Research article

The role of timing of maltreatment and child intelligence in pathways to low symptoms of depression and anxiety in adolescence

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\section*{ABSTRACT}

Research indicates that childhood maltreatment is strongly associated with high levels of adolescent depression and anxiety symptoms. Using LONGSCAN data and taking into account the range of family characteristics related to adversity (poverty, primary caregiver substance abuse) and protective factors (living with biological mother and father), the present study assessed the complex resilience process in which child intelligence (age 6) mediated the relationship between early childhood maltreatment (age 0–4) and adolescent symptoms of depression and anxiety (age 14). We also assessed if mid (age 6–8) and late (age 10–12) childhood maltreatment moderated this mediation. We found that mid-childhood intelligence mediated the negative effect of early childhood maltreatment (age 0–4) on anxiety symptoms (age 14), but not on depressive symptoms (age 14). We also found the effect of timing of maltreatment: early childhood maltreatment (age 0–4) predicted more anxiety symptoms in adolescence, whereas late childhood/early adolescent (age 10–12) maltreatment predicted more symptoms of depression in adolescence. In addition, mid (age 6–8) and late (age 10–12) childhood maltreatment dampened the protective effect of IQ (age 6) against anxiety (age 14). In sum, current evidence shows that low anxiety and depression symptoms in adolescence following childhood maltreatment was achieved through different pathways, and that early and late childhood/early adolescence were more sensitive periods for development of psychopathology related to depression and anxiety in adolescence.

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\section*{Introduction}

Research has highlighted the many adverse psychological outcomes resulting from childhood maltreatment, particularly increased symptoms of depression and anxiety. However, not all maltreated children experience symptoms of depression and anxiety despite their high-risk status (McGloin & Widom, 2001). Studies exploring resilience to maltreatment (for review see Young, Abelson, Curtis, & Nesse, 1997) focus on social support and coping skills (Runtz & Schallow, 1997); less is known about the role of intelligence and maltreatment timing. This study aims to fill this gap using large longitudinal data to assess the impact of maltreatment timing on adolescent symptoms of depression and anxiety, and to test empirically a model in

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which intelligence is conceptualized as a major resilience factor to adolescent depression and anxiety symptoms following child maltreatment.

**Child Maltreatment: Prevalence, Predictors and Gender Differences**

Stoltenborgh, Bakermans-Kranenburg, Alink, and Ijzendoorn (2014) reported gender differences between types of maltreatment worldwide: 7.6% of males and 18% of females reported sexual abuse, and 22.6% of males and 36.3% of females reported physical and emotional abuse. Differences in psychological outcomes following maltreatment have also been reported; numerous studies have found females to be at a higher risk than males for developing depression following maltreatment (Thompson, Kingree, & Desai, 2004). Furthermore, gender differences have been reported in the factors mediating the relationship between childhood maltreatment and adolescent outcomes. For example, Jaffee, Caspi, Moffitt, Polo-Tomás, and Taylor (2007) found that above-average IQ was linked with resilient functioning (defined by low levels of anti-social behavior) for maltreated boys but not girls. Based on these reported gender differences in maltreatment rates, psychological outcomes and resilience factors, the present study will test the proposed model in the whole sample as well as in the samples of boys and girls separately, to establish if gender differences exist in pathways to resilient functioning following maltreatment.

Co-occurrence of multiple maltreatment types in the general population is common, with reported rates ranging from 3% to 55% in the U.S. (Edwards, Holden, Felitti, & Anda, 2003). Validating maltreatment claims is problematic: only 1% of youths across high-income countries, including the U.S. and Canada, have substantiated maltreatment claims (Gilbert et al., 2009). Considering substantiation issues and high rates of co-occurrence of maltreatment types, this study will include data on alleged and substantiated cases, and will use an indicator combining all types of maltreatment at early, mid and late childhood.

Children from a low socioeconomic status and dysfunctional family background are more likely to experience maltreatment (Scott, 2009), often in multiple forms (Denholm, Power, Li, & Thomas, 2013). Accumulation of maltreatment, family dysfunction and poverty are associated with increased severity of adverse outcomes (Briggs-Gowan et al., 2010). Low maternal education (Kotch, Browne, Dufort, Winsor, & Catellier, 1999), single-parenthood (National Center on Child Abuse and Neglect, 1981), non-biological caregivers in the home (Wilson & Daly, 2005) and parental substance abuse (Kotch et al., 1999) were also linked with increased risk of maltreatment. Following Briggs-Gowan et al’s (2010) suggestion that understanding the role of cumulative childhood adversity is important for establishing its impact on outcomes in adolescence, we included indicators of family background and low socioeconomic status in our model.

**Adolescent Depression and Anxiety Symptoms as a Consequence of Child Maltreatment**

Maltreatment has been consistently linked with increased affective disorders in adolescence; rates of minor depression, anxiety disorders and major depression during adolescence were higher in maltreated youths (37%, 26%, 20%, respectively) than controls (3%, 4%, 3%, respectively) (Collishaw et al., 2007), and more maltreated (52%) than nonmaltreated (40%) individuals displayed symptoms of depressive or anxiety disorders (McGloin & Widom, 2001). Depression has been identified as one of the most common sequelae of maltreatment (Spinhoven et al., 2010), and numerous studies have found strong predictive links between maltreatment and depression and anxiety (Scott, Smith, & Ellis, 2010).

The literature suggests that early life trauma exposure may sensitize young children and place them at risk for internalizing problems when exposed to subsequent, nontraumatic life stressors (Briggs-Gowan et al., 2010; Grasso, Ford, & Briggs-Gowan, 2013). Evidence from research in neuroscience indicates that increased risk of psychopathology following maltreatment is caused through changes in the functioning and structure of the brain (Teicher, Andersen, Polcari, Anderson, & Navalta, 2002; Van Harmelen et al., 2014) as well as by altered neurohormonal responses to stress when encountered in later life (Grasso et al., 2013). Early adolescence is a critical period for brain development as it undergoes significant remodeling and hormonal changes with the onset of puberty (Forbes & Dahl, 2010). These changes confer a vulnerability to depression (Crews, He, & Hodge, 2007) particularly when coupled with extreme stress and trauma (Andersen & Teicher, 2008).

**Resilience as an Individual’s Agency: The Role of Intelligence**

Jaffee and colleagues (2007) found that 12–22% of individuals with a history of maltreatment were resilient to psychopathology, while McGloin and Widom (2001) asserted that 48% of maltreated individuals have no current or lifetime psychiatric disorder. DuMont, Widom, and Czaja (2007) found 53% of participants to be free from a mental illness. These studies, however, focused mainly on outcome – resilient functioning defined as the lack of psychiatric diagnosis or disabling psychopathology (Cicchetti & Rogosch, 2001). In this study we focus on the process and mechanisms of resilience to depression and anxiety symptoms rather than on outcome exclusively. Bandura (2006) argued that humans are capable of transcending their experiences in order to intentionally influence the course of their lives. The ability to act as a mindful agent is particularly related to cognitive ability (Bandura, 2006); research has identified “agency promoting” factors that mitigate the effect of maltreatment on later experiences of anxiety and depression, including above-average intelligence (Jaffee et al., 2007). Rogeness, Amrung, Macedo, Harris, and Fisher (1986) found low IQ to be linked to depression and anxiety.
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