



Environmental risk factors associated with the persistence of conduct difficulties in children with intellectual disabilities and autistic spectrum disorders



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ABSTRACT

We investigated the association between exposure to environmental risks in early childhood and the prevalence and persistence of conduct difficulties (CD) in children with intellectual disability (ID) who did not have autistic spectrum disorder (ASD), children with ASD and typically developing (TD) children. Results indicated that: (1) exposure to risk was associated with elevated prevalence of CD at age three and, for TD children and children with ID, increased risk of CD persisting to ages five and seven; (2) at all levels of risk, children with ASD were more likely to show persistent CD than other children; (3) children with ID were no more likely to show persistent CD than TD children at low levels of exposure to environmental risk.

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1. Introduction

Children with intellectual or developmental disabilities show markedly higher rates of behavioral difficulties ('challenging' or externalizing problematic behaviors) than their non-disabled peers (Baker et al., 2003; Einfeld, Ellis, & Emerson, 2011; Totsika, Hastings, Emerson, Lancaster, & Berridge, 2011). The presence of such behaviors, especially if persistent over time, can have a detrimental impact on child wellbeing and the wellbeing of siblings and parents (Emerson & Einfeld, 2011).

Behavioral difficulties such as aggression are relatively common in typically developing children, with prevalence reaching a peak at age two to three years after which it reduces markedly (Broidy et al., 2003; Cairns, Cairns, Neckerman, Ferguson, & Gariépy, 1989; Nagin & Tremblay, 1999; Tremblay, 2000, 2006; Tremblay et al., 1999, 2004). While early onset of behavioral difficulties predicts aggression and a range of adverse personal outcomes in later life (Campbell, Shaw, & Gilliom, 2000; Moffitt & Scott, 2008; Tremblay, 1999, 2000, 2006; Tremblay et al., 1999, 2004), outcomes for children who show *persistent* behavioral difficulties across early and middle childhood are particularly poor (Petitclerc & Tremblay, 2009; Tremblay, 2006; Tremblay et al., 2004). As such, there has been a growing interest in identifying personal and environmental

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factors that are associated with different trajectories of behavioral difficulties over time. This body of research has highlighted the importance of the additive or interactive effects of multiple risk factors including: genetic factors; executive dysfunction; temperament; social cognition; and exposure to environmental risk factors such as family poverty, less than optimal parenting practices and neighborhood deprivation (Moffitt & Scott, 2008; Tremblay, 2006, 2012; Tremblay et al., 2004; Vitaro & Tremblay, 2008). It has also led to the development of a range of targeted preventative interventions for children at risk of developing conduct difficulties (Boisjoli, Vitaro, Lacourse, Barker, & Tremblay, 2007; Conduct Problems Prevention Research Group, 2011; Lochman, Wells, Qu, & Chen, 2012; Prinz, Sanders, Shapiro, Whitaker, & Lutzker, 2009; Sanders, 2008; Tremblay, Pagani-Kurtz, Masse, Vitaro, & Pihl, 1995; Vitaro, Barker, Brendgen, & Tremblay, 2012; Webster-Stratton & Taylor, 2001; Webster-Stratton, Reid, & Stoolmiller, 2008; Zubrick et al., 2005).

In contrast, relatively little longitudinal research has been undertaken on the persistence of behavioral difficulties over time in children with intellectual or developmental disabilities. The results of this body of research have drawn attention to the potential importance of a range of factors, with increased persistence being related to: increased severity of intellectual disability (Einfeld et al., 2006; Gray et al., 2012); male gender (Gray et al., 2012); child regulatory strategies (Gerstein, Crnic, Ryu, Baker, & Blacher, 2011); poorer maternal health and wellbeing (Baker, Neece, Fenning, Crnic, & Blacher, 2010; Totsika et al., 2013), although for conflicting results see (Eisenhower, Blacher, & Baker, 2013); family adaptability (Baker, Seltzer, & Greenberg, 2011); parenting (Baker et al., 2010); and, for children with borderline intellectual disability, exposure to environmental disadvantage (Emerson, Einfeld, & Stancliffe, 2011). Interestingly, the latter association was not found in a study of children with autism (Gray et al., 2012).

The aims of the present study are to add to this emerging body of research by examining the relationship between exposure to a range of environmental risk factors at ages nine months and three years and the persistence of conduct difficulties from age three years to ages five and seven in population-based cohorts of British children with intellectual disability or autism spectrum disorder (ASD). We hypothesize that exposure to environmental risk factors at ages nine months and three years will be associated with increased prevalence of behavioral difficulties at age three years and increased persistence of behavioral difficulties from age three to ages five and seven years. We used the Family Stress Model (FSM) (Conger et al., 1992; Conger & Donnellan, 2007) to guide our selection and categorization of indicators of environmental risk factors. The FSM posits that the association between exposure to low socio-economic position (SEP) and the developmental health of children is mediated by the impact of stressors associated with low SEP on the mental health of parents and the relationship quality between parents which in turn has a deleterious impact on parenting behaviors and practices.

2. Method

The study is based on secondary analysis of the first four waves of data collected by the UK's Millennium Cohort Study (MCS). MCS data are managed by the Centre for Longitudinal Studies at the University of London and are available to researchers registered with the Economic and Social Data Service (www.esds.ac.uk) through its data archive (www.data-archive.ac.uk). Full details of the design of MCS are available in a series of reports and technical papers (Hansen, Jones, Joshi, & Budge, 2010; Hansen, 2012; Johnson, 2009, 2012; Jones & Ketende, 2010; Plewis, 2007; Plewis & Ketende, 2006), key aspects of which are summarized below.

2.1. Sampling

Participant families were randomly selected from Child Benefit Records, a non means-tested welfare benefit available to all UK children at the time the cohort was established. Sampling was geographically clustered to include all four countries of the UK (England, Wales, Scotland, Northern Ireland), and disproportionately stratified to over-sample children from ethnic minority groups and disadvantaged communities (Plewis, 2007). Children and families were drawn from 398 randomly selected electoral wards in the UK. The first survey (MCS1) took place when children were nine months old and included a total of 18,552 families. Children were followed up at ages three (MCS2; 15,590 families, 84% retention rate from MCS1), five (MCS3; 15,246 families, 82% retention rate from MCS1) and seven (MCS4; 13,857 families, 75% retention rate from MCS1). For each family, information was collected on the target child falling within the designated birth date window. For multiple births (e.g., twins, triplets) information was collected on all children. To avoid the statistical problems associated with the clustering of multiple births within households, the present analyses are restricted to one randomly selected target child in multiple birth households.

2.2. Identification of children with intellectual disability and autistic spectrum disorder

2.2.1. Intellectual disability

Child cognitive ability was assessed at age three using the Bracken School Readiness Assessment (Bracken, 2002) and Naming Subscale of the British Ability Scales (BAS) (Elliott, Smith, & McCulloch, 1997), selected subscales of the BAS at ages five and seven, and the NFER Progress in Maths test at age seven (Hansen, 2012). For ages five and seven we extracted the first component ('g') from a principle component analysis of all age-standardised subscale/test scores. The first component accounted for 63% of score variance at age seven and 55% of score variance at age five. We identified children as having

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