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Research article

# Conditional and indirect effects of age of first exposure on PTSD symptoms



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## ABSTRACT

Childhood violence exposure (CVE) in formative developmental years may have potent effects on severity and complexity of post-traumatic stress symptoms (PTSS) in adulthood, yet little research has examined the role of age of first exposure in the context of polyvictimization or gone beyond an examination of direct effects. The current study examines the specific associations between age of first exposure, total CVE, and posttraumatic stress symptoms in adulthood. Further, the conditional and indirect effects of age of first exposure on posttraumatic stress symptoms were examined. We hypothesized that age of first exposure to violence would be associated with higher total violence exposure across childhood, thereby predicting current posttraumatic stress symptom severity (i.e., indirect effect). We also postulated that age of first exposure would affect the relationship between total violence exposure and posttraumatic stress symptoms such that earlier exposure would exacerbate the effects of violence exposure (i.e., conditional effect). Participants included 269 violence-exposed adults recruited through MTurk; the mean age of first CVE was 6 years ( $SD = 3.29$ ). Conditional process models indicated that age of first exposure was significantly associated with higher total childhood violence exposure, which in turn, was significantly associated with current posttraumatic stress symptoms in all domains. Further, a conditional effect of age of first exposure was present such that the relationship between total exposure to violence and symptoms of hyperarousal was stronger for those first exposed at earlier ages. Findings provide support suggesting the particular potency of early trauma on regulatory response systems.

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Rates of childhood violence exposure (CVE) in the United States are astonishingly high, with 71% of individuals reporting at least one type of violence exposure before the age of 18 (Finkelhor, Turner, Ormrod, & Hamby, 2009). Unfortunately, those exposed to traumatic events are likely to report multiple exposures (Kessler, 2000), and those who report multiple types of exposure (e.g., both sexual assault and exposure to intimate partner violence) – also referred to as *polyvictims* – are most likely to experience negative outcomes (Finkelhor, Ormrod, & Turner, 2007a, 2007b). Commonly reported short-term negative effects of CVE include internalizing and externalizing behavior problems, posttraumatic stress symptoms, physiological dysregulation, and cognitive and attentional difficulties (Chan & Yeung, 2009; Graham-Bermann, Howell, Miller, Kwek, & Lilly, 2010; Miller, 2014; Margolin & Gordis, 2000; Yates, Dodds, Sroufe, & Egeland, 2003). Adults with a history of CVE report higher levels of anxiety, depression, posttraumatic stress, health risk behaviors, physical health problems, and suicide

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attempts (Miller-Graff, Cater, Howell, & Graham-Bermann, 2015; Dube, Felitti, Dong, Giles, & Anda, 2003). Beyond the long-term negative mental health ramifications, CVE is also significantly associated with violent re-victimization in adulthood (Arata, 2002; Holliday, Clem, Woon, & Suris, 2014; Messman & Long, 1996; Whitfield, Anda, Dube, & Felitti, 2003; Wisdom, Czaja, & Dutton, 2008).

### The Importance of Assessing Polyvictimization

The long-term effects of CVE are particularly potent for polyvictims, suggesting the need for comprehensive assessments of CVE. Much recent theoretical and empirical work has demonstrated that children's risk for exposure is frequently "bundled" (e.g., Finkelhor, Turner, Hamby, & Ormrod, 2011; Finkelhor et al., 2007a, 2007b; Hamby & Grych, 2013). That is, exposure to multiple types of violence is common and assessing only a single type of exposure is likely to result in an incomplete understanding of children's risk profiles. A comprehensive assessment of CVE is also advantageous when determining developmental risk patterns as the type and timing of exposures may vary considerably (Finkelhor, Ormrod, Turner, & Hamby, 2005). For example, maltreatment tends to have relatively early onset, while physical assaults peak in middle childhood and sexual victimization increases as children age into adolescence (Finkelhor et al., 2005). Although there is relative consensus that earlier exposures are potentially more deleterious than later exposures most evaluations of the contributing role of age of first exposure have focused on maltreatment (e.g., Kaplow & Widom, 2007; Kaplow, Dodge, Amaya-Jackson, & Saxe, 2005; Slopen, McLaughlin, Dunn, & Koenen, 2013; Tarullo & Gunnar, 2006). Despite the fact that maltreatment may occur early in life and is a strong predictor of maladaptive developmental outcomes, many children living in high risk homes are also exposed to other forms of violence, such as intimate partner violence, as newborns and infants (Graham-Bermann & Perkins, 2010). As such, there is a pressing need for research to examine the effects of age of first exposure that fully accounts for the onset of a broad range of types of violence exposure that may occur in childhood.

