) in the effect of family structure to better understand children's vulnerability and resilience regarding family change.

This study responds to the call for more nuanced analyses of the effect of family structure on child outcomes. It limits its attention to children who were living with a lone mother when they were aged 3, and although the focus is not explicitly on the diversity of their family trajectories, it accounts for mothers' partnership histories. Most importantly, the study enhances the understanding of the heterogeneity of lone-mother families by regarding maternal employment as a differentiating element in children's levels of socioemotional well-being. Maternal employment can play a powerful role in determining the time and money that lone parent families devote to their children. Mothers who work can have access to greater economic resources than those who rely solely on welfare and/or child maintenance. At the same time, however, the time they spend in the labour market may decrease the quantity and quality of mother–child interactions. The study also recognizes that not all types of employment act in the same way, and seeks to shed light on some of the mechanisms through which maternal employment operates on children's well-being.

The empirical analyses are based on a large and nationally representative longitudinal study of children's lives and focus on Scotland which, in line with the rest of United Kingdom, has one of the highest rates of lone-parent families in Europe (Bernardi and Mortelmans 2018; Harkness and Salgado 2018; Treanor 2018). In the 2011 census there were 263,000 lone parent families in Scotland (11% of all households). Around two-thirds (170,000) included dependent children, of whom the majority were living with a lone mother. These proportions were similar to those in the previous census. Among lone parents with dependent children, 58% were in employment. Both the

proportion of lone parents in employment and the hours worked by those in employment increased between 2001 and 2011 (National Records of Scotland 2013). This was largely a consequence of UK-wide policies promoting the labour market participation of lone parents. In 1998 the New Deal for Lone Parents provided information, training, and support for lone parents with school-aged children who wanted to work or to increase their current working hours, moving away from the assumption that lone parents will stay at home to care for their children. Lone parents, however, were not required to seek and accept work (Millar 2000). A decade later, following changes to Parents' Obligations, non-working lone parents gradually lost their entitlement to Income Support and were required to comply with full job-seeking requirements – initially when their youngest child turned 16, then anticipating progressively to the child's third birthday. More recent welfare reforms – such as replacing many previously existing welfare benefits with Universal Credit – have introduced "in-work conditionality", and a system of sanctions if individuals do not comply with mandatory work-related requirements (Bennett 2012).

However, the policy emphasis on getting lone parents into work has only been connected loosely to measures to support their care responsibilities. All working parents are entitled to tax-free childcare, but hourly childcare costs are disproportionately high and the provision of pre-school places is inadequate (Harding, Wheaton, and Butler 2017). Mirroring similar measures in the rest of United Kingdom, the Standards in Scotland's Schools etc. Act 2000 established the right to more than 400 hours per year of free early learning and childcare for every pre-school child. This statutory entitlement has been gradually expanded to 600 hours per year and extended to 2 year olds with a parent in receipt of qualifying benefits. Recently, the Scottish Government has pledged to further increase the funding to 1,140 hours by 2020, thus aiming to cover the cost of 30 hours per week during term-time.

In this changing policy landscape, the study of the effects that maternal employment can exert on the socioemotional well-being of children living with a lone mother acquires societal as well as scientific relevance.

2. Employment and child well-being in lone-mother families

A growing body of research focuses on the relationship between maternal employment and children's life outcomes. The relationship is equivocal (Heinrich 2014): On the one hand, maternal employment can positively impact children, as working mothers earn (additional) money that they can use to improve their living conditions in many ways, such as by providing better nutrition, healthcare, childcare, and learning opportunities. Working parents can also act as positive role models for their children, instilling independence, self-sufficiency, and career aspirations. On the other hand, maternal

employment reduces the time mothers can spend with their children, particularly if they work long hours or evening shifts. Further, work-related stress can spill over into mothers' family lives, affecting their parenting skills and compromising the serenity of the home environment. Empirical evidence (see Lucas-Thompson, Goldberg, and Prause (2010) and Heinrich (2014) for an exhaustive review) supports both positive and negative pathways, and highlights the importance of accounting for a range of moderating factors to identify under which conditions, and for which sub-groups, early maternal employment is associated with positive or negative outcomes.

A number of studies suggest that employment has no negative effects for the children of lone mothers and may actually be beneficial (Harvey 1999; Han, Waldfogel, and Brooks-Gunn 2001; Brooks-Gunn, Han, and Waldfogel 2002; Ruhm 2004). Indeed, both Lucas-Thompson, Goldberg, and Prause (2010) and Heinrich's (2014) literature reviews recognize family structure as an important moderator of the association between maternal employment and child outcomes and conclude that in lone parent families (as in other low-income families) the positive effect of greater economic resources tends to outweigh the negative effects of more limited parental availability. Improvements in family income are perhaps the most plausible mechanism through which maternal employment affects family well-being, directly through the availability of greater resources to fulfil family members' needs, and indirectly by alleviating the psychological stress of mothers trying to provide for their children (McLoyd 1990). Working lone mothers also benefit from daily routines and meaningful experiences outside the home, from social companionship and informational resources, and from a gained sense of self-sufficiency. In turn, their greater emotional and psychological well-being enhances parenting quality and the warmth of mother–child interactions (Downey and Coyne 1990; Raver 2003).

There are, however, some caveats to the positive association between lone mothers' employment and children's outcomes. First, the well-being of lone mothers and their children is particularly reliant on good quality jobs that provide at least a living wage, and a good family–work balance (Perry-Jenkins and Gillman 2000; Kalil and Ziol-Guest 2005; Strazdins et al. 2010). Although all working mothers face similar types of problems, levels of family–work conflict tend to be higher for lone mothers, in particular for those who work longer hours or have non-standard working schedules (Albelda, Himmelweit, and Humphries 2004; Bianchi and Milkie 2010; Minnotte 2012). This is linked to the availability of affordable, high-quality, formal childcare, which is critical if employment is to have a positive impact on children (Heinrich 2014; Brady and Cook 2015). Not only does formal childcare allow more mothers to work, but there is also a strong consensus that it enhances children's cognitive and socioemotional development by providing structured activity and social interactions under the care and with the support of trained staff. Further, exposure to early learning and childcare settings has

been shown to be particularly beneficial for the life chances of children from more disadvantaged backgrounds (Burger 2010; Nores and Barnett 2010). However, parental decisions about formal childcare are constrained by the availability and costs of services (Kulik et al. 2019) and lone mothers often have to rely on informal care provided by family and friends. Social relationships are key to ensuring employment sustainability for many lone mothers (Millar and Ridge 2009), as family and friends provide free transport, food, and childcare that help them combine work and care (Cook 2012). Extended and multigenerational family bonds are also crucial for the well-being of individuals in lone-parent families. Grandparents in particular can influence the development and well-being of their grandchildren by providing practical and emotional support to both them and their parents (Ruiz and Silverstein 2007; Attar-Schwartz et al. 2009; Jappens and Van Bavel 2019). At the same time, lone mothers' reliance on childcare support from families is more vulnerable to changes in circumstances (such as grandparents' illnesses), with implications for their ability to sustain employment (Scott, London, and Hurst 2005; Millar and Ridge 2009; Brady 2018). Further, informal care provided by relatives has been shown to be less beneficial for the outcomes of children from more disadvantaged backgrounds than formal centre-based care (Gregg et al. 2005; Bernal and Keane 2011; Del Boca, Piazzalunga, and Pronzato 2014).

The majority of the research on lone mothers' employment focuses on American households, motivated by the need to assess the effect of welfare-to-work programmes. In the British context, comparatively little attention has been paid to the impact of lone mothers' labour market participation on their children's life outcomes. Nevertheless, the limited evidence that exists supports a positive relationship between maternal employment and the outcomes of children growing up with lone mothers (Kiernan 1996; Law et al. 2014). Research focusing explicitly on Scotland shows that the lower well-being of children in lone-parent families is associated with higher levels of material deprivation, which might be caused by their parents' low work intensity and high job instability (Treanor 2018). None of these British studies focus solely on children living with lone mothers; nor do they analyse in detail how different features of maternal employment might impact on child well-being, or the mechanisms that might contribute to explain this relationship. The only study to concentrate on children of lone parents (Taulbut et al. 2016) shows not only that there are differences between the well-being of children of working and non-working lone parents in Scotland, but also an income-related gradient and a plausible association with the mothers' well-being. However, the study relies on cross-sectional data and is therefore descriptive in nature.

The present study seeks to advance knowledge on whether, for whom, and how maternal employment impacts the well-being of children living with a lone mother by using longitudinal data on two cohorts of children born in Scotland. It focuses exclusively on children living with a lone mother at age 3, and it exploits the wealth of information

on their mothers' employment status, type of occupation, and working schedule to conduct a fine analysis of the effect of type of employment. Furthermore, it takes advantage of the longitudinal design of the data to control for baseline characteristics that simultaneously affect maternal employment and child well-being, and to explore possible mechanisms through which maternal employment shapes child well-being.

The focus is on early childhood (i.e., from birth to the time preceding the transition to primary school), during which the family context (notably the parents) primarily shapes and influences children's rapid physical, cognitive, and socioemotional development. Once children are older, other extra-familial contexts – such as the school or the peer group – tend to gain in relevance (Shonkoff and Phillips 2000; Bronfenbrenner and Morris 2006). Developmental theories suggest that early maternal employment can disrupt the secure attachment between mother and child, with negative implications for child development and emotional well-being (see, for instance, Shonkoff and Phillips 2000; Belsky 2006). Research evidence consistently supports this view and indicates that maternal employment in the child's first year can indeed be harmful for children (Baydar and Brooks-Gunn 1991; Waldfogel, Han, and Brooks-Gunn 2002; Ruhm 2004; Hill et al. 2005), especially if mothers work long hours (Brooks-Gunn, Han, and Waldfogel 2010; Ruhm 2004; Gregg et al. 2005). On the other hand, work in the second, third, or fourth year of life seems beneficial for cognitive and/or behavioural development (Baydar and Brooks-Gunn 1991; Waldfogel, Han, and Brooks-Gunn 2002; Hill et al. 2005). Studies on the effects of maternal employment during middle childhood and adolescence are less conclusive. However, outcomes at these later ages might still be vulnerable to earlier influences, as suggested by notions of critical/sensitive periods in human development (e.g., Shonkoff and Phillips 2000) and sociological theories of cumulative advantage and disadvantage (e.g., Dannefer 2003).

From a policy perspective, the focus on early childhood is critical to provide up to date and robust evidence on whether, and in which circumstances, newly introduced measures in the Scottish context to support maternal employment, and in particular to promote the employment of lone mothers with young children, can help or hurt their children.

Building on the theoretical framework that regards maternal employment as a potential element of differentiation in the resources available to children living with a lone mother, this study addresses the following research questions:

1) Is maternal employment beneficial to the socioemotional well-being of children living with a lone mother?
2) Does the relationship between maternal employment and child well-being vary – in sign and and/or strength – depending on the mother's: (a) number of hours worked, or (b) occupational status?

