



## Cumulative exposure to childhood stressors and subsequent psychological distress. An analysis of US panel data



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### ARTICLE INFO

#### Article history:

Received 2 May 2015

Received in revised form

29 July 2015

Accepted 3 August 2015

Available online 6 August 2015

#### Keywords:

Adverse childhood experience

Childhood stressors

Psychological distress

Depression

Socioeconomic

Latent Class Analysis

### ABSTRACT

Research has shown that childhood stress increases the risk of poor mental health later in life. We examined the effect of childhood stressors on psychological distress and self-reported depression in young adulthood. Data were obtained from the Child Development Supplement (CDS) to the national Panel Study of Income Dynamics (PSID), a survey of US families that incorporates data from parents and their children. In 2005 and 2007, the Panel Study of Income Dynamics was supplemented with two waves of Transition into Adulthood (TA) data drawn from a national sample of young adults, 18–23 years old. This study included data from participants in the CDS and the TA ( $n = 2128$ ), children aged 4–13 at baseline. Data on current psychological distress was used as an outcome variable in logistic regressions, calculated as odds ratios (OR) with 95% confidence intervals (CI). Latent Class Analyses were used to identify clusters based on the different childhood stressors. Associations were observed between cumulative exposure to childhood stressors and both psychological distress and self-reported depression. Individuals being exposed to three or more stressors had the highest risk (crude OR for psychological distress: 2.49 (95% CI: 1.16–5.33), crude OR for self-reported depression: 2.07 (95% CI: 1.15–3.71). However, a large part was explained by adolescent depressive symptoms. Findings support the long-term negative impact of cumulative exposure to childhood stress on psychological distress. The important role of adolescent depression in this association also needs to be taken into consideration in future studies.

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### 1. Introduction

Experiences of stressful or traumatic childhood experiences, often referred to as adverse childhood experiences (ACEs), can negatively affect childhood development, and a series of studies, primarily in the field of psychiatry, have shown that ACEs have negative long-term health and social consequences throughout the life course (Anda, 2008; Bellis et al., 2014; Chapman et al., 2004; Green et al., 2010; McLaughlin et al., 2010; Slopen et al., 2014; Wadsworth and Butterworth, 2006). These studies have shown that children exposed to ACEs have increased risk for depression

(Anda, 2008; Chapman et al., 2004; Dube et al., 2003), alcohol abuse (Anda, 2008; Dube et al., 2003), and psychological distress in general (Bellis et al., 2014).

Research has pointed out several explanations for the association between childhood stress and negative health. Evidence from neurobiology suggests that early life stress causes enduring brain dysfunction which, in turn, affects health and quality of life throughout the lifespan (Anda, 2008). This is congruent with the allostatic load theory, suggesting that the neurobiological stress management systems can be permanently altered by cumulative or chronic stress in childhood (Beckie, 2012; McEwen, 2004). Psychological and psychosocial explanations on the other hand suggest that childhood adversity may damage emotional regulation and concept of self-worth, reducing the child's self-esteem (Wadsworth and Butterworth, 2006), leading to an increased vulnerability for psychological distress. Another discussed explanation for the

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relationship is that the physical or mental illness in childhood may precede the childhood stressors (e.g. marital distress or financial problem) that in turn lead to health problems in young adulthood (Corman and Kaestner, 1992).

Prior research has shown that people from disadvantaged family backgrounds are more likely to accumulate risk factors associated with subsequent health problems, compared to peers born to more privileged families (Anda, 2008; Halldorsson et al., 2000; Kuh et al., 2004; McMunn et al., 2001).

A life course approach offers a framework for studying long-term health effects of physical or social exposures during gestation, childhood, adolescence, young adulthood and later adult life (Kuh et al., 2003; Lynch and Smith, 2005). It emphasizes the importance of time and timing in understanding the causal links between exposure and outcome (Lynch and Smith, 2005). There are several hypotheses on how the effect of exposure can be linked to health-related outcomes. Accumulation of risks over the life span has been suggested as one etiologic pathway to persistent health problems (Kuh et al., 2003). Risk factors in childhood tend to occur in clusters, rather than as single events or experiences (Anda, 2008; Björkenstam et al., 2013; Dong et al., 2004), and have a strong positive association with psychiatric and psychological distress (Anda, 2008; Björkenstam et al., 2013; Chapman et al., 2004; Dube et al., 2003; Slopen et al., 2014). Although much is already known about childhood stressors and the risk for future adverse health, less is known on what clusters of stressors are most closely associated with subsequent distress.

