



Psychological flexibility as a mediator of the association between early life trauma and psychological symptoms

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ABSTRACT

Early Life Trauma (ELT), trauma before the age of 18, often has a negative psychological impact, even into adulthood. ELT has been linked to a variety of psychopathologies in adulthood including anxiety, depression, substance abuse, and PTSD (e.g., Bremner et al., 2007). However, not all individuals who experience ELT report psychological issues. Few studies have examined factors contributing to this discrepancy. The present study examines psychological flexibility against development of depression and PTSD following ELT among a sample ($N = 240$) of undergraduates who have experienced at least one trauma. Results suggest that ELT (number of traumas and negative impact of traumas) is positively associated with depression and PTSD. Individuals with more traumas reported higher psychological flexibility; psychological flexibility was also associated with less negative impact. As expected, psychological flexibility was associated with fewer psychological symptoms (both depression and PTSD). Further, psychological flexibility partially mediated the association between negative impact of traumas and symptoms, although no mediation was supported for models including number of traumas. This suggests that psychological flexibility is a protective factor for individuals who are negatively impacted by ELT, pointing to the importance of examining impact of trauma and not just number of traumas.

1. Introduction

Early life trauma (ELT) has been identified as a public health concern because of the alarmingly high rates and long-term negative health consequences (e.g., Green et al., 2010). Green et al. reported that 53.4% of English-speaking adults in the U.S. report having experienced at least one ELT. ELT is defined as any trauma occurring prior to age 18 and includes general trauma (e.g., serious accident, death of a parent or sibling) as well as physical, sexual, or emotional abuse.

Research suggests that the impact of ELT can be far reaching and profound. ELT has been linked to a variety of psychopathologies in adulthood that includes personality disorders, anxiety, depression, substance abuse, and PTSD (e.g., Bremner, Bolus, & Mayer, 2007; Mandelli, Petrelli, & Serretti, 2015). Studies have even linked ELT with changes in brain structure and function as well as hypothalamic-pituitary-adrenal (HPA) axis (the physiological stress system) dysfunction. These changes may be at the root of increased psychopathology among those who have experienced ELT (Van der Kolk, 2003).

Interestingly, though, not all children who experience trauma demonstrate high levels of psychopathology (Schulz et al., 2014). In fact, a meta-analysis by Hiller et al. (2016) reported that between 11% and

20% of individuals who are exposed to trauma as children or adolescents experience PTSD. Research has investigated a number of protective factors such as parental/caregiver support, parental/caregiver mental health, child temperament, and child cognitive ability (for review, see Masten et al., 1999; Tiet et al., 1998) that may help to explain this discrepancy. Another factor that may play a role in the development of PTSD following ELT is experiential avoidance, a tendency to avoid private emotional events such as traumatic memories. For example, Shenk, Putnam, Rausch, Peugh, and Noll (2014) reported that experiential avoidance mediated the relationship between ELT and PTSD; those with higher levels of experiential avoidance had higher levels of PTSD following ELT. Despite the importance of these factors, another avenue for understanding why some individuals develop psychological symptoms following trauma and others do not focuses on *traits* that an individual either possesses prior to the trauma, or develops as a result of trauma, which enables her/him to experience well-being despite a traumatic experience (e.g., Bonanno et al., 2002; Nugent, Sumner, & Amstadter, 2014).

One such trait has been termed ego-resiliency (Block & Kremen, 1996), which is defined as the ability to flexibly adapt to different situational contexts. Researchers suggest that it is not developed as a

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result of trauma but instead a personal attribute that is acquired over time (Philippe, Laventure, Beaulieu-Pelletier, Lecours, & Lekes, 2011). Philippe and colleagues found ego-resiliency to be a mediator of the association between childhood trauma and psychological symptoms of anxiety, depression, and self-harm. They conclude that ego-resiliency may be protective against psychological symptoms for those who experience trauma as well as those who do not experience trauma. It can help to explain “why” individuals with trauma do not always experience high levels of distress.