3) To what extent is the relationship between maternal employment and children's well-being mediated by: (a) household income; (b) maternal psychological well-being?
4) How does reliance on formal or informal childcare affect the relationship between maternal employment and child well-being?

3. Data and methods

3.1 Data

The analyses use data from Growing Up in Scotland, a longitudinal study that follows the lives of three cohorts of children born in Scotland during the 2000s and collects a wide range of sociodemographic information on them and their parents. To boost sample size, I combine data from Birth Cohort 1 (children born in 2004–2005) and Birth Cohort 2 (children born in 2010–2011). Children might experience life with a lone parent at different times in life and for different durations. I observe them at the age of 10 months, 3 years, and 5 years. Around a quarter of the 11,344 children originally surveyed in Sweep 1 are living with a lone mother during at least one of the 3 sweeps under observation. Some are born to lone mothers, some experience their parents' break-up, and others go through more complex trajectories, including living with a step-parent. For the purpose of this study I limit my attention to 1,041 children living with a lone mother (i.e., without their biological father and/or their mother's other partner) at age 3 and whose mothers were interviewed at all 3 sweeps. I further exclude 118 children who were coresiding with at least one grandparent at age 3, and 5 children with missing information on the key variables of the analysis. The final sample thus consists of 918 children.

3.2 Measures

The outcome of interest is children's socioemotional well-being at age 5. It is measured by the Strengths and Difficulties Questionnaire (Goodman 1997, 1999), a tool widely used to assess the well-being of children aged 4 to 17. The questionnaire consists of 25 items, 5 per each of the following sub-dimensions: conduct problems, emotional symptoms, hyperactivity, peer relationships, and pro-social behaviour. All items are rated on a three-point Likert scale (not true, somewhat true, and certainly true). I use the Total Difficulties Score, which sums together the emotional, peer, conduct, and hyperactivity subscales, and is considered a valid measure of overall child mental health problems (Goodman 1997, 1999; Goodman et al. 2000; Goodman and Goodman 2009). The score

ranges from 0 to 40, with higher values indicating greater rates of socioemotional disorders. In particular, children with scores above 17 are classified as having severe mental health problems (Meltzer et al. 2000; Green et al. 2005). The empirical analyses presented here focus on this particularly vulnerable group and use a dichotomous variable that takes value 1 when the score is equal to or greater than the cut-off point. In the selected sub-sample of children living with a lone mother at age 3, the prevalence of severe mental health problems is 12.4%, much higher than the 5.8% observed for the total sample, thus confirming for Scotland what is known from the literature; i.e., that children growing up without their fathers fare worse in terms of their socioemotional well-being. Alternative specifications of the models use a lower threshold (SDQ ≥ 14, including also children with "slightly raised" socioemotional problems), and SDQ scores as a continuous variable. Findings from these robustness checks are also briefly commented on in the results section.

The objective of the study is to assess whether and how maternal employment plays a protective role in children's socioemotional well-being. The core explanatory variables thus relate to the employment status and employment characteristics of the mother, measured when the child is aged 3. A first specification of the model includes a simple dichotomous variable – 'Mother's employment status' – distinguishing whether the child's mother was in employment or not. Two further specifications include separately 'Mother's working hours' and the 'Mother's occupational status'.

In order to address the question of which mechanisms might explain the effect of maternal employment on children's well-being, the models then include a measure of self-reported 'Household's equivalised income'. The role of a greater maternal well-being associated with employment is then assessed through the inclusion in the models of 'Mother's mental health'. Lastly, two distinct dichotomous variables express whether the mother relies on 'Childcare from relatives' and whether she uses 'Formal centre-based childcare'. All variables are measured when the child is aged 3.

All models specifications are adjusted for a number of characteristics that are known to be associated with children's well-being. The analyses thus control for the child's gender and limiting long-term illness, and for the mother's age and educational status. Mother's partnership trajectory and siblings configuration in the first three years of the child's life, as well as non-resident father's level of interest in the child, are included as measures of the child's family context. Further details on the construction of the variables included in the analyses, as well as their percentage distribution, are presented in Appendix 1.

3.3 Methods

The first aim of this study is to estimate the effect of maternal employment and its characteristics on the child's socioemotional well-being. Given that the outcome is a dichotomous variable, I use a logistic regression model with the following formal expression (Agresti 2013):

$$\pi_i = \frac{\exp(\alpha + \beta X_i)}{1 + \exp(\alpha + \beta X_i)}, \tag{1}$$

where π_i is the probability that the child has severe socioemotional problems and X_i is the vector of individual covariates described above.

However, the estimated association between maternal employment and child's well-being would not generally have a causal interpretation if employed and non-employed mothers differ with respect to confounders that also affect children's well-being. I use Inverse Probability Weights (IPW) (Hernán and Robins 2019) to simulate a pseudo-population in which there is no association between confounders measured at baseline and mother's employment status and to reduce the bias due to confounders that might be affecting both maternal employment and child well-being. For example, in our sub-sample of children living with a lone mother, employed mothers are more often highly educated than non-employed mothers, and education is also significantly associated with a child's well-being.

Based on existing literature, I include the following confounders, all measured at baseline (i.e., around the time of childbirth or when the child was aged 10 months). First, in order to minimize bias due to selection out of employment of mothers whose children have health or developmental issues from an earlier age, the models control for whether the child had a low birth weight, a limiting illness, or a disability and for the mother's concerns about the child development, learning, or behaviour when the child was 10 months. These earlier measures are also likely to be correlated with child outcomes later in life. 'Birth order' is also controlled for, as the literature suggests an influence of birth order and sibling size on children's social and emotional skills (e.g., Salmon, Cuthbertson, and Figueredo 2016) and the number of children may affect the mother's ability to combine work and family and to remain employed after childbirth (Waldfogel 1997). Second, the models include a number of maternal characteristics that are known to influence both employment decisions after childbirth and child outcomes. For instance, mother's 'age at childbirth' is associated with child outcomes (Goisis 2015); and women who postpone childbearing tend to have a stronger attachment to employment (Miller 2011). Similarly, higher 'educational levels' and 'prior work experience' reflect women's commitment to paid work and their greater chances of being employed after childbirth (Cigno 1991; Gustaffson et al. 1996); while at the same time they are important markers

of socioeconomic status known to be associated with child development (Feinstein, Duckworth, and Sabates 2008). The 'mother's health' after childbirth might affect her ability to work, and is also believed to play a fundamental role in her children's mental and physical development (e.g., Downey and Coyne 1990). A further variable accounts for mother's 'partnership status' at childbirth, to distinguish those who have never been in a relationship with the child's father. Lastly, the models include a measure of 'grandparents' availability for childcare', given its importance in supporting both maternal employment (Arpino, Pronzato, and Tavares 2014) and child development (Sadruddin et al. 2019).

As a first step, I estimate the mother's probability of being in employment net of the observed confounders using a logistic regression (Table A-3a in Appendix 2). Similarly, I use a multinomial logistic regression to estimate the probability of being in a given working-hours arrangement (Table A-3b in Appendix 2), or in a given occupational status (Table A-3c in Appendix 2).

The estimated probabilities are then used to compute stabilized Inverse Probability Weights (IPW), equal to the ratio of the probability that the child experiences a given maternal employment status and the same probability conditional on the observed confounders at baseline. Children whose baseline characteristics are overrepresented in a given maternal employment status are attributed less weight, whereas children with less frequent characteristics receive a higher weight, so that confounders at baseline become equally distributed between all values of maternal employment status. Thus, by applying stabilized IPW to the children in our sample we simulate a pseudo-population in which there is no association between covariates measured at baseline and mother's employment status (Tables A-4a-c in Appendix 2).

The empirical analyses presented in the next sections are estimated by applying logistic regression models to the weighted pseudo-populations. Because in the pseudo-population, unlike the actual population, the probability of a given maternal employment status is independent from the measured confounders, the association between maternal employment and consequent child well-being should provide a less biased estimate of its effect. However, there remains the problem of unobservable confounders – as in any study based on observational data – so that the interpretation of effects will never be truly causal. Lastly, IPW are multiplied by GUS longitudinal weights (ScotCen 2015, 2018) to also correct for sample attrition until the final survey sweep (Fewell et al. 2004).

A second aim of the study is to understand which mechanisms contribute to explaining the effect of maternal employment on the child's socioemotional well-being. In particular, I am interested in quantifying the role of maternal psychological well-being and household economic conditions. This question requires comparing coefficients across nested models; i.e., before and after the inclusion of each variable whose mediating role I intend to test. However, comparing effects across non-linear probability models is

not as straightforward as in linear models, as the regression coefficients and the error variance are not separately identified. Estimated coefficients in the non-linear probability model are a ratio of the true regression coefficient and a scale parameter, which is a function of the error variance. Because the error variance may differ across models, coefficients cannot be compared directly (Winship and Mare 1984; Mood 2010). To overcome this problem I use the KHB decomposition method (Kohler, Karlson, and Holm 2011; Karlson, Holm, and Breen 2012), which estimates coefficients net of rescaling and allows the decomposition of the total effect into direct and indirect effect. That is, it produces estimates of the total effect of maternal employment on child well-being, and decomposes it into the direct effect of maternal employment net of the mediating variable, and into the indirect effect of maternal employment explained by the mediating variable.

4. Results

This section addresses the research questions by reporting results from different specifications of the logistic regression model estimating the probability that the child suffers severe socioemotional problems at age 5. Results are expressed as Average Marginal Effects; i.e., as the difference in the predicted probability of severe problems for each category of the explanatory variable of interest relative to its reference category, while the other variables are held at their observed values. Results are always adjusted for selection at baseline and for sample attrition through the inclusion of weights, as described above.

4.1 The effect of maternal employment on the child's well-being

The first model (Model 1a, Table 1) includes the simple dichotomous categorization of the mother's employment status when the child was aged 3. The results reveal a positive effect of maternal employment, net of all the other characteristics of the child and of his/her family. Specifically, children living with a working, lone mother are 10.7 percentage points less likely to show severe socioemotional problems at age 5 than children living with a non-working lone mother.

