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Article

Family income, maternal psychological distress and child socio-emotional behaviour: Longitudinal findings from the UK Millennium Cohort Study^{☆, ☆, ☆}

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ABSTRACT

The association between low family income and socio-emotional behaviour problems in early childhood has been well-documented, and maternal psychological distress is highlighted as central in mediating this relationship. However, whether this relationship holds for older children, and the precise mechanisms by which income may influence child behaviour is unclear.

This study investigated the relationship between family income and child socio-emotional behaviour at 11 years of age, and examined the mediating role of maternal psychological distress over time using the UK Millennium Cohort Study.

The primary outcome was parent-reported behavioural problems, as captured by the Total Difficulties Score (TDS), derived from the Strengths and Difficulties Questionnaire (SDQ). Secondary outcomes were the emotional, peer-related, conduct, and hyperactivity/inattention problems subscales of the SDQ; and teacher-reported TDS. Permanent family income was the primary exposure variable; frequency of poverty up to age 11 years was the secondary exposure variable. Maternal psychological distress was operationalised to reflect the trajectory from child birth to age 11. Multivariable logistic regression models were used to estimate the effect of permanent family income on child behaviour at age 11, controlling for maternal psychological distress and other relevant covariates.

Results showed a statistically significant protective effect of increased permanent family income on the likelihood of behavioural problems at age 11. This finding was consistent for all SDQ subscales apart from emotional problems, and was strongest for teacher-reported behavioural problems. Maternal distress was an important mediator in the income-child behaviour relationship for parent-reported, but not teacher-reported, behavioural problems.

The results of this study strengthen empirical evidence that the child behaviour-income gradient is maintained in older childhood. Mother's psychological distress, particularly longstanding or recurrent, appears to contribute to this relationship. These findings may validate calls for psychosocial and financial supports for families affected by parental mental health issues.

Introduction

Child health and development, and their relationship with socio-economic status, are complex and important issues spanning an array of disciplines including public health, economics, developmental psychology, and social policy. Health experienced in childhood and adolescence affects human capital accumulation, as well as health and labour market status in adulthood (Currie et al., 2008; Lundborg, Nilsson & Rooth, 2014). In the UK, stark inequalities in child physical and mental health have been linked to poverty and social disadvantage

(Social Mobility and Child Poverty Commission, 2017). However, measures to financially assist families with children have been reduced, and the government's dedicated unit to eliminate child poverty was abolished in 2016 (Social Mobility and Child Poverty Commission, 2017; Social Mobility and Child Poverty Commission, 2015; Merrick, 2017). Although studies have consistently documented poorer behavioural outcomes in children with economic deprivation, the precise mechanisms by which income affects health, and how this association may change with age, is less well-understood. Identifying the factors through which income affects both physical and mental health may

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provide alternative ways to improve health which complement financial contributions.

Increasing attention in recent years has been paid to child development, including behavioural outcomes, and their relationship with economic hardship. Child behavioural difficulties not only reflect impaired mental health, but they are also linked to adult outcomes, including academic attainment and employment (Najman, Aird, Bor, O'Callaghan, Williams, and Shuttlewood, 2004). Problems in child socio-emotional behaviour have been associated with poorer health and behavioural outcomes, such as: obesity; substance abuse; juvenile delinquency; and criminality (Fergusson et al., 2005). Socio-emotional development encompasses externalising behaviours, such as conduct and hyperactivity problems, and internalising behaviours, including emotional and peer problems (Goodman, Lamping, and Ploubidis, 2010). This study seeks to add to the current body of evidence by, firstly, establishing whether the observed association between family income and behaviour in early childhood is maintained in later childhood; secondly, by exploring the role of maternal mental health as a potential mediating mechanism, examining different trajectories of maternal psychological distress over time; and thirdly, building on knowledge of early childhood development, exploring the extent to which later childhood factors may shape child behaviour at age 11. In theory, the relationship may strengthen as a child becomes older, as observed by Currie and Stabile (2003). They suggested that the harmful effects of economic hardship accumulate over time, and that low income children are subject to a greater number of adverse health events than children from higher-income families. A steepening effect of family resources on socio-emotional behaviour over time has been replicated in several more recent studies, possibly reflecting a cumulative effect of economic deprivation (Condliffe & Link, 2008; Khanam, et al., 2009; Fletcher and Wolfe, 2014; Murasko, 2008; Fletcher and Wolfe, 2016). Heckman and colleagues' dynamic framework for capability formation (Conti & Heckman, 2012) suggests that capabilities (including socio-emotional skills) are self-productive, such that better capabilities in earlier years enhance development of capabilities at future ages. They also propose sensitive and critical periods, referring to ages at which parental inputs, enabled by higher family income, are more productive in improving capabilities (Conti & Heckman, 2012). It is therefore possible that socio-emotional skills at age 11 are more important than early years for long-term outcomes, for example due to the age at which children are involved in education.