Understanding the protective role of ego-resiliency can help us to better predict those who may experience psychological symptoms following trauma exposure, but since ego-resiliency is defined as a trait or “personal attribute” (Philippe et al., 2011, p. 585), it is not viewed as amendable to change. However, the related construct of psychological flexibility seems to be more adaptable to change and is an opportunity for therapeutic intervention. Psychological flexibility is defined as the ability to flexibly adapt to situations through acceptance and fully experiencing all thoughts and feelings; it also involves relying on a framework of goals and values to determine behavior choice (Hayes, Strosahl, & Wilson, 1999). For a full review of psychological flexibility, see Kashdan and Rottenberg (2010).

Psychological flexibility is at the core of Acceptance and Commitment Therapy (ACT; Hayes & Lillis, 2012). An abundance of research has pointed to the ability to improve psychological flexibility through therapy (Hayes, Pistorello, & Levin, 2012). Thus, psychological flexibility is a promising target for therapeutic intervention if it mitigates the negative psychological consequences of trauma. An empirical review by Bean, Ong, Lee, and Twohig (2017) reported that preliminary evidence suggests that ACT might be an effective therapy for individuals with a history of trauma exposure through its effect on improving psychological flexibility.

However, only a few recent studies have investigated psychological flexibility among individuals who have experienced trauma, and, per our review, none to date have studied the construct among those with ELT. Of the few articles that have been published, the findings suggest that psychological flexibility may be a promising factor to consider among traumatized individuals. For example, a study of returning Iraq war veterans reported greater relationship adjustment and less physical aggression perpetration and victimization among those who had higher levels of psychological flexibility (Reddy, Meis, Erbes, Polusny, & Compton, 2011). Another study of Iraq/Afghanistan war veterans found that psychological flexibility, in addition to greater social support and lower use of avoidant coping, was protective against PTSD and depression (Elliott et al., 2015). Further, Bordieri, Tull, McDermott, and Gratz (2014) found that among a sample of trauma-exposed individuals undergoing inpatient treatment for cannabis abuse, those with higher psychological flexibility were less likely to report PTSD symptoms. Additionally, Dutra and Sadeh (2017) found psychological flexibility to be protective against development of PTSD symptoms and externalizing behaviors among a sample of trauma-exposed veterans. Bryan, Ray-Sannerud, and Heron (2015) also found that greater psychological flexibility was protective against posttraumatic stress among Air Force personnel.

According to the research above, it is clear that, among those who have experienced trauma, psychological flexibility is protective against psychological and relational problems. As shown in Elliott et al. (2015), trauma is related to higher levels of psychological flexibility, with higher levels of psychological flexibility predicting development of psychological symptoms (i.e., a mediational model). However, as mentioned above, this has yet to be studied among individuals who have experienced ELT. Given the prevalence of ELT, it is important to identify both factors that may promote resiliency and, especially, those that may be amenable to therapeutic change. If psychological flexibility plays a protective role against psychological symptoms (i.e., depression PTSD) among those who have experienced ELT, it could provide a much-needed therapeutic target for interrupting the negative trajectory

of psychological problems experienced by children and adolescents who have been traumatized.

1.1. The present study

The present study aims to test whether psychological flexibility may help to explain, or mediate, the association between ELT and psychological symptoms (i.e., depression and PTSD). Similar to the mediational models proposed by Shenk et al. (2014) that tested experiential avoidance and Philippe et al. (2011) which tested ego-resiliency, we also propose a mediational model. Psychological processes such as psychological flexibility have shown to be mediational pathways that explain how an event (e.g., early life trauma) can result in an increased risk for psychopathology (e.g., Shenk et al., 2014). Believing that psychological flexibility is present among individuals with various amounts of trauma and who have been impacted by their trauma at various levels, we expect that psychological flexibility can play a protective role among everyone which fits with a mediational model instead of moderation. This mediational model will allow for identification of whether psychological flexibility has a specific indirect effect on psychological symptoms among those with ELT, which will inform prevention and intervention programs for those with ELT.