Table 1: **Effects of mother's employment status on the child's probability of severe socioemotional symptoms. Logistic regression model: Average Marginal Effects and significance levels**

	Model 1a			
	AME	**P-value**	**[95% Conf. Interval]**	
Mother's employment status when child was aged 3				
Not in employment (Ref.)				
In employment	−0.107	0.000	−0.165	−0.050
Birth cohort				
2004–2005 (Ref.)				
2010–2011	0.045	0.107	−0.010	0.101
Mother's age at childbirth				
20 and older (Ref.)				
Below 20	−0.007	0.835	−0.076	0.061
Mother's educational level at childbirth				
Low (Ref.)				
Medium	−0.035	0.226	−0.091	0.021
High	0.007	0.908	−0.119	0.134
Child's gender				
Boy (Ref.)				
Girl	−0.052	0.078	−0.110	0.006
Child with limiting long term illness up to age 3				
No limiting long-term illness (Ref.)				
Limiting long-term illness	0.136	0.099	−0.025	0.298
Siblings in the household up to age 3				
No siblings (Ref.)				
Biological siblings only	0.028	0.457	−0.046	0.103
Other sibling configuration	0.045	0.218	−0.027	0.117
Mother's partnership trajectory up to age 3				
Never in a cohabiting relationship (Ref.)				
Child's father moved out	0.061	0.111	−0.014	0.136
More complex trajectories	0.094	0.173	−0.041	0.229
Non-resident father's interest in child – when child was aged 3				
Not very interested/no contacts (Ref.)				
Very interested	−0.083	0.004	−0.139	−0.027

Source: Author's analysis of Growing Up in Scotland.

The results also highlight the importance of some of the characteristics of the child and their family context included in the model. As expected, girls are less likely to have socioemotional problems. Then, net of selection of mothers in employment with healthier

children, children with experience of limiting long-term illness in the first 3 years of their life are more likely to have socioemotional problems. Most importantly, child well-being responds to the level (and quality) of non-resident fathers' involvement. Findings show that children whose fathers are very interested in their lives are 8.3 percentage points less likely to show severe socioemotional symptoms than children whose fathers are less interested or have no contact. Alternative model specifications tested the role of different measures of non-resident fathers' involvement, such as the frequency of contact or the payment of child maintenance. None of these variables were associated with child well-being, suggesting a greater importance of emotional, rather than practical, involvement.

4.2 The characteristics of maternal employment and child's well-being

To address the question of what type of maternal employment has an effect on children's well-being, further specifications of the model include separately two more detailed explanatory variables describing 'Mother's working hours' (Model 1b, Table 2) and 'Mother's occupational status' (Model 1c, Table 2).

Table 2: **Effects of mother's working hours and occupational status on the child's probability of severe socioemotional symptoms. Logistic regression model: Average Marginal Effects and significance levels**

	AME	P-value	[95% Conf. Interval]	
Model 1b*				
Mother's employment status and working hours when child was aged 3				
Not in employment (Ref.)				
In employment: 0–15 hours	−0.102	0.088	−0.218	0.015
In employment: 16–34 hours	−0.108	0.001	−0.172	−0.043
In employment: 35+ hours	−0.141	0.000	−0.204	−0.077
Model 1c*				
Mother's employment and occupational status when child was aged 3				
Not in employment (Ref.)				
In employment: Routine and semi-routine occupations	−0.090	0.010	−0.159	−0.022
In employment: Intermediate occupations	−0.162	0.000	−0.205	−0.118
In employment: Professional and managerial occupations	−0.160	0.000	−0.205	−0.114

Source: Author's analysis of Growing Up in Scotland.
Note: * Adjusted for: Birth cohort, Mother's age, Mother's educational level, Child's gender, Child with limiting long-term illness, Siblings in the household, Mother's partnership trajectory, Non-resident father's interest in child.

Compared to children living with non-working lone mothers, children whose mothers work longer hours have the lowest predicted probability of severe socioemotional problems, followed by children whose mothers work between 16 and 34

hours. The probability of reporting poorer socioemotional well-being also varies across the mother's occupational status, being 16 percentage points lower for children whose mothers are in intermediate or managerial and professional occupations. Even children whose mothers are in lower status occupations are less likely to show socioemotional problems than children of non-working mothers.

Thus, with the sole exception of mothers working very few hours per week (for whom estimates are too imprecise to draw any conclusion), all working-time arrangements and occupational statuses have a positive effect on children's well-being.

4.3 The mediating role of the household's economic conditions

In order to explore whether maternal employment might affect children's well-being through improved economic conditions, I include in the models a variable based on the quintile distribution of the household income (Models 2a-c, Table 3).

Household income is associated with children's well-being. Children in the top three quintiles of the household's income distribution are 8 percentage points less likely to have severe socioemotional problems compared to those in the bottom quintile. The mediation effect of income on maternal employment (Coef = –0.324, p-value = 0.067) reduces the difference between the probability of children of working and non-working mothers having severe symptoms by 2.9 percentage points (from 11.1% to 8.2%). In other words, the inclusion of this variable contributes to explaining over a quarter of the overall positive employment effect on children's well-being. The mediating role of the household income is stronger for children whose mothers work at least 16 hours and in lower-status occupations.

Table 3: **The mediating role of household income on the relationship between mother's employment status and child's probability of severe socioemotional symptoms. Logistic regression model: Direct, Indirect, and Total effects**

		Direct effect			Indirect effect	Total effect	% mediated by household income
	AME	P-value	[95% Conf. Interval]				
			Model 2a*				
Mother's employment status when child was aged 3							
Not in employment (Ref.)							
In employment	−0.082	0.001	−0.148	−0.016	−0.029	−0.111	26.0
Household income when child was aged 3							
Lowest quintile (Ref.)							
2nd quintile	−0.051	0.174	−0.126	0.023			
3–5 quintiles	−0.081	0.038	−0.158	−0.004			
Info not available	−0.002	0.968	−0.102	0.098			
			Model 2b*				
Mother's employment status and working hours when child was aged 3							
Not in employment (Ref.)							
In employment: 0–15 hours	−0.097	0.071	−0.201	0.008	−0.007	−0.103	6.4
In employment: 16–34 hours	−0.081	0.035	−0.156	−0.006	−0.028	−0.109	25.9
In employment: 35+ hours	−0.101	0.024	−0.189	−0.014	−0.038	−0.140	27.5
Household income when child was aged 3							
Lowest quintile (Ref.)							
2nd quintile	−0.054	0.153	−0.128	0.020			
3–5 quintiles	−0.079	0.049	−0.158	−0.000			
Info not available	0.000	0.996	−0.091	0.092			
			Model 2c*				
Mother's employment and occupational status when child was aged 3							
Not in employment (Ref.)							
In employment: Routine and semi-routine occupations	−0.069	0.063	−0.142	−0.004	−0.024	−0.093	25.6
In employment: Intermediate occupations	−0.143	0.000	−0.187	−0.099	−0.020	−0.163	12.2
In employment: Professional and managerial occupations	−0.140	0.000	−0.186	−0.095	−0.020	−0.160	12.3
Household income when child was aged 3							
Lowest quintile (Ref.)							
2nd quintile	−0.057	0.062	−0.117	0.003			
3–5 quintiles	−0.057	0.149	−0.135	0.021			
Info not available	0.003	0.954	−0.084	0.089			

Source: Author's analysis of Growing Up in Scotland.
Note: * Adjusted for: Birth cohort, Mother's age, Mother's educational level, Child's gender, Child with limiting long-term illness, Siblings in the household, Mother's partnership trajectory, Non-resident father's interest in child.

4.4 The mediating role of maternal psychological well-being

Models 3a–c (Table 4) include the variable accounting for maternal psychological health, to explore whether the positive effect of maternal employment operates through an improvement in mothers' well-being.

Table 4: **The mediating role of maternal well-being on the relationship between mother's employment status and the child's probability of severe socioemotional symptoms. Logistic regression model: Direct, Indirect and Total effects**

	Direct effect				Indirect effect	Total effect	% mediated by mother's mental well-being
	AME	P-value	[95% Conf. Interval]				
			Model 3a*				
Mother's employment status when child was aged 3							
Not in employment (Ref.)							
In employment	−0.102	0.000	−0.157	−0.047	−0.012	−0.113	10.3
Mother's mental well-being when child was aged 3							
Common mental disorders (mcs<=50) (Ref.)							
No common mental disorders (mcs>50)	−0.122	0.000	−0.178	−0.067			
			Model 3b*				
Mother's employment status and working hours when child was aged 3							
Not in employment (Ref.)							
In employment: 0–15 hours	−0.117	0.017	−0.214	−0.021	0.009	−0.108	−8.8
In employment: 16–34 hours	−0.100	0.001	−0.161	−0.038	−0.012	−0.112	10.7
In employment: 35+ hours	−0.132	0.000	−0.201	−0.064	−0.014	−0.146	9.3
Mother's mental well-being when child was aged 3							
Common mental disorders (mcs<=50) (Ref.)							
No common mental disorders (mcs>50)	−0.123	0.000	−0.178	−0.067			
			Model 3c*				
Mother's employment and occupational status when child was aged 3							
Not in employment (Ref.)							
In employment: Routine and semi-routine occupations	−0.087	0.010	−0.153	−0.021	−0.011	−0.098	11.3
In employment: Intermediate occupations	−0.159	0.000	−0.201	−0.116	−0.007	−0.165	4.2
In employment: Professional and managerial occupations	−0.159	0.000	−0.202	−0.117	−0.004	−0.163	2.5
Mother's mental well-being when child was aged 3							
Common mental disorders (mcs<=50) (Ref.)							
No common mental disorders (mcs>50)	−0.117	0.000	−0.167	−0.066			

Source: Author's analysis of Growing Up in Scotland.
Note: * Adjusted for: Birth cohort, Mother's age, Mother's educational level, Child's gender, Child with limiting long-term illness, Siblings in the household, Mother's partnership trajectory, Non-resident father's interest in child.

As might be expected, mother's and child's socioemotional well-being are strongly and statistically associated. Children whose mothers' mental health score is indicative of no common mental disorders are 12 percentage points less likely to suffer from socioemotional problems themselves.

The inclusion of the variable in the model significantly mediates the effect of the employment variable on child well-being (Coef = –0.138, p-value = 0.047), reducing by 1.1 percentage points the difference between children of working and non-working mothers (from 11.3% to 10.2%). The psychological well-being of mothers contributes to explaining over 10% of the positive effect of employment on children's socioemotional well-being. The mediating effect of maternal well-being is stronger for mothers working in lower occupations, and for mothers working over 16 hours. Interestingly, the variable works in the opposite direction for mothers working below 15 hours per week, indicating a negative association between mini-jobs and mothers' well-being.

4.5 The role of childcare arrangements

The models' specifications in Tables 5 and 6 explore the role of childcare arrangements on the socioemotional well-being of children living with working lone mothers.

The results show that children whose mothers rely on childcare provided by grandparents do not fare differently from other children in terms of their well-being; and that this variable does not mediate the effect of employment on child well-being (Table 5, Models 4a–c).

On the other hand, children whose mothers use formal, centre-based childcare are more likely to show severe socioemotional problems at the age of 5 (Table 6, Models 5a–c).

The last set of model specifications includes the interaction between formal childcare and maternal employment, to explore whether the role of childcare varies depending on mothers' employment status, and on its characteristics.

