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Research Report

Exposure to socioeconomic adversity in early life and risk of depression at 18 years: The mediating role of locus of control

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ABSTRACT

Background: Previous studies have linked exposure to early socioeconomic adversity to depression, but the mechanisms of this association are not well understood. Locus of control (LoC), an individual's control-related beliefs, has been implicated as a possible mechanism, however, longitudinal evidence to support this is lacking.

Methods: The study sample comprised 8803 participants from a UK cohort, the Avon Longitudinal Study of Parents and Children (ALSPAC). Indicators of early socioeconomic adversity were collected from the antenatal period to 5 years and modelled as a latent factor. Depression was assessed using the Clinical Interview Schedule-Revised (CIS-R) at 18 years. LoC was assessed with the Nowicki–Strickland Internal–External (CNSIE) scale at 16 years.

Results: Using structural equation modelling, we found that 34% of the total estimated association between early socioeconomic adversity and depression at 18 years was explained by external LoC at 16 years. There was weak evidence of a direct pathway from early socioeconomic adversity to depression after accounting for the indirect effect via external locus of control. Socioeconomic adversity was associated with more external LoC, which, in turn, was associated with depression.

Limitations: Attrition may have led to an underestimation of the direct and indirect effect sizes in the complete case analysis.

Conclusions: Results suggest that external LoC in adolescence is one of the factors mediating the link between early adversity and depression at 18 years. Cognitive interventions that seek to modify maladaptive control beliefs in adolescence may be effective in reducing risk of depression following early life adversity.

1. Introduction

An increasing body of research supports the association between early socioeconomic adversity and risk for depression in adolescence and young adulthood (Chapman et al., 2004; Kessler et al., 2010; Patten et al., 2014). In particular, socioeconomic disadvantage, poverty, inadequate housing, and residential instability during early childhood have been linked to later depression (Gilman et al., 2003, 2002). However, little is known about the psychological mechanisms underlying this association (Grant et al., 2006; Grant et al., 2003). Increased knowledge of factors explaining the link between aspects of early socioeconomic adversity and increased risk of depression could provide insights into potentially modifiable targets for intervention.

Depression is a complex disorder and a number of risk factors and causal mechanisms (e.g., psychosocial, neurocognitive, and gene–environment interplay) are likely to be involved (Maughan et al., 2013). Early socioeconomic adversity could exert a direct effect on depression via biological systems, such as the hypothalamic pituitary axis (HPA), and these effects could be independent of exposure to adulthood adversity (Stansfeld et al., 2011). Alternatively, early socioeconomic disadvantage may set off a chain of proximal psychosocial events and individual characteristics that increase the risk for depression, such as adverse family processes (e.g., negative parenting; Conger et al., 2002), environmental stressors (e.g., inadequate schooling; Barrera et al., 2002), and maladaptive coping styles and cognitive attributions (Paschall and Hubbard, 1998). Specifically, exposure to early socioeconomic adversity may lead to a pattern of psychological vulnerability

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characterised by maladaptive perceptions of the self and life events that increase risk for depression (Hammen, 2005). One aspect of psychological vulnerability that could be influential in the link between childhood adversity and depression is adolescents' internal versus external control-related beliefs also known as locus of control (LoC; Rotter, 1966; Strickland, 1989).

It has been argued that an individual's beliefs related to their perceived sense of control over their environment relate to their psychological well-being and mental health outcomes (Chorpita and Barlow, 1998; Shapiro et al., 1993). Individuals are thought to differ in the extent to which they perceive themselves as being able to control life events through their efforts and actions (internal LoC), or that life events are controlled by external forces such as luck, chance and powerful others (external LoC; Rotter, 1966). Although antecedents of LoC in adolescence are not fully understood, it has been suggested that early experiences of adverse and uncontrollable events, including persistent exposure to socioeconomic disadvantage, may foster external LoC orientation characterised by diminished sense of perceived control over one's life and environment (Bryant and Trockel, 1976; Chorpita, 2001; Gilman et al., 2003). Children and adolescents who develop external LoC and experience uncertainty about the extent of control they have over life events have also been hypothesised to be at increased risk of developing depression (Chorpita, 2001; Ostrander and Herman, 2006).

