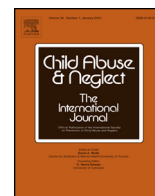


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# Child Abuse & Neglect



## Impulsivity as a moderator of the associations between child maltreatment types and body mass index



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### ABSTRACT

Child maltreatment has emerged as an important risk factor for adult obesity (Danese & Tan, 2014; Hemmingsson et al., 2014). However, there is a need for research delineating the factors that play a role in this association. Impulsivity has been shown to be associated with both child maltreatment (Brodsky et al., 2001) and body mass index (BMI; Cortese et al., 2008; Thamotharan et al., 2013). Further, given previous research showing that adverse events interact with impulsivity to predict hazardous drinking behaviors (Fox et al., 2010), there is reason to hypothesize that child maltreatment might interact with impulsivity to predict other adverse health outcomes, such as elevated BMI. Accordingly, the current study examined whether impulsivity moderated the association between child maltreatment types (i.e., physical abuse, physical neglect, sexual abuse, emotional abuse, and emotional neglect) and BMI. The sample was comprised of 500 undergraduate students (49.6% male) between the ages of 18 and 25 years. Regression analyses suggested that maltreatment types and impulsivity were not uniquely associated with BMI. However, impulsivity moderated the association between childhood sexual abuse and adult BMI, such that BMI was highest at high levels of both sexual abuse and impulsivity. Impulsivity did not moderate the associations between the other child maltreatment types and BMI. Limitations, future directions, and clinical implications of this research are discussed.

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Child maltreatment is a multifaceted and heterogeneous public health problem that has been the focus of considerable research and debate over many decades (e.g., Barnett, Manly, & Cicchetti, 1991; Gilbert et al., 2009; Lewis, McElroy, Harlaar, & Runyan, 2016). Although the knowledge acquired from such efforts is far from complete, the existing evidence has made a substantial contribution to the understanding of child maltreatment by identifying many of its causes and consequences (e.g., Gilbert et al., 2009; Munro, Taylor, & Bradbury-Jones, 2014). For example, researchers have consistently documented that child maltreatment is a risk factor for a host of mental and physical health problems, including substance use and abuse (Dube et al., 2006; Lo & Cheng, 2007), internalizing symptoms (Brown, Fite, Stone, & Bortolato, 2016; Gilbert et al., 2009), externalizing symptoms (Gilbert et al., 2009; Richey, Brown, Fite, & Bortolato, 2016), eating disorders (Fosse & Holen, 2006), and obesity (Danese & Tan, 2014).

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With regard to obesity, although some research indicates a link between child maltreatment and BMI among youth (e.g., Keeshin et al., 2013), a recent meta-analysis concluded that overall, child maltreatment is not associated with child and adolescent obesity (Danese & Tan, 2014). In contrast, several systematic reviews and meta-analyses found that child maltreatment is associated with elevated risk for obesity in adulthood (Danese & Tan, 2014; Hemmingsson, Johansson, & Reynisdottir, 2014). Although some continuity exists between adolescence and emerging adulthood, there are challenges that are unique to each developmental period (Arnett, 2007). For example, emerging adulthood is characterized by developmental transitions (e.g., college, marriage, and full-time employment), and theorists have suggested that identity development and exploration is most critical during the emerging adult years (Arnett, 2005, 2007). Additionally, there seems to be gradual, biological processes that occur in the aftermath of childhood maltreatment that are associated with a progressive increase in BMI over time (Danese & Tan, 2014). These developmental transitions and processes might help explain why researchers have posited that the consequences associated with child maltreatment might become salient during emerging adulthood (Wright, Crawford, & Del Castillo, 2009).

