



Experiential avoidance and the relationship between child maltreatment and PTSD symptoms: Preliminary evidence[☆]

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ABSTRACT

Objective: Not every adolescent exposed to child maltreatment develops symptoms of post-traumatic stress disorder (PTSD), emphasizing the need to identify variables that explain how some maltreated children come to develop these symptoms. This study tested whether a set of variables, respiratory sinus arrhythmia (RSA) and cortisol reactivity as well as experiential avoidance, explained the relationship between child maltreatment and PTSD symptoms.

Methods: Adolescent females ($N=110$; $n=51$ maltreated) 14–19 years of age completed interviews, questionnaires, and a stressor paradigm. A multiple mediator model was used to assess the effect for the set of variables while identifying specific indirect effects for each variable.

Results: Results indicated that the set of variables mediated the relationship between child maltreatment and PTSD symptoms. However, only experiential avoidance contributed significantly to this effect when simultaneously estimating all other variables. The indirect effect for experiential avoidance was also significantly stronger than the effects of RSA and cortisol reactivity.

Conclusions: Data support the examination of experiential avoidance in understanding how adolescents who have been maltreated develop PTSD symptoms with implications for prevention and intervention.

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Child maltreatment, including physical abuse, sexual abuse, and neglect, is one of the most consistent predictors of posttraumatic stress disorder (PTSD) symptoms. Literature reviews (Brown, 2003; Kendall-Tackett, Williams, & Finkelhor, 1993), meta-analyses (Chen et al., 2010; Paolucci, Genuis, & Violato, 2001), as well as epidemiological (Duncan, Saunders, Kilpatrick, Hanson, & Resnick, 1996; Kilpatrick et al., 2003) and cross-cultural studies (Kessler et al., 2010) have all shown a direct link between child maltreatment and PTSD. However, not every maltreated child develops PTSD or PTSD symptoms (Copeland, Keeler, Angold, & Costello, 2007), suggesting that additional mediating variables may explain how maltreatment leads to PTSD symptoms.

Toward this end, researchers have given considerable attention to identifying biomarkers of risk that would explain the link between child maltreatment and PTSD. The autonomic nervous system (ANS) and hypothalamic-pituitary-adrenal (HPA) axis have been targeted predominantly because they are the two main physiological systems activated during environmental stress. Briefly, in healthy individuals the sympathetic branch of the ANS is activated through the locus coeruleus which

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elevates production of norepinephrine and stimulates the adrenal medulla to release epinephrine. Catecholamines such as norepinephrine and epinephrine are ultimately responsible for increasing blood glucose, heart rate, and blood pressure that aid the body in resolving a stressor (Cacioppo, 1994). Parasympathetic influence over cardiac activity, which is responsible for modulating increased sympathetic activity through the hypothalamus and amygdala, often withdraws during stressor situations to facilitate the sympathetic response and promote resolution of the stressor (Porges, 2003). Activation of the HPA axis begins when a stressor stimulates the corticotrophin-releasing hormone (CRH) in the hypothalamus, leading to secretion of the adrenocorticotropic hormone (ACTH) in the anterior pituitary, and resulting in increased concentrations of cortisol produced by the adrenal cortex (Chrousos & Gold, 1992). When the stressor is resolved, the hypothalamus and anterior pituitary regulate cortisol concentrations by suppressing production of CRH and ACTH in a process known as the negative-feedback loop (Munck, Guyre, & Holbrook, 1984). Despite being separate arms of the body's stress response, the ANS and HPA are both designed to assist the individual under stressful conditions, are influenced by similar brain structures and contain regulatory capacities that modulate heightened physiological activity.