The current study uses data from the Panel Study of Income Dynamics (PSID) to examine the association between cumulative exposure to childhood stressors, and risk of psychological distress in early adulthood. The studied indicators of childhood stress were parental death, single parent household, fair or poor self-rated health in childhood, multiple school changes during the school year, teenage parenthood, household public assistance reciprocity, and long-term parental unemployment. The indicators chosen were based on prior research that has shown them to have significant adverse health or social implications (Berg et al., 2014; Conger et al., 1993; Duncan and Brooks-Gunn, 1997; Halldorsson et al., 2000; Hodgkinson et al., 2014; Kuh et al., 2004; Sleskova et al., 2006; Wadsworth and Butterworth, 2006; Weitoft et al., 2003; Wood et al., 1993).

We seek to answer the following research questions:

- Is there an association between cumulative exposure to childhood stressors and psychological distress in young adulthood in a large nationally-representative US sample?
- What clusters of childhood stressors are most closely associated with future psychological distress?

## 2. Methods

### 2.1. Study population

We used data from the three waves of the Child Development Supplement (CDS-I through CDS-III) and the four waves of the Transition into Adulthood (TA) surveys from the Panel Study of Income Dynamics (PSID). The PSID is a longitudinal study that began in 1968 with a nationally representative sample of about 5000 families in the United States, with an oversampling of African American and low-income families (McGonagle et al., 2012). The household heads (defined by PSID as the person, at least 16 years old, with the most financial responsibility in the household) were reinterviewed annually until 1997 and every other year thereafter.

In 1997, the PSID began collecting data on a random sample of

the PSID families that had children under the age of 13 in the Child Development Study (CDS)-I. The CDS was designed as a nationally representative sample of children in the United States (McGonagle and Sastry, 2014; McGonagle et al., 2012). All PSID families with a child aged 0–12 in the calendar year 1997 were invited to participate, with up to two chosen children per family. Subsequent waves of interviews were carried out in 2002–2003 and 2007–2008, in each case including only children who still were under the age of 18 at the time of the study wave. Most information in the CDS is collected from the participant's primary caregiver, who must be living with the child. In over 90% this is the child's biological mother. The children are also interviewed. The entire CDS sample size in 1997 is approximately 3500 children residing in 2400 households. A follow-up study with these children and families was conducted in 2002–03 (CDS-II), and another one in 2007–2008 (CDS-III). No new children were included in CDS-II and CDS-III.

In 2005, another supplementary study to the PSID was introduced, the Transition to Adulthood (TA) study (Institute for Social Research). The TA component comprises young adults who were children in the CDS and subsequently turned 18. These former children themselves answer all questions in the TA. The TA data have been collected every other year since 2005, with a final wave planned for 2015 (McGonagle and Sastry, 2014).

The sample used in this study combined data from all three waves of the CDS, and all four available waves of the TA. Our sample included 2128 individuals, born between 1984 and 1993, who participated in the first CDS and at least in one of the TA. Of these individuals, 88% were reinterviewed in CDS-II, and 36% in CDS-III (due to the fact that when the child turned 18, she/he were no longer eligible to answer the CDS) (for additional information on data missingness, see Supplementary Table 1).

### 2.2. Exposure: childhood stressors

The studied indicators are principally based on questions answered by the primary care givers (PCGs) or other care givers (OCG). We used questions asked when the children were between the ages of 4 and 14. Thus, we used CDS 1997 for all participants (during this year children were between the ages of 4 and 13), CDS 2002 for participants born between 1988 and 1993 (children were between the ages of 9 and 14) and CDS 2007 for those born in 1993 (children were 14 years old). Supplementary Table 2 illustrates which waves were used for the different birth cohorts. Additionally, the original PSID studies were used to obtain information household public assistance reciprocity and long-term parental unemployment (see below).

To assess cumulative exposure to the studied indicators, the total number was summed. For each indicator, ever reporting an indicator during any interview was considered one exposure.

**Parental death:** Death of a parent is a traumatic life event that is likely to increase stress levels in children (Berg et al., 2014). Captured from the three waves of the CDS, the PCGs were asked if the child's biological mother and father were still alive. This indicator was coded as 1 if one or both parents died and 0 otherwise.

**Single parent household:** Growing up in a single parent family has become increasingly common, and it may entail disadvantages for the child in terms of socioeconomic circumstances and health (Weitoft et al., 2003). In the CDS, the PCGs were asked whether the child was living with both parents and, if not, which parent he/she was living with. If the child was living with only one parent at the time of the interview this indicator was coded as 1.

**Fair or poor self-rated health in childhood:** Poor child health is often associated with childhood adversity in terms of poverty and family economic adversity (Duncan and Brooks-Gunn, 1997). The PCGs were asked about the child's health in general, based on the

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