Despite this assertion, there is a lack of research examining how child maltreatment might contribute to obesity during emerging adulthood, although preliminary evidence suggests that emotional abuse, sexual abuse, and physical neglect are associated with BMI and eating or weight problems among emerging adults (Johnson, Cohen, Kasen, & Brook, 2002; Roenholdt, Beck, Karsberg, & Elklit, 2012). Existing evidence in this area is further limited by an exclusive focus on one or two maltreatment types (e.g., sexual abuse alone or sexual abuse and physical abuse) or use of a total maltreatment score (Danese & Tan, 2014). Given evidence indicating that maltreatment types are differentially linked to outcomes (Brown et al., 2016; Connor, Steingard, Cunningham, Anderson, & Melloni, 2004; van Veen et al., 2013), more research is needed to elucidate how exposure to different maltreatment types might uniquely impact BMI.

Finally, researchers have called for studies examining factors, including impulsivity, which might mediate or moderate the associations between child maltreatment types and obesity in emerging adulthood (Shin & Miller, 2012). The current study responds to this call and contributes to the existing literature by empirically examining whether impulsivity might moderate the associations between child maltreatment types and BMI among emerging adults.

## 1. Child maltreatment and BMI

The existing empirical evidence yields strong support for the association between child maltreatment and BMI, with researchers suggesting that this link might be explained by increased inflammation (Danese & Tan, 2014; Hepgul et al., 2012; Rohde et al., 2008). Specifically, psychosocial stressors, such as child maltreatment, have been linked to heightened inflammatory activity (e.g., higher levels of C-reactive protein), an important correlate of obesity (Choi, Joseph, & Pilote, 2013; Hepgul et al., 2012). Thus, it is no surprise that researchers have consistently shown that child maltreatment predicts adult BMI and obesity (Aaron & Hughes, 2007; Boynton-Jarrett, Rosenberg, Palmer, Boggs, & Wise, 2012; Greenfield & Marks, 2009). For example, Rohde et al. (2008) examined associations between child maltreatment, obesity, and depression in a sample of middle-aged women and found that exposure to child maltreatment (i.e., sexual and physical abuse) was associated with a twofold increase in the risk of obesity. These findings have been reinforced by subsequent research demonstrating that individuals with maltreatment histories were more likely to be obese than those who did not report such experiences (Greenfield & Marks, 2009; Helton & Liechty, 2014; Nagl, Steinig, Klinitzke, Stepan, & Kersting, 2015; Williamson, Thompson, Anda, Dietz, & Felitti, 2002).

Despite consensus that child maltreatment is a risk factor for adult obesity (Danese & Tan, 2014; Helton & Liechty, 2014; Shin & Miller, 2012), no studies have examined the differential associations between all five maltreatment types and BMI among emerging adults. Among adult samples, findings are inconsistent with regard to the specificity of maltreatment effects (Midei, Matthews, & Bromberger, 2010; Pederson & Wilson, 2009; Thomas, Hyppönen, & Power, 2008; van Reedt Dortland, Giltay, van Veen, Zitman, & Penninx, 2012). For example, Midei et al. (2010) found that only physical and sexual abuse were associated with BMI among middle-aged women. Pederson and Wilson (2009) found that severity of emotional abuse and emotional neglect, but not severity of physical abuse, physical neglect, and sexual abuse, were associated with adult BMI among women between the ages of 19 and 49 years. However, after controlling for the severity of other maltreatment types, only the severity of emotional neglect was significantly associated with BMI. These mixed results highlight the need for further research examining the specificity of the associations between different maltreatment types and BMI, particularly among emerging adults, as such research might yield important implications for prevention and intervention efforts.

## 2. The moderating role of impulsivity

Impulsivity, a personality trait or cognitive style characterized by behavioral disinhibition, includes a tendency to respond quickly without much planning or forethought (Brodsky et al., 2001; Patton, Stanford, & Barratt, 1995). There are several reasons to postulate that impulsivity might moderate the association between child maltreatment and BMI. Guided by the toxic stress framework, child maltreatment might lead to prolonged activation of the stress response system, which is associated with increased risk of stress-related disorders, including obesity (Shonkoff, 2010; Sinha & Jastreboff, 2013). This process might be moderated by executive functions, such as impulse control.

The empirical literature supports this theory as research indicates that adults with maltreatment histories report higher levels of impulsivity than adults who deny such experiences (Brodsky et al., 2001), with research suggesting that all five

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