We test various models that include ELT, defined as the total number of traumas (Briere, Kaltman, & Green, 2008) as well as the impact of trauma on one's life emotionally, occupationally/academically, and socially. We hypothesize that ELT (both number and impact) will be positively associated with depression and PTSD symptoms. Specifically, the more traumas one has experienced and the more negative impact of the collective trauma, the more symptoms s/he will report; this hypothesis is consistent with cumulative trauma literature (e.g., Briere et al., 2008). Given prior research suggesting that more early life trauma is associated with higher levels of positive personality traits (e.g., Rademaker, Vermetten, Geuze, Mulwijk, & Kleber, 2008) and that individuals often experience positive adjustment to adversity (e.g., Bonanno & Diminich, 2013), we also hypothesized that number and impact of traumas will be associated with higher psychological flexibility. Additionally, we anticipate that psychological flexibility will be negatively associated with depression and PTSD symptoms; those with higher psychological flexibility will report lower levels of symptoms. Our main hypothesis is that psychological flexibility will mediate the association between ELT and psychological symptoms. Specifically, those with higher levels of psychological flexibility will report less depression and PTSD symptoms.

2. Method

2.1. Participants

The 251 participants were, on average, 20.51 years old ($SD = 5.02$), 73% female, and identified as 75% White, 17% Hispanic or Latino, 3% Multi-Racial, 2% Asian/Asian-American, 1% Native American, and 1% Native Hawaiian; one person identified as African American and another did not list their race/ethnicity. Participants completed a self-report survey online through the University Psychology Department and received either research credit or extra credit for a psychology course. This research was approved by the University Institutional Review Board, and all participants provided an informed consent.

2.2. Measures

2.2.1. Early life trauma

The 27-item Early Trauma Inventory Self-Report-Short Form (ETISR-SF; Bremner et al., 2007) was used to assess early life trauma, trauma that occur prior to age 18. The measure has four domains: general trauma (11 items), physical (5 items), emotional (5 items), and sexual abuse (6 items). Examples of general traumas are “being exposed

to a life-threatening natural disaster,” “seeing someone murdered,” and “divorce or separation of parents.” Physical punishment items include being “slapped in the face with an open hand” and being “punched or kicked.” Emotional abuse items include being “told you were no good” and being “put down or ridiculed.” An example of a sexual abuse item is being “touched in an intimate or private part of your body in a way that surprised you or made you feel uncomfortable.” To create the construct for analyses, the total number of traumas that each participant experienced were summed (e.g., Briere et al., 2008). We also added three items from the larger version of the ETI (ETI-SR; Bremner, Vermetten, & Mazure, 2000) that assess the impact of one’s traumatic experiences on her/his emotional, work/academic, and social lives. An example item is “Do you believe these events have an emotional effect on you today?” These three items were answered on a Likert scale ranging from 1 (*extremely positive*) to 7 (*extremely negative*) and averaged to create the construct of trauma impact, a separate construct from total number of traumas. Bremner et al. (2007) report high internal consistency (0.70 for general trauma, 0.75 for physical abuse, 0.86 for emotional abuse, and 0.87 for sexual abuse). The current study found internal consistencies of 0.66 for general trauma, 0.76 for physical abuse, 0.85 for emotional abuse, and 0.81 for sexual abuse. Bremner et al. (2000) do not report a reliability coefficient for the 3-item impact scale, but the internal consistency for the present study was 0.83.

2.2.2. Psychological flexibility

The Psychological Flexibility Questionnaire (PFQ; Ben-Itzhak, Bluvstein, & Maor, 2014) was used to measure psychological flexibility. Participants responded to the 20 items of the PFQ using a Likert scale ranging from 1 (*not at all*) to 6 (*very much*). An example item is: “In situations of changeable reality I am able to initiate the required changes.” Ben-Itzhak et al. (2014) report an internal consistency value of 0.92. The internal consistency of the PFQ in the present study was 0.84.