Table 5: **Effects of care from relatives on the child's probability of severe socioemotional symptoms. Logistic regression model: Average Marginal Effects and significance levels**

	Direct effect				Indirect effect	Total effect	% mediated by mother's mental well-being
	AME	P-value	[95% Conf. Interval]				
Model 4a*							
Mother's employment status when child was aged 3							
Not in employment (Ref.)							
In employment	−0.105	0.000	−0.157	−0.052	−0.002	−0.107	2.4
Childcare from relatives when child was aged 3							
No (Ref.)							
Yes	−0.008	0.773	−0.065	0.048			
Model 4b*							
Mother's employment status and working hours when child was aged 3							
Not in employment (Ref.)							
In employment: 0–15 hours	−0.098	0.103	−0.217	0.019	−0.003	−0.101	2.5
In employment: 16–34 hours	−0.105	0.000	−0.163	−0.046	−0.003	−0.108	2.4
In employment: 35+ hours	−0.138	0.000	−0.203	−0.074	−0.002	−0.140	1.4
Childcare from relatives when child was aged 3							
No (Ref.)							
Yes	−0.008	0.771	−0.063	0.046			
Model 4c*							
Mother's employment and occupational status when child was aged 3							
Not in employment (Ref.)							
In employment: Routine and semi-routine occupations	−0.084	0.011	−0.148	−0.020	−0.006	−0.090	6.2
In employment: Intermediate occupations	−0.1589	0.000	−0.201	−0.115	−0.004	−0.162	2.5
In employment: Professional and managerial occupations	−0.155	0.000	−0.200	−0.109	−0.004	−0.159	2.6
Childcare from relatives when child was aged 3							
No (Ref.)							
Yes	−0.007	0.814	−0.06	0.050			

Note: * Adjusted for: Birth cohort, Mother's age, Mother's educational level, Child's gender, Child with limiting long-term illness, Siblings in the household, Mother's partnership trajectory, Non-resident father's interest in child.
Source: Author's analysis of Growing Up in Scotland.

Table 6: **Effects of formal centre-based care on the child's probability of severe socioemotional symptoms. Logistic regression model: Average Marginal Effects and significance levels**

	Direct effect				Indirect effect	Total effect	% mediated by mother's mental well-being
	AME	P-value	[95% Conf. Interval]				
Model 5a*							
Mother's employment status when child was aged 3							
Not in employment (Ref.)							
In employment	–0.114	0.000	–0.174	–0.054	0.007	–0.107	–6.3
Formal centre-based care when child was aged 3							
No (Ref.)							
Yes	0.067	0.057	–0.002	0.135			
Model 5b*							
Mother's employment status and working hours when child was aged 3							
Not in employment (Ref.)							
In employment: 0–15 hours	–0.113	0.055	–0.229	0.003	0.009	–0.104	–9.4
In employment: 16–34 hours	–0.114	0.001	–0.181	–0.046	0.007	–0.107	–6.6
In employment: 35+ hours	–0.149	0.000	–0.210	–0.087	0.008	–0.140	–5.9
Formal centre-based care when child was aged 3							
No (Ref.)							
Yes	0.070	0.047	0.001	0.140			
Model 5c*							
Mother's employment and occupational status when child was aged 3							
Not in employment (Ref.)							
In employment: Routine and semi-routine occupations	–0.097	0.008	–0.168	–0.025	0.009	–0.088	–9.9
In employment: Intermediate occupations	–0.170	0.000	–0.213	–0.126	0.007	–0.163	–4.3
In employment: Professional and managerial occupations	–0.168	0.000	–0.203	–0.115	0.009	–0.159	–5.9
Formal centre-based care when child was aged 3							
No (Ref.)							
Yes	0.092	0.007	0.025	0.159			

Source: Author's analysis of Growing Up in Scotland.
Note: * Adjusted for: Birth cohort, Mother's age, Mother's educational level, Child's gender, Child with limiting long-term illness, Siblings in the household, Mother's partnership trajectory, Non-resident father's interest in child.

Figure 1 reveals the existence of a significant interaction between the role of formal, centre-based care and maternal employment, showing that the negative effect of formal

childcare is only observed for children whose mothers do not work, whereas children of working mothers who are in formal, centre-based childcare show the lowest probabilities of severe socioemotional problems.

Figure 1: **Predicted probability of severe socioemotional symptoms, by mother's employment status and use of formal, centre-based care**
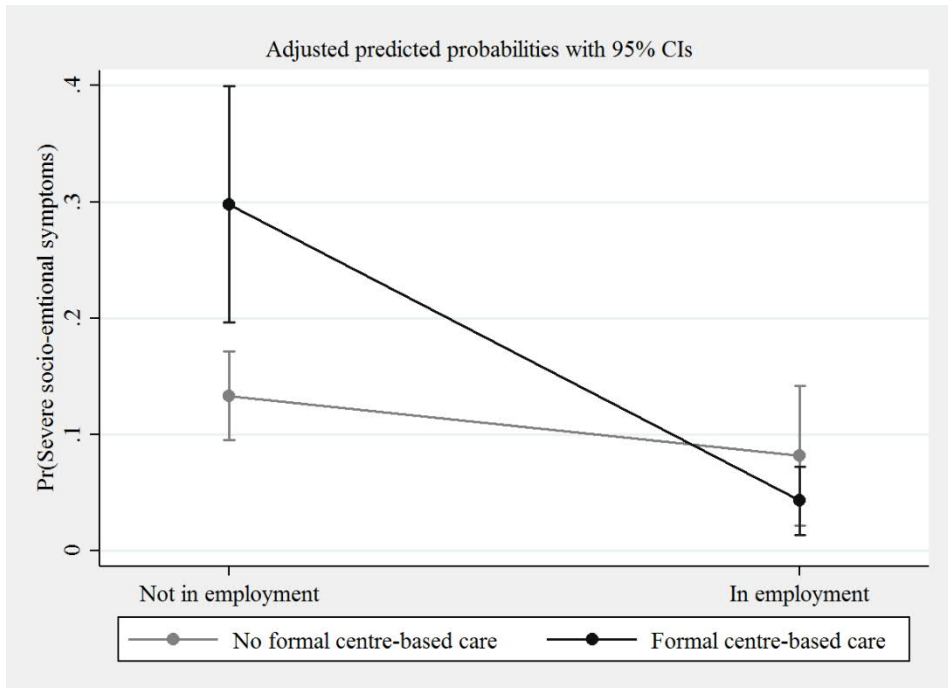
Source: Author's analysis of Growing Up in Scotland.

Figures 2 and 3 add a further qualification to the above finding, emphasising that it is children whose mothers work part-time or in lower status occupations that do better in terms of their socioemotional well-being if they attend formal, centre-based care (as compared to children relying on other type of childcare).

Figure 2: **Predicted probability of severe socioemotional symptoms, by mother's employment status and working hours and use of formal, centre-based care**
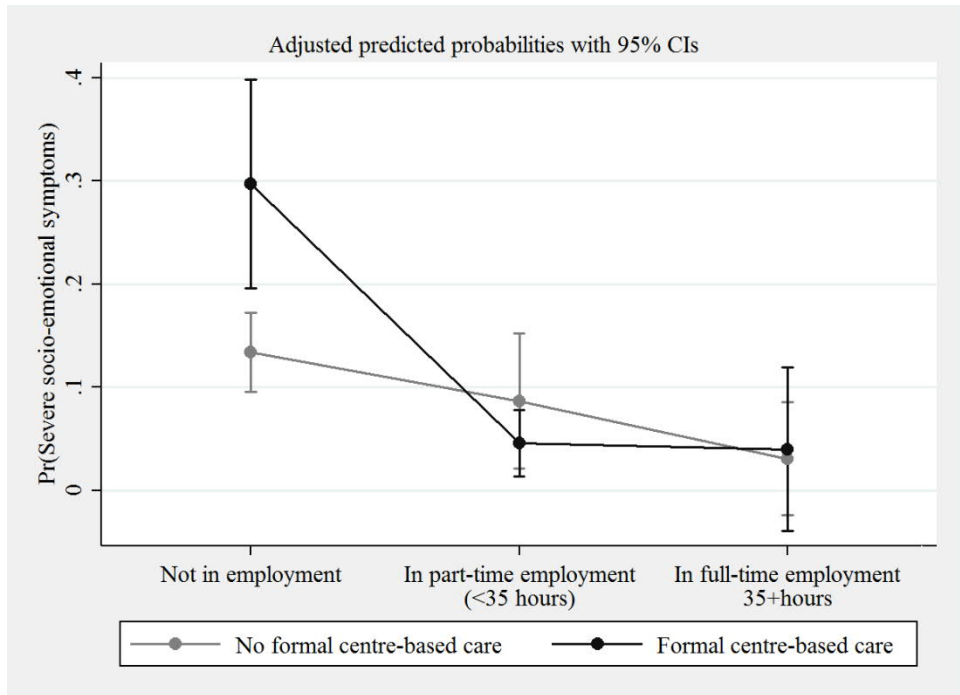
Source: Author's analysis of Growing Up in Scotland.

Figure 3: **Predicted probability of severe socioemotional symptoms, by mother's employment status and occupational status and use of formal, centre-based care**
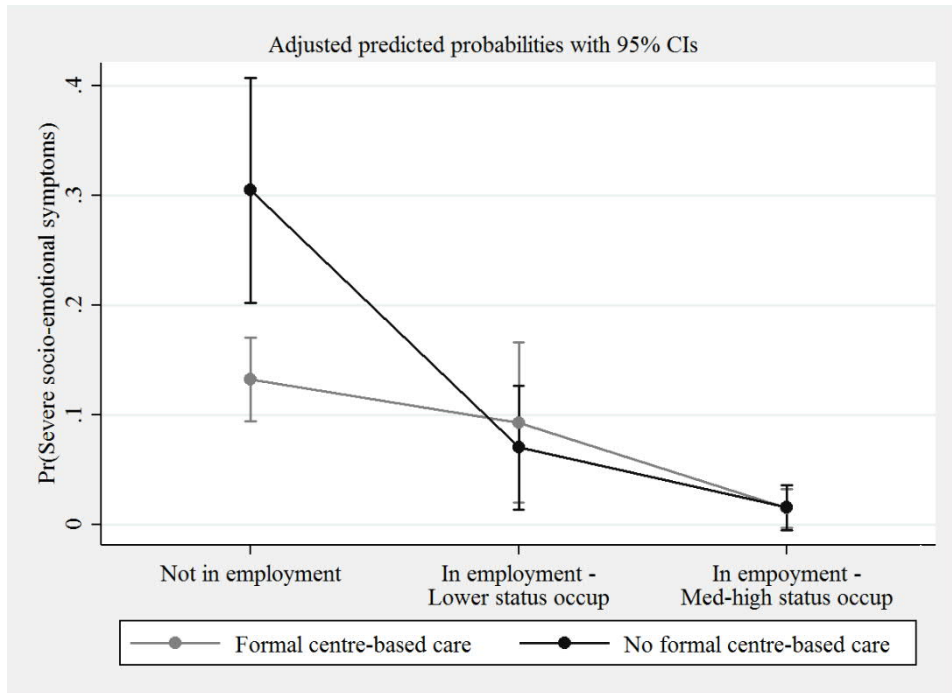
However, these findings cannot be generalised beyond our sample, as their estimates are too imprecise to make inference about the total population.