### Explanations for the Potency of Early Victimization

There are several theories that have been put forward to explain the particular potency of early exposure to violence. Some researchers have hypothesized that early exposure to violence overwhelms children's coping capacities, resulting in long-term decrements in this domain and increasing vulnerability to stress (Contractor et al., 2013; Kaplow et al., 2005). There is also evidence to suggest that early exposure to violence may alter children's cognitive and attentional bias to threatening stimuli heightening long-term vulnerabilities to anxiety and posttraumatic stress symptoms (Miller, 2014; Swartz, Graham-Bermann, Mogg, Bradley, & Monk, 2011). Early exposure to violence also appears to have detrimental effects on children's physiology, negatively impacting a number of critical biological systems that regulate stress, attention, resilience and even immune functioning (Caspi et al., 2002; Perry, 2001; Shin, Rauch, & Pitman, 2006; Slopen et al., 2013; Tarullo & Gunnar, 2006). Overall, research suggests that early exposure to violence heightens lifespan vulnerability by interfering with the healthy development of natural regulatory and coping systems. Because these systems are naturally more plastic in developing children, it is thought that early interference may cause significantly more damage than a similar assault on adult coping and regulatory systems (Tarullo & Gunnar, 2006).

Several studies have examined the effect of early exposure on posttraumatic stress symptom (PTSS) severity. Some studies show that exposure in pre-adolescence and early adolescence is associated with higher concurrent levels of PTSS than exposure in later adolescence (Giannopoulou et al., 2006; Kar et al., 2007). Other studies of older children and adolescents, however, have shown the opposite effect (Ayer et al., 2011; Copeland, Keeler, Angold, & Costello, 2007; Kaplow et al., 2005). One of the only studies assessing the contributing role of age of first exposure from childhood into adulthood considered sexually abused children and found that earlier exposure, assessed either continuously or by developmental epoch, is associated with higher levels of PTSS in adulthood (Kaplow & Widom, 2007). Similarly, early exposure to violence predicts a wide range of other emotional and behavioral problems, including low self-esteem (Bolger, Patterson, & Kupersmidt, 1998), behavioral problems (Kaplow & Widom, 2007), and anxiety and depression (Kaplow et al., 2005).

Although there is support for the hypothesis that violence exposure is particularly toxic in early childhood due to inherent developmental vulnerabilities, surprisingly little research has gone beyond the examination of direct effects to consider how age of first exposure might trigger and interact with other types of risk including in how it may *indirectly* affect functioning through a heightened risk for polyvictimization and how it might *conditionally* impact the relationship between cumulative victimization and symptom presentation due to deficits related to early exposure.

#### *Indirect Risk Pathway*

In one nationally representative study of children reported for maltreatment before the age of 4, 67% were re-reported within the next eight years (Proctor et al., 2012). Although this study did not explicitly evaluate the predictive role of age of onset, consequent theoretical work has evaluated and supported pathways to polyvictimization that link past victimizations to risk for future victimizations through persistent intrapersonal, familial, and neighborhood risk (Finkelhor et al., 2011). In one longitudinal study, children's past year polyvictimization at the first assessment was a significant predictor of polyvictimization in the following year (Finkelhor et al., 2007a, 2007b). Further, this study found that exposure to one type of victimization increased children's vulnerability to other types of victimizations. Here, persistence of polyvictimization

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