2.2.3. Depression

The 20-item General Depression subscale of the Inventory of Depression and Anxiety Symptoms—Second Version (IDAS-II; Watson et al., 2012) was used to measure depression symptoms. Participants respond to items using a Likert scale ranging from 1 (*not at all*) to 5 (*extremely*). An example item from the General Depression subscale is “I had little interest in my usual hobbies and activities.” Watson, O’Hara, and Simms (2007) reported an internal consistency value of 0.89, and internal consistency in the present study was 0.92.

2.2.4. Posttraumatic Stress Disorder (PTSD)

The PTSD Checklist for the DSM-5 (PCL-5; Weathers et al., 2013) was used to assess PTSD symptoms. The PCL-5 is a 20-item self-report measure in which participants respond to each item using a Likert scale ranging from 0 (*not at all*) to 4 (*extremely*), reflecting upon how much they were bothered by each symptom *in the last month*. The PCL-5 has 4 subscales that represent the clusters of symptoms for PTSD in the DSM-5; these subscales are Avoidance, Intrusion, Negative Alterations in Mood and Cognition, and Alterations in Arousal and Reactivity. Scores from all subscales were summed to create a total PCL-5 score to be used in analyses. Bovin et al. (2016) reported an internal consistency value of 0.96. The present study found an internal consistency value of 0.94.

2.3. Analytic procedure

The main analyses are focused on examining psychological flexibility as a mediator of the association between ELT (both number and impact) and psychological symptoms (i.e., depression and PTSD). We ran 4 separate mediational models (Fig. 1): A) total traumas predicting depression, B) total traumas predicting PTSD symptoms, C) trauma impact predicting depression, and D) trauma impact predicting PTSD symptoms. Psychological flexibility was tested as a mediator of all 4

models. We used SPSS PROCESS macro with 10,000 bootstrap samples for coefficient and indirect estimation to run all four mediation analyses. For a significant mediation model, three main regression analyses must produce significant results: a) predictor and mediator, b) mediator and outcome, and c) predictor and outcome. We then tested for a complete mediation, which is when the association between predictor and outcome (path c) becomes nonsignificant when controlling for psychological flexibility, the mediator. Alternatively, we tested for partial mediation in which the association is lessened but does not necessarily become nonsignificant. Path *c'* (Fig. 1) represents the unstandardized beta coefficient for the association between predictor and outcome when controlling for psychological flexibility.

3. Results

3.1. Preliminary results

Of the 251 participants, 240 (96%) reported at least one trauma. Only those 240 were included in all future analyses. Descriptive statistics and correlations for all variables among those with at least one trauma are reported in Table 1. Of the 240 reporting at least one trauma, 220 (92%) reported at least one general trauma, 150 (63%) reported at least one instance of physical abuse, 152 (63%) reported emotional abuse, and 76 (32%) reported sexual abuse. Participants reported, on average, that they had experienced 3.09 ($SD = 2.11$) out of the 11 general traumas criteria, 1.55 ($SD = 1.57$) out of the 5 physical abuse criteria, 1.83 ($SD = 1.84$) out of the 5 emotional abuse criteria, and 0.79 ($SD = 1.43$) out of the 5 sexual events criteria. They also reported an average of 7.26 total traumas prior to age 18. The Total Trauma, Depression, and PTSD variables were significantly skewed. Mediation models were analyzed with square root variables, which corrected for skew, and overall results were the same; to aid in interpretation, we used non-square root variables for all analyses.