The findings of this study may be relevant to policy makers regarding financial assistance for families at different stages of child development, as well as to clinicians in supporting the mental health of mothers.

Previous research

The child health-family income gradient refers to the positive association between health and wealth and its origins in childhood (Case et al., 2002), and has been the subject of a growing body of literature within the field of health economics (Propper et al., 2007; Currie, Shields & Price, 2007). It was explored in the influential studies by Case et al. (2002) and Currie and Stabile (2003) using US and Canadian data of children up to age 17, respectively.

Across the literature, it has been consistently demonstrated that children from higher income families also exhibit better behavioural outcomes, from as early as 3 years of age (Najman et al., 2004; Brooks-Gunn & Duncan, 1997; Taylor, Dearing & McCartney, 2004; Bradshaw & Holmes, 2008; Kiernan & Huerta, 2008; Korenman, Miller & Sjaastad, 1995; Kiernan & Mensah, 2009). However, the magnitude of this effect and the pathways through which it operates are less clear. Permanent income has been more strongly linked with behavioural problems than current income, (Taylor et al., 2004; Blau, 1999; Curtis, Dooley, Lipman & Feeny, 2001) and persistent financial adversity is consistently associated with childhood behavioural problems (Fletcher & Wolfe, 2016;

Brooks-Gunn & Duncan, 1997; Korenman et al., 1995; Ackerman, Brown & Izard, 2004; Holmes & Kiernan, 2013). In two recent studies using Millennium Cohort Study (MCS) data when children were aged 11 years, both persistent poverty and first transitions into poverty were strongly linked to childhood mental health problems (Fitzsimons, Goodman, Kelly & Smith, 2017; Wickham, Whitehead, Taylor-Robinson & Barr, 2017).

The mechanisms by which family income exerts an impact on child development has been investigated through both psychological and economic frameworks, namely the parental stress and parental investment theories. The parental investment theory takes a human capital approach, reflecting the ability of parents to invest resources to support their child's development, particularly with learning and cognition (Yeung, Linver & Brooks-Gunn, 2002; Duncan, Magnuson & Votruba-Drzal, 2014). The family stress theory suggests that adverse circumstances such as poverty may create a stressful home environment, which contributes to psychological distress in parents and children (Kiernan & Huerta, 2008; Holmes & Kiernan, 2013). This distress may filter into parenting practices, which tend to be punitive, inconsistent and less nurturing (Duncan et al., 2014). Studies using MCS data for children at 3 and 5 years of age have found that a significant proportion of the effect of economic deprivation on externalising behaviour was accounted for by parenting behaviours (Kiernan & Huerta, 2008; Holmes & Kiernan, 2013). Yeung et al., (2002) found that family income was associated with children's externalising behaviour primarily via maternal emotional distress and parenting practices, in US children aged 3 to 5 years. Both the parental stress and parental investment pathways were explored by Violato et al. (2011) in British children aged 3 and 5 years, finding that the direct effect of income on socio-emotional behaviour reduced substantially when parental stress and investment factors were adjusted for. An Australian study by Khanam and Nghiem (2016) found that family income was no longer significantly associated with non-cognitive development of children up to age 7 after controlling for parental stress and investment variables. A 2015 study by Akee, Simeonova, Costello, and Copeland (2015) in US adolescents found that parenting and family relationships were important potential channels through which household income influences emotional-behavioural outcomes.

The role of maternal mental health has been highlighted as central in mediating the effect of family income (Kiernan & Mensah, 2009; Violato et al., 2011; Khanam & Nghiem, 2016; Schoon, Hope, Ross & Duckworth, 2010; Washbrook et al., 2014). Persistent maternal mental health problems have been most strongly associated with child behavioural problems (Fitzsimons et al., 2017; Schoon et al., 2010; Mensah & Kiernan, 2010). While the role of maternal psychological distress is well established in the relationship between family income and early child development, there is paucity of evidence as to whether this relationship holds for older children. Furthermore, no studies explore child socio-emotional outcomes and different patterns of maternal psychological distress over time.

Methods

Data

The MCS is a longitudinal cohort study of 18,818 children born in the UK between September 2000 and January 2002 (Hansen, 2014). It is a multidisciplinary survey developed to capture the effects of social, economic and health advantages and disadvantages on childhood development and other outcomes (Hansen, 2014). There have been six surveys to date, the first collected when the children were around 9 months of age, followed by surveys at ages 3, 5, 7, 11 and 14. At the time this study was conducted (2016) only the first five surveys were available. There were 13,287 children remaining in the study at the end of the fifth survey (Hansen, 2014). The MCS oversampled from areas with higher levels of poverty, as well as higher proportions of ethnic

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