4.6 Robustness checks

The main analyses reported in this paper focus on children with severe socioemotional problems, and explore whether maternal employment can protect children from falling into this highly vulnerable group. Alternative specifications of the models used a different cut-off of the SDQ scores (Total difficulties scores > 14, thus distinguishing between children with normal socioemotional symptoms from children with slightly raised, severe, and very severe symptoms), and the SDQ scores as a continuous variable. Results

(available upon request) show that children of working mothers are less likely to show socioemotional symptoms that deviate from normality (AME = –0.08, p-value = 0.054), and that their total difficulties score is on average 1.7 points lower (p-value = 0.001) than for children of non-working mothers. Thus, maternal employment has a significant and positive effect on child well-being across different values of the outcome variable. Children whose mothers work full-time and children whose mothers work in intermediate occupations (such as clerical jobs) have the lowest mean total difficulties scores as well as the lowest probability of showing slightly raised (and above) socioemotional symptoms.

5. Discussion

This study contributes to understanding the relationship between maternal employment and the socioemotional well-being of children living with a lone mother. The focus is on Scotland, a country with a large share of families headed by lone mothers and a changing policy landscape that increasingly expects lone mothers to work.

The primary objective of the study is to ascertain whether and under which circumstances lone mothers' employment is beneficial to the well-being of their children. Its major strengths lie in the use of longitudinal data and in the adoption of a causal inference approach to reduce confounding due to characteristics associated with both maternal employment and child well-being.

The second aim of this study is to gain a deeper understanding of the role of maternal employment by addressing the issue of its heterogeneity with respect to occupational status and the number of hours worked. Results from the empirical analyses indicate that all types of maternal employment are favourable for children living with a lone mother – albeit with some important qualifications. First, children of lone mothers who work full-time are half as likely to have severe socioemotional problems compared to children whose mothers work part-time. The observed difference in the probability of severe symptoms between children whose mothers work in intermediate and high-status occupations and children whose mothers have lower status jobs is even wider. Overall, these findings indicate that maternal employment is not equally beneficial to all children, particularly if their mothers' jobs are low-paid and of poor quality. This confirms the inadequacy of simple policy interventions that view parental employment as a goal in itself (Strazdins et al. 2010).

In addition, this study seeks to unravel the pathways through which maternal employment exerts a positive influence on children's socioemotional well-being, by exploring the role played by the financial resources and the mental health of working lone mothers. Working mothers in our sample tend to declare higher levels of household

income and have better mental health than non-working mothers, with a lower percentage showing symptoms of anxiety and stress. Both household financial circumstances and maternal psychological well-being are associated with lower risks of severe socioemotional problems among children in the sample. Furthermore, results from the mediation analyses show that both aspects contribute to explaining the positive effect of maternal employment. That the role of household income is stronger is in line with other studies suggesting that economic resources play a large role in linking maternal employment to child outcomes in low-income families (Harvey 1999; Gennetian and Miller 2002). Interestingly, then, maternal well-being is negatively associated with employment in so-called mini-jobs, and the mediation analyses suggest that mothers' higher levels of anxiety and stress are a plausible mechanism through which these forms of employment are not beneficial to child well-being. The so-called mini-jobs were promoted as a way for lone parents to balance labour market participation with caring responsibilities and as a stepping-stone to working longer hours. However, their financial incentive in the current tax and benefits system is very weak, as parents lose entitlement to other sources of income support. Further, they tend to have lower responsibility and be less stable than longer part-time and full-time jobs (Bell, Brewer, and Phillips 2007). Mothers' feelings of insecurity and their difficulty managing financially thus undermine the potential mechanism through which work might improve health. This finding echoes previous work on lone parents with young children in United Kingdom, showing that requiring them to seek work – of any kind and at any cost – as a condition of receiving welfare benefits adversely affects their mental health (Katikireddi et al. 2018).

Lastly, lone mothers' ability to enter and maintain employment depends on their ability to find alternative childcare, and scholars have argued that good quality substitute care might, in turn, benefit their children. Results from this study only partially support this view. Although attending formal, centre-based childcare is associated with lower well-being for children of lone mothers on average, the same negative effect is not observed for the sub-sample of children of working mothers. While this finding provides some support for the view that reduced parent–child interactions due to mothers' employment might be compensated for by exposure to the stimulating environment of early learning and childcare settings, the negative association observed for children of non-working mothers deserves some attention. A possible explanation is that it is particularly children from more disadvantaged family backgrounds, whose entitlement to funded childcare commences earlier, or whose mothers cannot rely on any help from family and friends, who attend centre-based childcare, even though their mothers do not work.

Moreover, the study does not support the hypothesis of care from family members having a direct influence on child well-being. This might partly relate to the use of a very crude measure of relatives' care, which does not fully capture either the extent of their

involvement in supporting the family (e.g., through financial support) or the quality of the emotional bond with the mothers and their children. Also, it should be borne in mind that children who co-reside with their grandparents are excluded from the analysis, and it is often through co-residence that grandparents mitigate the adverse effects on children of growing up with a lone mother (Deleire and Kalil 2002; Dunifon and Kowaleski-Jones 2007). Nevertheless, nearly two-thirds of working lone mothers in this sample rely on childcare from relatives (mostly grandparents), and grandparents' availability to look after the child is one of the predictors of maternal employment (see Appendix). Thus, help from family members still plays a crucial, albeit indirect, role in the well-being of lone mothers' families.

6. Limitations and future developments

The current study has some limitations that deserve consideration. First, the empirical analyses focus on maternal employment at only one point in time, i.e., when the child is aged 3. This choice was dictated by an explicit interest in whether recent policy developments – namely the lowering of the child's age at which lone parents are expected to work, and the increase in funded childcare for children aged above 3 – are likely to positively affect not only the proportion of working lone parents, but also the well-being of their children. However, some scholars have emphasised the need to move away from static analysis of labour force participation to considering changes in maternal work and its conditions (Yoshikawa, Weisner, and Lowe 2006). Future development of this study could extend its scope to the analysis of longitudinal trajectories of maternal employment (see, for instance, the work by Kühhirt and Klein (2018)), paying attention in particular to patterns of job instability and moves in and out of employment. Similarly, a more dynamic approach to the study of child well-being could provide further insight into how the relationship between maternal employment and child well-being develops over time; for example, as a response to changes in maternal conditions. In this respect, Kim's (2011) work on the consequences of parental divorce for child development fully reaps the benefit of multi-wave study design by combining the use of growth curve models to estimate trajectories in children's outcomes with matching techniques to reduce confounding that can affect both their initial level and their development.

Second, this study demonstrates that employment is associated with household income and maternal well-being. However, employment status and its mediators are measured concurrently; furthermore, there could be unobserved confounders that influence both the mediators and child well-being. As a consequence, these associations are not causal estimates: rather they are suggestive – and only suggestive – of plausible pathways of influence on child well-being. Moreover, a large part of the positive effect

of maternal employment remains unexplained, and thus deserves further investigation. Future analyses could explore whether it is not only the level of income but also where it is coming from that makes a difference. A greater reliance on one's own earnings, rather than having to negotiate state benefits, might increase mothers' sense of entitlement to such money and their ability to use it to improve their children's experiences. Differences in parenting practices and family routines between working and non-working lone-mother households could also be an object of inquiry.

Some additional limitations were imposed by the data. While the analyses could distinguish employed mothers based on the number of hours worked, no distinction could be made based on mothers' working patterns – such as evening or weekend work – that have been found to be detrimental to the well-being of both mothers and their children (Downey and Coyne 1990; Stradzins et al. 2006). Future research should expand the study of the circumstances of parental work, as work itself is no guarantee of improved living conditions, as demonstrated by the increasing decoupling of work and security and the growth of working-poor households (Innes 2020). Previous research has also underlined the importance of good quality substitute care when the mother is at work. Unfortunately, this information was not available from GUS data. However, secure access to GUS data linked to administrative records on the quality of childcare settings is currently under evaluation. If granted, this resource would be extremely valuable to gain a fuller understanding of the role played by formal childcare.

Nevertheless, GUS data provides a large representative sample of children born in Scotland, thus enabling the study of a select group – that of children living with lone mothers – while still making use of a detailed account of their mothers' employment, and exploring a number of pathways through which maternal employment might affect their well-being. Moreover, the longitudinal design of the study and the availability of information on children and their families at the time of childbirth allowed the application of methods of causal inference, and made it possible to reduce the bias arising from self-selection of mothers with healthier children in employment. However, a truly causal interpretation of the estimates rests on the strong assumption of no further confounding by unmeasured variables. Although the models do include a rich set of observed covariates, the role of other unobserved characteristics cannot be excluded – an issue which is common to all observational data analyses. For instance, mothers' own attitudes to combining employment and childrearing, and the extent to which employment (and non-employment) is voluntary or involuntary, might be affecting simultaneously the likelihood of being in employment and the quality of parenting, with repercussions on child well-being. Levels of maternal employment and child well-being might also be conditioned upon opportunity structures and the quality of the residence context. These and other aspects, which the data did not measure, might still be confounding the true relationship between maternal employment and child well-being. Nevertheless, the

magnitude of the effect, and its robustness to the inclusion in the analyses of a large number of theoretically relevant confounders, are reassuring and should allay concerns about the extent of bias in the estimates.

7. Conclusions

This study investigates whether maternal employment can make a difference to the well-being of children living with a lone mother. The simple answer is yes. In Scotland, children of working lone mothers are less at risk of having severe socioemotional problems. Part of the beneficial effect of maternal employment is explained by working mothers' higher levels of household income and greater psychological well-being. However, not all types of employment are the same. Children whose mothers are employed in medium–high occupational positions have much lower risks of severe socioemotional problems than children of mothers with other job characteristics. These findings are noteworthy and have implications for policies aimed at improving the well-being and future life chances of children living in lone-parent households in Scotland.

The current UK government's emphasis on lone parents' welfare-to-work transition needs to be supported by initiatives to enhance the employability of lone parents and their ability to seek work, as well as their material circumstances – both through good quality, stable jobs that pay a decent income and through measures of income support. Moreover, funded and high-quality childcare has the potential to impact on children's well-being both indirectly, easing the work–family conflict and enabling more lone parents to work, and directly, offering a nurturing and stimulating environment for children when their parents are at work. Some positive actions in this direction have already been undertaken in Scotland. Devolved powers provide the opportunity to develop a two-generation approach that not only promotes lone parents' employment but also ensures that their children benefit from adequate material and non-material resources.