3.2. Mediational analyses

Results from mediational analyses are reported in Fig. 1. Testing path a for each model, Total Trauma and Trauma Impact were both significant predictors of Psychological Flexibility, $b = 0.43$, $t(219) = 2.60$, $p < .01$ (Model A), $b = 0.44$, $t(218) = 2.67$, $p < .01$ (Model B), $b = -1.88$, $t(164) = -1.88$, $p < .05$ (Model C), and $b = -1.81$, $t(163) = -2.08$, $p < .05$ (Model D). Psychological Flexibility was a significant predictor of both Depression (Model A: $b = -0.32$, $t(218) = -4.16$, $p < .001$; Model C: $b = -0.23$, $t(163) = -2.45$, $p < .05$) and PTSD (Model B: $b = -0.34$, $t(217) = -4.22$, $p < .001$; Model D: $b = -0.18$, $t(162) = -1.80$, $p < .05$), so path b was significant for all four models. Total Trauma as well as Trauma Impact were significant predictors of both Depression and PTSD which means that path c was also significant for all four models (Model A: $b = 0.99$, $t(219) = 5.03$, $p < .001$; Model B: $b = 1.22$, $t(219) = 5.92$, $p < .001$; Model C: $b = 3.53$, $t(164) = 3.39$, $p < .001$; Model D: $b = 4.06$, $t(163) = 3.65$, $p < .001$).

We then tested for complete versus partial mediation for all four models. Including Psychological Flexibility in Models A and B (those with Total Trauma as predictor) did not reduce the effect of predictor on outcome suggesting that no mediation was present (see path *c'*). However, when including Psychological Flexibility in Models C and D (those with Trauma Impact as predictor), there was a reduction in the effect of predictor on outcome, although path *c'* was still significant for both models; this suggests that partial mediation is supported for both models.

4. Discussion

The aim of the present study was to assess whether psychological flexibility may mediate the association between early life trauma (ELT)

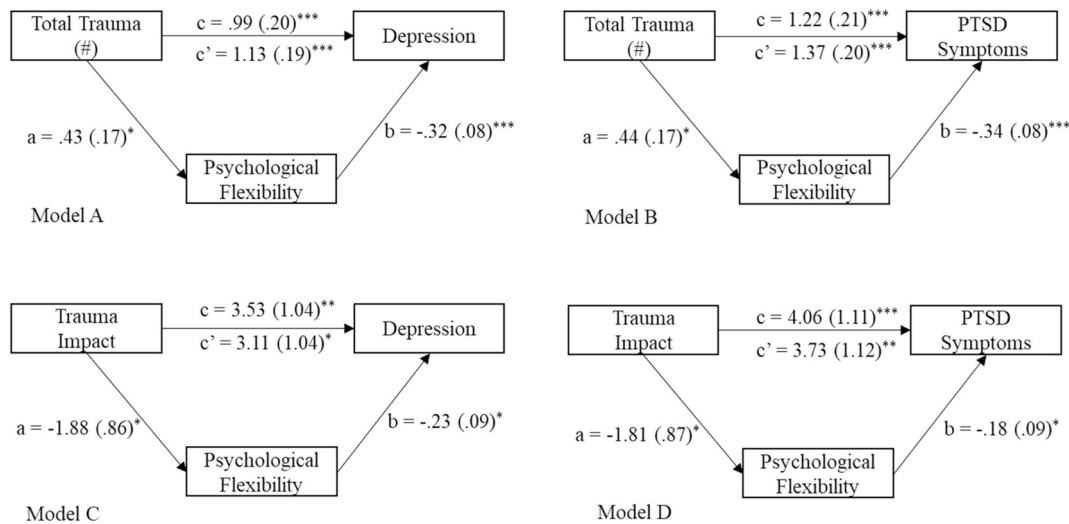


Fig. 1. Mediation results. Partial mediation was supported for Models C and D. $^{***}p < .001$; $^{**}p < .01$; $^*p < .05$.

Table 1

Descriptive statistics and correlations for all variables among those with at least one trauma.