Child maltreatment has been linked to disrupted profiles of ANS and HPA axis activity, including significantly higher and lower estimates at rest and during stress reactivity paradigms, when compared to non-maltreated controls. For instance, child maltreatment is related to disruptions in the respiratory sinus arrhythmia (RSA), an index of parasympathetic control, at rest (Hopper, Spinazzola, Simpson, & van der Kolk, 2006; Miskovic, Schmidt, Georgiades, Boyle, & MacMillan, 2009) and under stress (Dale et al., 2009) with disruptions in RSA predictive of PTSD symptoms (Blechert, Michael, Grossman, Lajtman, & Wilhelm, 2007; Keary, Hughes, & Palmieri, 2009). Child maltreatment has also been linked to disruptions in cortisol activity, an indicator of HPA axis functioning, at rest (Cicchetti & Rogosch, 2001; King, Mandansky, King, Fletcher, & Brewer, 2001) and during chemical or laboratory stress paradigms (Carpenter et al., 2007; Hart, Gunnar, & Cicchetti, 1995; Heim et al., 2000), each of which have been linked to PTSD symptoms (Carrion et al., 2002; Santa Ana et al., 2006). However, research on disruptions in biomarker profiles in maltreated samples varies across developmental stages (Trickett, Noll, Susman, Shenk, & Putnam, 2010). Thus, studying a single developmental stage while controlling for confounding variables such as how recent the abuse occurred and the time of day biomarkers are sampled will strengthen inferences made about the role of physiological processes in eliciting PTSD symptoms.

Psychological processes represent mediational pathways that explain how an event, such as child maltreatment, exerts its effect on a particular psychological outcome while also identifying key targets for clinical intervention. One such process, experiential avoidance, has gained considerable attention recently as it has been linked to a number of different psychological outcomes (Aldao, Nolen-Hoeksema, & Schweizer, 2010). Experiential avoidance involves an unwillingness to experience painful or aversive private events, such as unwanted thoughts, emotions, memories, and physiology, with attempts to control, suppress or inhibit the form or frequency of these private events and the contexts that occasion them (Hayes, Wilson, Gifford, Follette, & Strosahl, 1996). This process may play a particularly important role in promoting the development of PTSD symptoms in children who have been maltreated. Maltreatment, like other forms of trauma, can prompt painful private events, such as re-occurring images or recollections of the event, heightened physiological states, and increased fear and anxiety. Coming into contact with these events may generate attempts to alter, suppress or otherwise control their form or frequency so that the aversiveness of the experience can be reduced. This can establish the use of avoidance strategies, a key symptom cluster of PTSD, while actually maintaining or increasing other PTSD symptoms (Cameron, Palm, & Follette, 2010; Rosenthal, Cheavens, Lynch, & Follette, 2006). Maltreated children commonly using avoidance strategies, including avoiding conversations about the abuse or subsequent private events, may actually prevent the experiencing and processing of the abuse that is central to the recovery from and treatment of child trauma (Cohen, Mannarino, & Deblinger, 2006) and PTSD (Foa & Rothbaum, 1998).

Child maltreatment has indeed been related to higher levels of experiential avoidance (Gratz, Bornova, Delany-Brumsey, Nick, & Lejuez, 2007; Sullivan, Meese, Swan, Mazure, & Snow, 2005) which in turn has predicted the development of PTSD symptoms above and beyond initial symptom severity (Plumb, Orsillo, & Luterek, 2004). Moreover, experiential avoidance has demonstrated mediation between child maltreatment and several different psychological outcomes (Marx & Sloan, 2002; Polusny, Rosenthal, Aban, & Follette, 2004). Thus, avoidance may play a key role in PTSD symptom development for maltreated individuals and explain how some of these individuals eventually develop PTSD symptoms when others do not. However, most of the research to date has been conducted with adult samples and an important area for future research is to extend this model of experiential avoidance to adolescents who have recently been maltreated and are experiencing PTSD symptoms.

Recent efforts explicating biobehavioral pathways to psychopathology have called for the simultaneous assessment of multiple physiological systems as opposed to a single system approach (Bauer, Quas, & Boyce, 2002). Furthermore, physiological and psychological processes co-occur and no study to date has tested whether a set of these processes mediates the relationship between child maltreatment and PTSD symptoms in the same statistical model. Thus, this study aims to test: (1) whether RSA reactivity, HPA axis reactivity and experiential avoidance mediates the relationship between child maltreatment and PTSD symptoms, (2) whether any specific indirect effect contributes significantly to a total indirect effect, and (3) whether the indirect effects of any one variable is superior when compared to the indirect effects of the other variables in the model. It was hypothesized that the set of variables would mediate the relationship between child maltreatment and PTSD and that each indirect pathway would contribute uniquely to the model. A sample of adolescent females was selected to test the study aims as older children experiencing trauma are most likely to develop PTSD symptoms (Copeland et al., 2007) with females more likely to experience the different forms of child abuse (Gaudiosi,

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