8. Acknowledgements

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Appendix 1

Table A-1: Description and measurement of the variables included in the analyses

Variable	Description	Time of measurement
Core variables		
Mother's employment status	A dummy variable that takes value 1 if the mother is employed when the child is aged 3.	At age 3
Mother's working hours	A categorical variable that combines information on the mother's employment status with the number of hours worked. It has the following categories: Not in employment; In employment: 0–15 hours; In employment: 16–34 hours; In employment: 36+ hours.	At age 3
Mother's occupational status	A categorical variable that combines information on the mother's employment status with occupational status. Occupational status is based on the National Statistics Socio-economic Classification (grouped to Analytical class), which provides an indication of socioeconomic position based on occupation. The variable has the following categories: Not in employment; In employment: Routine and semi-routine occupations; In employment: Intermediate occupations; In employment: Managerial and Professional occupations.	At age 3
Mediator/moderator variables		
Mother's mental health	The variable is based on the Mental Component Score (*mcs*) derived from the Short Form Health Survey (Ware et al. 1993) and it is dichotomised, classifying mothers with a score ≤ 50 as having common mental disorders (Gill et al. 2007).	At age 3
Household's equivalised income	Quintiles of the equivalised annual household income (using the OECD scale).	At age 3
Household financial resources	Categorical variable that provides a subjective evaluation of household financial resources. It is based on two distinct variables. For Birth Cohort 1 it uses 'Feelings about income': Living comfortably or very comfortably on present income (recoded as Good); Coping on present income (recoded as Alright); Finding it difficult or very difficult on present income (recoded as Bad). For Birth Cohort 2 it uses 'How household manages financially': Manage very or quite well (recoded as Good); Get by alright (recoded as Alright); Have some financial difficulties or deep financial troubles (recoded as Bad).	At age 3
Formal centre-based childcare	A dummy variable that takes value 1 if the child attends private crèche or nursery, local authority nursery, work crèche or nursery, or school nursery.	At age 3
Childcare from relatives	A dummy variable that takes value 1 if the mother relies on childcare from grandparents or other relatives.	At age 3

Table A-1:   **(Continued)**

Variable	Description	Time of measurement
Control variables		
Child's gender	The sex of the child.	At childbirth
Mother's age	The age of the mother at the birth of the child: Below 20, 20 and older.	At childbirth
Mother's educational level	This variable measures the mother's highest educational attainment. It is derived from the GUS variable Medu03, which is based on National Vocational Qualification levels. The original GUS variable is recoded as follows: Low: No qualifications, O levels, Standard grades, NVQ level 2 or below. Medium: A levels, Highers, NVQ level 3 or equivalent, Post-school, below degree (HNC, HND, NVQ level 4 or equivalent). High: Degree/NVQ level 5 or equivalent.	At childbirth
Child's limiting long-term illness	Dummy variable that takes value 1 if the child had a limiting long-term illness either at 10 months or at age 3.	At 10 months, and 3 years ─ combined.
Siblings in the household	Dummy variable that summarizes the presence of siblings in the household up to age 3. The variable takes value 0 (reference category) if the child grew up as an only child, value 1 if the child spent at least one sweep co-residing with natural siblings only, and value 2 if the child experienced more complex sibling configurations (at least one sweep with step- or half-sibling).	At 10 months and 3 years ─ combined.
Mother's partnership trajectory	Variable that summarizes the partnership experience of the child's mother up to age 3. The variable has the following categories: never in a cohabiting relationship; child's father moved out; more complex trajectories	At birth, 10 months, and 3 years ─ combined.
Non-resident father's interest in the child	Dummy variable that takes value 1 if the mother reports that the non-resident father is very interested in the child	At age 3

Table A-2: **Percentage distribution of the independent variables included in the analyses. Children living with a lone mother at age 3, by presence of severe socioemotional symptoms at age 5**

	Children with severe socioemotional problems		
	No	Yes	Total
Birth cohort			
2004–2005	45.5	41.9	45.1
2010–2011	54.5	58.1	54.9
Mother's age at childbirth			
20 and older	85.2	80.0	84.6
Below 20	14.8	20.0	15.4
Mother's educational level at childbirth			
Low	52.5	65.7	54.0
Medium	36.0	26.7	35.0
High	11.5	7.6	11.0
Child's gender			
Boy	49.9	61.0	51.2
Girl	50.1	39.0	48.8
Child with limiting long-term illness up to age 3			
No limiting long-term illness	96.3	89.5	95.5
Limiting long-term illness	3.7	10.5	4.5
Siblings in the household up to age 3			
No siblings	45.6	37.1	44.7
Biological siblings only	33.8	30.5	33.4
Other sibling configuration	20.6	32.4	21.9
Mother's partnership trajectory up to age 3			
Never in a cohabiting relationship	66.7	64.8	66.4
Child's father moved out	28.5	26.7	28.3
More complex trajectories	4.8	8.6	5.2
Non-resident father's interest in child when child was aged 3			
Very interested	46.9	31.4	45.1
Not so interested/no contact	53.1	68.6	54.9
Mother's employment status when child was aged 3			
Not in employment	48.8	75.2	51.9
In employment	51.2	24.8	48.1
Mother's employment status and working hours when child was aged 3			
Not in employment	48.8	75.2	51.9
In employment: 0–15 hours	3.5	3.8	3.5
In employment: 16–34 hours	36.4	18.1	34.3
In employment: 35+ hours	11.3	2.9	10.3
Mother's employment and occupational status when child was aged 3			
Not in employment	48.8	75.2	51.9
In employment: Routine and semi-routine occupations	23.2	17.2	22.5
In employment: Intermediate occupations	13.7	3.8	12.5
In employment: Professional and managerial occupations	14.3	3.8	13.1
Mother's mental well-being when child was aged 3			
Common mental disorders (mcs <= 50)	44.5	72.1	47.6
No common mental disorders (mcs > 50)	55.5	27.9	52.4
Household income when child was aged 3			
Lowest quintile	54.6	66.7	56
2nd quintile	19.6	14.3	19
3rd–5th quintiles	18.4	7.6	17.2
Info not available	7.4	11.4	7.8

Table A-2:   (Continued)

	Children with severe socioemotional problems		
	No	Yes	Total
Household financial situation when child was aged 3			
Bad	24.6	30.5	25.3
Alright	51.1	55.2	51.6
Good	24.3	14.3	23.1
Childcare from relatives when child was aged 3			
No	56.6	67.6	57.8
Yes	43.4	32.4	42.2
Formal centre-based care when child was aged 3			
No	68.6	65.7	68.3
Yes	31.4	34.3	31.7
Total	100.0	100.0	100.0
N	*813*	*105*	*918*
%	*88.6*	*11.4*	*100*

Note: Author's analysis of Growing Up in Scotland.

Appendix 2

Estimation of inverse probability of treatment weights

Table A-3a: **Logistic regression model of the mother's probability of being in employment when the child is aged 3. Average marginal effects and significance level**

	AME	P-value	[95% Conf. Interval]	
Mother's age at childbirth				
Below 20 (Ref.)				
Older than 20	0.089	0.053	−0.001	0.179
Mother's partnership status at childbirth				
Not in relationship with the child's father (Ref.)				
In relationship with the child's father	0.072	0.011	0.017	0.128
Mother's health status when child aged 10 months				
Poor health (Ref.)				
Good health	0.074	0.056	−0.002	0.150
Mother's educational level when child aged 10 months				
Medium	0.109	0.001	0.045	0.173
High	0.211	0.000	0.099	0.323
Mother's employment status prior to childbirth				
Not working (Ref.)				
Working during pregnancy but job ended before childbirth	0.177	0.000	0.079	0.275
Working during pregnancy and went on leave	0.488	0.000	0.416	0.559
Child's birth order				
Higher order (Ref.)				
First child	0.056	0.068	−0.004	0.116
Child with limiting long-term illness at 10 months				
No (Ref.)				
Limiting long-term illness	−0.008	0.926	−0.184	0.168
Child's birth weight				
Normal (Ref.)				
Low birth weight (<2500g)	−0.077	0.179	−0.189	0.035
Mother's concerns for child development, language, and behaviour at 10 months				
No concerns (Ref.)				
Some or a lot	−0.087	0.090	−0.187	0.014
Grandparents available to look after child for 1 hour when child aged 10 months				
Less often (Ref.)				
Every day or almost everyday	0.067	0.078	−0.008	0.141

Source: Author's analysis of Growing Up in Scotland.

Table A-3b: **Multinomial logistic regression model of the probability of the mother's working-hour arrangement when the child is aged 3. Average marginal effects and significance level**

	AME	P-value	[95% Conf. Interval]	
Outcome = In employment: 36+ hours				
Mother's age at childbirth				
Below 20 (Ref.)				
Older than 20	0.094	0.000	0.067	0.121
Mother's partnership status at childbirth				
Not in relationship with the child's father (Ref.)				
In relationship with the child's father	0.012	0.514	−0.023	0.047
Mother's health status when child aged 10 months				
Poor health (Ref.)				
Good health	0.016	0.451	−0.025	0.057
Mother's educational level when child aged 10 months				
Low (Ref.)				
Medium	0.023	0.216	−0.013	0.059
High	0.130	0.000	0.058	0.203
Mother's employment status prior to childbirth				
Not working (Ref.)				
Working during pregnancy but job ended before childbirth	0.027	0.276	−0.021	0.075
Working during pregnancy and went on leave	0.091	0.000	0.052	0.130
Child's birth order				
Higher order (Ref.)				
First child	0.026	0.147	−0.009	0.061
Child with limiting long-term illness at 10 months				
No (Ref.)				
Limiting long-term illness	−0.027	0.480	−0.101	0.047
Child's birth weight				
Normal (Ref.)				
Low birth weight (<2500g)	0.020	0.624	−0.059	0.098
Mother's concerns for child development, language, and behaviour at 10 months				
No concerns (Ref.)				
Some or a lot	0.007	0.840	−0.065	0.080
Grandparents available to look after child for 1 hour when child aged 10 months				
Less often (Ref.)				
Every day or almost everyday	0.102	0.000	0.050	0.154
Outcome = In employment: 16–35 hours				
Mother's age at childbirth				
Below 20 (Ref.)				
Older than 20	−0.010	0.825	−0.098	0.078
Mother's partnership status at childbirth				
Not in relationship with the child's father (Ref.)				
In relationship with the child's father	0.039	0.185	−0.018	0.096
Mother's health status when child aged 10 months				
Poor health (Ref.)				
Good health	0.048	0.218	−0.029	0.126
Mother's educational level when child aged 10 months				
Low (Ref.)				
Medium	0.061	0.060	−0.003	0.124
High	0.095	0.082	−0.012	0.203