Variable	M (SD)	Range	Skewness (SE)	Kurtosis (SE)	1	2	3	4	5
1. Total trauma (#)	7.26 (4.91)	1.00–24.00	1.01 (0.16)	0.80 (0.31)	–	–	–	–	–
2. Trauma impact	4.51 (1.07)	1.67–6.67	–0.28 (0.18)	–0.21 (0.37)	0.25 **	–	–	–	–
3. Psychological flexibility	87.43 (11.96)	52.84–117.00	0.05 (0.16)	–0.04 (0.31)	0.18 *	–0.17 *	–	–	–
4. Depression	47.07 (14.99)	20.00–89.00	0.50 (0.16)	–0.48 (0.31)	0.32 **	0.26 **	–0.20 **	–	–
5. PTSD	39.72 (15.88)	20.00–82.00	0.67 (0.16)	–0.57 (0.31)	0.37 **	0.28 **	–0.19 **	0.71 **	–

Two-tailed tests.

$^{**} p < .01$.

$^* p < .05$.

and psychological symptoms (depression and PTSD). A few studies to date (e.g., Bordieri et al., 2014; Bryan et al., 2015; Dutra & Sadeh, 2017; Elliott et al., 2015; Reddy et al., 2011) have examined psychological flexibility as a promising protective factor among traumatized individuals, but, to our knowledge, no studies to date have focused on ELT. Many studies highlight risk factors associated with ELT, but it is also important to focus on positive strengths of individuals who have experienced ELT. Given the prevalence of ELT, there is a need to better understand resilience factors as well as factors that may be targets for therapeutic change that may help to lessen the psychological consequences of ELT. The current study operationalized ELT as the number of total traumas (i.e., general, physical, emotional, and sexual) one experienced prior to age 18 as well as the impact of those traumas on individuals emotionally, occupationally/academically, and socially.

Our results suggested that ELT (both number of traumas and impact of trauma) were positively and significantly associated with depression and PTSD symptoms. In other words, the more traumas and more negative impact of the trauma that one reported, the more symptoms they endorsed. This is consistent with an abundance of prior research that has linked ELT to a variety of psychopathologies in adulthood (e.g., Bremner et al., 2007; Mandelli et al., 2015). Bremner et al. (2000) also reported that individuals reporting a more negative impact of trauma endorsed more PTSD symptoms.

In addition to testing the effect of ELT on symptomatology, we tested the association between ELT and psychological flexibility. We hypothesized that higher number of traumas and higher trauma impact would both be associated with higher psychological flexibility. Results indicated that individuals who had experienced more traumas reported higher levels of psychological flexibility. This is consistent with literature on psychological resiliency (e.g., Edwards, Probst, Rodenhizer-Stämpfli, Gidycz, & Tansill, 2014; Wingo et al., 2010) and

posttraumatic growth (e.g., Schubert, Schmidt, & Rosner, 2016). Perhaps the experience of trauma contributed to the development of psychological flexibility, although this would need to be assessed in a future study with a longitudinal design. However, those who reported being more negatively impacted by their trauma(s) reported lower levels of psychological flexibility. This may be because individuals who are still feeling the negative impact of their trauma did not develop psychological flexibility to reduce the impact of the trauma. We also found that psychological flexibility was associated with lower levels of depression and PTSD symptoms which has been supported in prior literature (e.g., Bordieri et al., 2014; Dutra & Sadeh, 2017; Elliott et al., 2015).

Further, we assessed the mediational role of psychological flexibility on the associations between ELT (both number and impact) and psychological symptoms (i.e., depression and PTSD). As anticipated, we found a significant mediational model (partial) for the models including Trauma Impact as a predictor of both Depression (Model C) and PTSD symptoms (Model D) although the mediational models with Total Trauma as a predictor (Models A and B) were not supported. These results suggest that psychological flexibility plays a protective role against depression and PTSD among individuals who have been negatively impacted by their ELT(s). In other words, individuals who are better able to flexibly adapt to situations, accept their full experience (e.g., thoughts and feelings), and rely on a values framework for making decisions in their lives are less likely to experience psychological consequences following ELT. Other studies have reported a significant mediation of psychological flexibility of psychological outcomes among trauma-exposed individuals (e.g., Dutra & Sadeh, 2017; Elliott et al., 2015; Reddy et al., 2011), but this is the first study to date, to our knowledge, to show that it is also protective among those who have experienced a negative impact from ELT. This study on ELT is important