Socioeconomic differences in the sense of personal control have been examined in early cross-sectional studies (Lachman and Weaver, 1998), indicating that those in more disadvantaged groups (characterised by lower income and less education) have lower sense of control and are more likely to believe in the role of external forces and powerful others (Bosma et al., 1999; Lachman and Weaver, 1998). However, longitudinal evidence linking early socioeconomic adversity and adolescent LoC orientation is lacking. Similarly, numerous cross-sectional but few longitudinal studies have examined the link between LoC orientation and depression. Consistently, an external LoC has been found to be associated with depression in childhood (Cole et al., 2001), adolescence (Donnelly, 1999; Muris et al., 2004) and adulthood (Benassi et al., 1988). However, prospective longitudinal studies examining the association between external LoC and depression are limited (Harrow et al., 2009; Frenkel et al., 1995) and further investigations are warranted.

Studies that examine LoC as a possible pathway in the early adversity–depression association are also scarce and not without limitations. The majority of studies are cross-sectional and rely on retrospective assessment of childhood adversity and LoC, thus precluding inferences about the temporal relationship among experiences of adversity, LoC orientation and depression (Deardorff et al., 2003; Kim et al., 1997; Sandler et al., 2000). Furthermore, these studies focus on examining the possible mediating role of LoC in specific samples of children such as those from divorced, bereaved or severely disadvantaged families (Deardorff et al., 2003; Haine et al., 2003; Kim et al., 1997; Sandler et al., 2000). Other limitations include overreliance on measures based on a single reporter (e.g., adolescent self-reports; Kim et al., 1997), composite measures of stress (e.g., total number of various negative life events; Kim et al., 1997), and lack of diagnostic measures of depression (Deardorff et al., 2003). Thus, there is need for prospective studies to examine possible mediating role of LoC in the association between exposure to various aspects of early socioeconomic adversity and depression in young adulthood.

Family adverse experiences are multifaceted and dynamic. Thus, it is important to control for possible confounders whilst examining the pathways among early socioeconomic adversity, LoC and depression in young adulthood. For instance, indices of socioeconomic disadvantage, such as poverty, often co-occur with parental depression and negative parental cognitions (Edwards et al., 2003; Dong et al., 2004), and these events are associated with both development of external LoC orientation and depression in young adulthood. Epidemiological evidence has long established a strong link between socioeconomic disadvantage in childhood and increased risk of a psychiatric disorder, including depression (Solantaus et al., 2004). Paternal depression, like maternal depression, may compromise parenting behaviours and have an adverse impact on the way parents interact with their children (Lyons-Ruth et al., 2002; Paulson et al., 2006) who are more likely to develop external LoC. For instance, aspects of parental cognition, especially maternal warmth and acceptance, have been linked to internal LoC orientation in children and are considered to be antecedents of LoC (Carton and Nowicki, 1996; Muris et al., 2004).

The current study, using data from the Avon Longitudinal Study of Parents and Children (ALSPAC), examines whether LoC mediates the association between early socioeconomic adversity and later depression. It has been previously demonstrated in this cohort that aspects of childhood adversity such as victimisation (e.g., bullying) and harsh parenting are associated with more external LoC orientation (Fisher et al., 2013), and other studies have also reported an association between exposure to socioeconomic adversity and increased risk of depression (Joinson et al., unpublished results). We hypothesised that exposure to socioeconomic adversity from birth to 5 years will be associated with more external LoC orientation at 16 years and that this would constitute an indirect pathway between early adversity and increased risk of depression at 18 years. We used structural equation modelling (SEM) to test the hypothesised model using a latent factor to encapsulate exposure to early socioeconomic adversity during the first 5 years of life, and by adjusting the model for a range of child and parental confounders.

2. Method

2.1. Participants

The sample is comprised of participants from the Avon Longitudinal Study of Parents and Children (ALSPAC), an ongoing UK population-based study. The study website contains details of all data that is available through a searchable data dictionary ⟨http://www.bris.ac.uk/alspac/researchers/data-access/data-dictionary⟩. Ethical approval for the study was obtained from the ALSPAC Ethics and Law Committee and the Local Research Ethics Committees. We restricted our sample to participants recruited during Phase I in order to include covariate information collected during early infancy (this data is not available for Phase II participants). During Phase I enrolment, 14,541 pregnant mothers residing in the former Avon Health Authority in the south-west of England with expected dates of delivery between 1 April 1991 and 31 December 1992 were recruited to the study. These pregnancies resulted in 14,062 live births, of which 13,617 singletons were alive at 1 year of age. For further details on the cohort profile, representativeness and phases of recruitment see Boyd et al. (2013).

2.2. Measures

2.2.1. Exposure: socioeconomic adversity

We used 14 binary indicators derived from questionnaires administered to mothers in the antenatal period and during the first 5 years of the study child's life to derive a normally distributed latent factor of socioeconomic adversity (Fig. 1). The variables assessed in the antenatal period were: maternal educational attainment classified as none/minimal (mothers with the