Table A-3b: (Continued)

	AME	P-value	[95% Conf. Interval]	
Mother's employment status prior to childbirth				
Not working (Ref.)				
Working during pregnancy but job ended before childbirth	0.123	0.008	0.032	0.214
Working during pregnancy and went on leave	0.380	0.000	0.310	0.450
Child's birth order				
Higher order (Ref.)				
First child	0.030	0.321	−0.029	0.089
Child with limiting long-term illness at 10 months				
No (Ref.)				
Limiting long-term illness	−0.041	0.633	−0.211	0.128
Child's birth weight				
Normal (Ref.)				
Low birth weight (<2500g)	−0.109	0.051	−0.218	0.001
Mother's concerns for child development, language, and behaviour at 10 months				
No concerns (Ref.)				
Some or a lot	−0.074	0.151	−0.175	0.027
Grandparents available to look after child for 1 hour when child aged 10 months				
Less often (Ref.)				
Every day or almost everyday	−0.047	0.204	−0.119	0.025
Outcome = In employment: 0–15 hours				
Mother's age at childbirth				
Below 20 (Ref.)				
Older than 20	0.001	0.977	−0.041	0.042
Mother's partnership status at childbirth				
Not in relationship with the child's father (Ref.)				
In relationship with the child's father	0.021	0.096	−0.004	0.045
Mother's health status when child aged 10 months				
Poor health (Ref.)				
Good health	0.008	0.573	−0.020	0.036
Mother's educational level when child aged 10 months				
Low (Ref.)				
Medium	0.026	0.062	−0.001	0.053
High	−0.020	0.051	−0.040	0.000
Mother's employment status prior to childbirth				
Not working (Ref.)				
Working during pregnancy but job ended before childbirth	0.031	0.141	−0.010	0.071
Working during pregnancy and went on leave	0.017	0.253	−0.012	0.047
Child's birth order				
Higher order (Ref.)				
First child	−0.002	0.882	−0.030	0.026
Child with limiting long-term illness at 10 months				
No (Ref.)				
Limiting long-term illness	0.056	0.407	−0.077	0.190
Child's birth weight				
Normal (Ref.)				
Low birth weight (<2500g)	0.014	0.619	−0.042	0.070
Mother's concerns for child development, language, and behaviour at 10 months				
No concerns (Ref.)				
Some or a lot	−0.018	0.223	−0.047	0.011

Table A-3b: (Continued)

	AME	P-value	[95% Conf. Interval]	
Grandparents available to look after child for 1 hour when child aged 10 months				
Less often (Ref.)				
Every day or almost everyday	0.014	0.408	−0.019	0.047
Outcome = Not in employment				
Mother's age at childbirth				
Below 20 (Ref.)				
Older than 20	−0.085	0.067	−0.175	0.006
Mother's partnership status at childbirth				
Not in relationship with the child's father (Ref.)				
In relationship with the child's father	−0.071	0.012	−0.127	−0.015
Mother's health status when child aged 10 months				
Poor health (Ref.)				
Good health	−0.072	0.062	−0.148	0.003
Mother's educational level when child aged 10 months				
Low (Ref.)				
Medium	−0.110	0.001	−0.173	−0.046
High	−0.206	0.000	−0.317	−0.095
Mother's employment status prior to childbirth				
Not working (Ref.)				
Working during pregnancy but job ended before childbirth	−0.180	0.000	−0.278	−0.083
Working during pregnancy and went on leave	−0.489	0.000	−0.560	−0.417
Child's birth order				
Higher order (Ref.)				
First child	−0.054	0.079	−0.114	0.006
Child with limiting long-term illness at 10 months				
No (Ref.)				
Limiting long-term illness	0.011	0.898	−0.164	0.187
Child's birth weight				
Normal (Ref.)				
Low birth weight (<2500g)	0.075	0.182	−0.035	0.185
Mother's concerns for child development, language, and behaviour at 10 months				
No concerns (Ref.)				
Some or a lot	0.085	0.095	−0.015	0.184
Grandparents available to look after child for 1 hour when child aged 10 months				
Less often (Ref.)				
Every day or almost everyday	−0.069	0.067	−0.143	0.005

Source: Author's analysis of Growing Up in Scotland.

Table A-3c: **Multinomial logistic regression model of the probability of the mother's occupational status when the child is aged 3. Average marginal effects and significance level**

	AME	P-value	[95% Conf. Interval]	
Outcome = In employment: Professional and managerial occupations				
Mother's age at childbirth				
Below 20 (Ref.)				
Older than 20	0.068	0.005	0.021	0.115
Mother's partnership status at childbirth				
Not in relationship with the child's father (Ref.)				
In relationship with the child's father	0.015	0.386	−0.019	0.050
Mother's health status when child aged 10 months				
Poor health (Ref.)				
Good health	0.023	0.252	−0.016	0.062
Mother's educational level when child aged 10 months				
Low (Ref.)				
Medium	0.037	0.042	0.001	0.073
High	0.320	0.000	0.221	0.419
Mother's employment status prior to childbirth				
Not working (Ref.)				
Working during pregnancy but job ended before childbirth	0.002	0.930	−0.042	0.046
Working during pregnancy and went on leave	0.104	0.000	0.061	0.148
Child's birth order				
Higher order (Ref.)				
First child	0.010	0.585	−0.025	0.044
Child with limiting long-term illness at 10 months				
No (Ref.)				
Limiting long-term illness	−0.066	0.017	−0.120	−0.012
Child's birth weight				
Normal (Ref.)				
Low birth weight (<2500g)	−0.025	0.323	−0.076	0.025
Mother's concerns for child development, language, and behaviour at 10 months				
No concerns (Ref.)				
Some or a lot	−0.019	0.563	−0.083	0.045
Grandparents available to look after child for 1 hour when child aged 10 months				
Less often (Ref.)				
Every day or almost everyday	0.051	0.022	0.007	0.094
Outcome = In employment: Intermediate occupations				
Mother's age at childbirth				
Below 20 (Ref.)				
Older than 20	0.062	0.022	0.009	0.115
Mother's partnership status at childbirth				
Not in relationship with the child's father (Ref.)				
In relationship with the child's father	0.027	0.198	−0.014	0.068
Mother's health status when child aged 10 months				
Poor health (Ref.)				
Good health	0.029	0.219	−0.017	0.076
Mother's educational level when child aged 10 months				
Low (Ref.)				
Medium	0.061	0.007	0.017	0.106
High	0.024	0.470	−0.042	0.091

Table A-3c: (Continued)

	AME	P-value	[95% Conf. Interval]	
Mother's employment status prior to childbirth				
Not working (Ref.)				
Working during pregnancy but job ended before childbirth	0.051	0.063	−0.003	0.105
Working during pregnancy and went on leave	0.150	0.000	0.106	0.195
Child's birth order				
Higher order (Ref.)				
First child	0.033	0.105	−0.007	0.073
Child with limiting long-term illness at 10 months				
No (Ref.)				
Limiting long-term illness	0.030	0.645	−0.098	0.158
Child's birth weight				
Normal (Ref.)				
Low birth weight (<2500g)	−0.025	0.503	−0.097	0.048
Mother's concerns for child development, language, and behaviour at 10 months				
No concerns (Ref.)				
Some or a lot	0.010	0.780	−0.061	0.082
Grandparents available to look after child for 1 hour when child aged 10 months				
Less often (Ref.)				
Every day or almost everyday	−0.034	0.146	−0.080	0.012
Outcome = In employment: Routine and semi-routine occupations				
Mother's age at childbirth				
Below 20 (Ref.)				
Older than 20	−0.033	0.455	−0.120	0.054
Mother's partnership status at childbirth				
Not in relationship with the child's father (Ref.)				
In relationship with the child's father	0.030	0.283	−0.025	0.084
Mother's health status when child aged 10 months				
Poor health (Ref.)				
Good health	0.020	0.583	−0.051	0.091
Mother's educational level when child aged 10 months				
Low (Ref.)				
Medium	0.011	0.729	−0.050	0.072
High	−0.155	0.000	−0.227	−0.083
Mother's employment status prior to childbirth				
Not working (Ref.)				
Working during pregnancy but job ended before childbirth	0.125	0.004	0.039	0.212
Working during pregnancy and went on leave	0.230	0.000	0.165	0.296
Child's birth order				
Higher order (Ref.)				
First child	0.010	0.728	−0.048	0.069
Child's with limiting long-term illness at 10 months				
No (Ref.)				
Limiting long-term illness	0.029	0.753	−0.150	0.207
Child's birth weight				
Normal (Ref.)				
Low birth weight (<2500g)	−0.021	0.703	−0.127	0.086
Mother's concerns for child development, language, and behaviour at 10 months				
No concerns (Ref.)				
Some or a lot	−0.078	0.089	−0.168	0.012

Table A-3c: (Continued)

	AME	P-value	[95% Conf. Interval]	
Grandparents available to look after child for 1 hour when child aged 10 months				
Less often (Ref.)				
Every day or almost everyday	0.050	0.166	−0.021	0.121
Outcome = Not in employment				
Mother's age at childbirth				
Below 20 (Ref.)				
Older than 20	−0.097	0.037	−0.188	−0.006
Mother's partnership status at childbirth				
Not in relationship with the child's father (Ref.)				
In relationship with the child's father	−0.072	0.011	−0.127	−0.017
Mother's health status when child aged 10 months				
Poor health (Ref.)				
Good health	−0.072	0.060	−0.147	0.003
Mother's educational level when child aged 10 months				
Low (Ref.)				
Medium	−0.109	0.001	−0.173	−0.046
High	−0.189	0.001	−0.303	−0.076
Mother's employment status prior to childbirth				
Not working (Ref.)				
Working during pregnancy but job ended before childbirth	−0.179	0.000	−0.275	−0.082
Working during pregnancy and went on leave	−0.485	0.000	−0.557	−0.414
Child's birth order				
Higher order (Ref.)				
First child	−0.053	0.086	−0.114	0.008
Child with limiting long-term illness at 10 months				
No (Ref.)				
Limiting long-term illness	0.007	0.939	−0.169	0.182
Child's birth weight				
Normal (Ref.)				
Low birth weight (<2500g)	0.071	0.202	−0.038	0.180
Mother's concerns for child development, language, and behaviour at 10 months				
No concerns (Ref.)				
Some or a lot	0.087	0.086	−0.012	0.186
Grandparents available to look after child for 1 hour when child aged 10 months				
Less often (Ref.)				
Every day or almost everyday	−0.067	0.077	−0.141	0.007

Source: Author's analysis of Growing Up in Scotland.

Table A-4a: Percentage distribution of confounders measured at baseline by mother's employment status, before and after the application of IPW to the sample

	Before IPW			After IPW		
	In employment	Not in employment	Total	In employment	Not in employment	Total
Mother's age at childbirth						
Below 20	10.7	23.6	18.0	17.3	17.1	17.2
Older than 20	89.3	76.4	82.0	82.7	82.9	82.8
Mother's partnership status at childbirth						
Not in relationship with the child's father	49.4	61.8	56.4	53.3	56.7	55.2
In relationship with the child's father	50.6	38.2	43.6	46.7	43.3	44.8
Mother's health status when child aged 10 months						
Poor health	13.7	23.0	19.0	20.0	20.8	20.4
Good health	86.3	77.0	81.0	80.0	79.2	79.6
Mother's educational level when child aged 10 months						
Low	41.3	72.1	58.6	52.7	56.7	54.9
Medium	43.2	24.2	32.4	36.0	33.9	34.8
High	15.5	3.8	8.9	11.3	9.5	10.3
Mother's employment status prior to childbirth						
Not working	14.9	64.3	42.7	36.7	41.5	39.3
Working during pregnancy but job ended before childbirth	12.1	16.3	14.5	15.2	14.0	14.5
Working during pregnancy and went on leave	73.0	19.4	42.8	48.1	44.5	46.1
Child's birth order						
Higher order	40.3	52.6	47.2	45.6	48.8	47.3
First child	59.7	47.4	52.8	54.4	51.2	52.7
Child with limiting long-term illness at 10 months						
No	97.0	96.3	96.6	96.1	96.0	96.0
Limiting long-term illness	3.0	3.7	3.4	3.9	4.0	4.0
Child's birth weight						
Normal	94.7	89.2	91.6	93.5	91.8	92.6
Low birth weight (<2500g)	5.3	10.8	8.4	6.5	8.2	7.4
Mother's concerns for child development, language, and behaviour at 10 months						
No concerns	93.6	90.6	91.9	91.7	91.7	91.7
Some or a lot	6.4	9.4	8.1	8.3	8.3	8.3
Grandparents available to look after child for 1 hour when child aged 10 months						
Less often	76.8	84.8	81.3	81.0	83.6	82.4
Every day or almost everyday	23.2	15.2	18.7	19.0	16.4	17.6

Source: Author's analysis of Growing Up in Scotland.

Table A-4b: **Percentage distribution of confounders measured at baseline by mother's working hours arrangement, before and after the application of IPW to the sample**

	Before IPW				
	In employment: 35+ hours	In employment: 16–34 hours	In employment: 0–15 hours	Not in employment	Total
Mother's age at childbirth					
Below 20 (Ref.)	1.4	12.8	15.5	23.6	18.0
Older than 20	98.6	87.2	84.5	76.4	82.0
Mother's partnership status at childbirth					
Not in relationship with the child's father (Ref.)	46.1	51.0	43.3	61.8	56.4
In relationship with the child's father	53.9	49.0	56.7	38.2	43.6
Mother's health status when child aged 10 months					
Poor health (Ref.)	13.0	13.9	13.7	23.0	19.0
Good health	87.0	86.1	86.3	77.0	81.0
Mother's educational level when child aged 10 months					
Low (Ref.)	31.2	44.0	43.1	72.1	58.6
Medium	40.4	42.7	54.9	24.2	32.4
High	28.4	13.3	2.0	3.8	8.9
Mother's employment status prior to childbirth					
Not working (Ref.)	10.2	15.1	25.6	64.3	42.7
Working during pregnancy but job ended before childbirth	8.3	12.1	21.8	16.3	14.5
Working during pregnancy and went on leave	81.5	72.7	52.6	19.4	42.8
Child's birth order					
Higher order (Ref.)	37.2	40.4	48.2	52.6	47.2
First child	62.8	59.6	51.8	47.4	52.8
Child with limiting long-term illness at 10 months					
No	97.2	97.4	92.6	96.3	96.6
Limiting long-term illness	2.8	2.6	7.4	3.7	3.4
Child's birth weight					
Normal	92.9	95.7	90.4	89.2	91.6
Low birth weight (<2500g)	7.1	4.3	9.6	10.8	8.4
Mother's concerns for child development, language, and behaviour at 10 months					
No concerns	92.0	94.0	94.0	90.6	91.9
Some or a lot	8.0	6.0	6.0	9.4	8.1
Grandparents available to look after child for 1 hour when child aged 10 months					
Less often (Ref.)	62.3	80.9	76.1	84.8	81.3
Every day or almost everyday	37.7	19.1	23.9	15.2	18.7

Table A-4b: (Continued)

	After IPW				
	In employment: 35+ hours	In employment: 16–34 hours	In employment: 0–15 hours	Not in employment	Total
Mother's age at childbirth					
Below 20 (Ref.)	3.6	17.0	12.9	17.1	15.8
Older than 20	96.4	83.0	87.1	82.9	84.2
Mother's partnership status at childbirth					
Not in relationship with the child's father (Ref.)	48.7	53.5	44.3	56.7	54.5
In relationship with the child's father	51.3	46.5	55.7	43.3	45.5
Mother's health status when child aged 10 months					
Poor health (Ref.)	14.9	20.9	29.5	20.7	20.6
Good health	85.1	79.1	70.5	79.3	79.4
Mother's educational level when child aged 10 months					
Low (Ref.)	43.1	51.6	46.2	56.7	53.5
Medium	44.3	37.3	34.1	33.8	35.8
High	12.6	11.0	19.7	9.5	10.6
Mother's employment status prior to childbirth					
Not working (Ref.)	31.4	37.4	45.9	41.4	39.4
Working during pregnancy but job ended before childbirth	13.6	15.3	11.8	14.0	14.3
Working during pregnancy and went on leave	54.9	47.3	42.3	44.6	46.2
Child's birth order					
Higher order (Ref.)	44.1	47.8	54.4	48.7	48.2
First child	55.9	52.2	45.6	51.3	51.8
Child with limiting long-term illness at 10 months					
No	97.7	95.7	95.9	96.1	96.1
Limiting long-term illness	2.3	4.3	4.1	3.9	3.9
Child's birth weight					
Normal	94.0	92.7	92.3	91.9	92.3
Low birth weight (<2500g)	6.0	7.3	7.7	8.1	7.7
Mother's concerns for child development, language, and behaviour at 10 months					
No concerns	92.6	89.9	95.4	91.7	91.3
Some or a lot	7.4	10.1	4.6	8.3	8.7
Grandparents available to look after child for 1 hour when child aged 10 months					
Less often (Ref.)	82.1	79.6	83.4	83.5	82.1
Every day or almost everyday	17.9	20.4	16.6	16.5	17.9

Source: Author's analysis of Growing Up in Scotland.

Table A-4c: **Percentage distribution of confounders measured at baseline by mother's occupational status, before and after the application of IPW to the sample**

	Before IPW				
	Professional and managerial occupations	Intermediate occupations	Routine and semi-routine occupations	Not in employment	Total
Mother's age at childbirth					
Below 20 (Ref.)	2.7	4.2	17.7	23.6	18
Older than 20	97.3	95.8	82.3	76.4	82
Mother's partnership status at childbirth					
Not in relationship with the child's father (Ref.)	40.4	46.7	55	61.8	56.4
In relationship with the child's father	59.6	53.3	45	38.2	43.6
Mother's health status when child aged 10 months					
Poor health (Ref.)	12.1	12.2	15.3	23	19
Good health	87.9	87.8	84.7	77	81
Mother's educational level when child aged 10 months					
Low (Ref.)	21.4	32.8	54.9	72.1	58.6
Medium	34.4	54.3	41.6	24.2	32.4
High	44.2	12.9	3.4	3.8	8.9
Mother's employment status prior to childbirth					
Not working (Ref.)	9.7	8	20.9	64.3	42.7
Working during pregnancy but job ended before childbirth	5	10.6	16.1	16.3	14.5
Working during pregnancy and went on leave	85.3	81.4	63	19.4	42.8
Child's birth order					
Higher order (Ref.)	39.2	37.8	42.1	52.6	47.2
First child	60.8	62.2	57.9	47.4	52.8
Child with limiting long-term illness at 10 months					
No	98.6	95.8	96.9	96.3	96.6
Limiting long-term illness	1.4	4.2	3.1	3.7	3.4
Child's birth weight					
Normal	95.8	94.6	94.3	89.2	91.6
Low birth weight (<2500g)	4.2	5.4	5.7	10.8	8.4
Mother's concerns for child development, language, and behaviour at 10 months					
No concerns	94.9	90.8	94.3	90.6	91.9
Some or a lot	5.1	9.2	5.7	9.4	8.1
Grandparents available to look after child for 1 hour when child aged 10 months					
Less often (Ref.)	72.5	83.3	75.4	84.8	81.3
Every day or almost everyday	27.5	16.7	24.6	15.2	18.7

Table A-4c: (Continued)

	After IPW				
	Professional and managerial occupations	Intermediate occupations	Routine and semi-routine occupations	Not in employment	Total
Mother's age at childbirth					
Below 20 (Ref.)	8.5	11.1	17.1	16.6	15.3
Older than 20	91.5	88.9	82.9	83.4	84.7
Mother's partnership status at childbirth					
Not in relationship with the child's father (Ref.)	52.7	45.9	53.3	56.3	54.1
In relationship with the child's father	47.3	54.1	46.7	43.7	45.9
Mother's health status when child aged 10 months					
Poor health (Ref.)	17.3	17.1	18.8	20.2	19.3
Good health	82.7	82.9	81.2	79.8	80.7
Mother's educational level when child aged 10 months					
Low (Ref.)	43.5	45	53.9	55.8	53
Medium	43.6	42.1	35.9	33.6	36
High	12.9	12.9	10.1	10.6	11
Mother's employment status prior to childbirth					
Not working (Ref.)	23.8	32.9	37	41	37.5
Working during pregnancy but job ended before childbirth	14.6	15.3	15.5	13.8	14.4
Working during pregnancy and went on leave	61.6	51.9	47.4	45.2	48
Child's birth order					
Higher order (Ref.)	43.6	48.9	44.8	48.6	47.3
First child	56.4	51.1	55.2	51.4	52.7
Child with limiting long-term illness at 10 months					
No	99.7	95.2	96.8	96.3	96.6
Limiting long-term illness	0.3	4.8	3.2	3.7	3.4
Child's birth weight					
Normal	95.4	92	94.9	91.9	93
Low birth weight (<2500g)	4.6	8	5.1	8.1	7
Mother's concerns for child development, language, and behaviour at 10 months					
No concerns	95.1	92.2	91	91.5	91.8
Some or a lot	4.9	7.8	9	8.5	8.2
Grandparents available to look after child for 1 hour when child aged 10 months					
Less often (Ref.)	84.5	76.5	81.2	84	82.6
Every day or almost everyday	15.5	23.5	18.8	16	17.4

Source: Author's analysis of Growing Up in Scotland.