because one cannot assume that results from previous studies of trauma exposure (e.g., military trauma) would generalize to those with ELT. ELT often has lifelong impacts on psychological well-being (e.g., Mandelli et al., 2015) given that the trauma happens during early developmental stages, and, if individuals with ELT do seek treatment, it often does not occur until many years after the trauma. This may pose an additional challenge for treatment given that early trauma impacts maturation of brain structures, physiological responses, and one's ability to regulate emotions and behavior (Van der Kolk, 2003).

5. Limitations and future directions

Despite the importance of the findings, there are a number of limitations that deserve to be mentioned. The study population was predominately female, White, and from a non-clinical population which limits the generalizability of the results. Also, all participants are currently enrolled in an undergraduate university suggesting that they have maintained at least an adequate level of functioning to matriculate at university. Even though there are college students whose academic engagement and performance are negatively impacted by their ELT, it would be beneficial to conduct this study using a community sample that includes individuals whose ELT may have interfered with their academics, making it difficult to obtain a college education.

This study is also limited by its cross-sectional design which did not allow us to test causality or longitudinal impacts of one's trauma. A longitudinal study would allow us to better assess whether psychological flexibility existed prior to the trauma or whether it develops because of the trauma. Although the typical-aged college student (age 18–22) is closer in age to their ELT than older adults, it might still be beneficial to study children or teenagers who have more recently, or are currently, experiencing trauma to reduce retrospection. Future studies may improve upon the current design by also measuring and controlling for the time length since the trauma, any traumas that may have occurred since the age of 18, and duration of the trauma. It might also be helpful to better understand how different types of traumas (i.e., general, physical, emotional, and sexual) differentially impact an individual. Additionally, since the present study measured PTSD and psychological symptoms generally, it could be interesting to measure them in relation to a specific traumatic event, possibly the most traumatic event in one's life. Although participants were encouraged to consider “the most stressful event” while completing the PCL-5, scores may be inflated due to priming them to think about all of their ELTs prior to completing the PCL-5.

Additionally, it would be advantageous to focus research on evaluating treatment for individuals who have experienced ELT. The results of this study suggest that psychological flexibility may be a target for therapeutic intervention, but future study is needed. ACT has shown to be an efficacious treatment for individuals with a trauma history although it has not yet been investigated in a sample of individuals with ELT.

It is interesting to note that psychological flexibility plays a protective role among those who have experienced more negative impact from trauma, and mediational analyses with number of traumas as predictor were not supported. Perhaps it is best to conceptualize ELT by its impact rather than simply by the number of traumas that one experienced because this may play a larger role in whether therapy aimed at improving psychological flexibility is effective in reducing psychological and PTSD symptoms.

Further, targeting psychological flexibility in therapy may help to build psychological resiliency, psychological attributes that protect against negative consequences of abuse. Research has found that individuals with higher psychological resiliency are less likely to report PTSD symptoms following ELT (e.g., Edwards et al., 2014; Wingo et al., 2010). Future research may assess associations between psychological flexibility and psychological resiliency, particularly in regard to how ACT aimed at improving psychological flexibility may indirectly affect psychological resiliency.

6. Conclusions

The results of this study suggest that ELT is, indeed, associated with higher levels of psychological symptoms such as depression and PTSD, but that psychological flexibility is also associated with lower levels of symptoms. A partial mediation model was supported for psychological flexibility as a mediator to the association between the negative impact of ELT and depression and PTSD symptoms. This suggests that psychological flexibility may facilitate coping with the negative impact of ELT and influence an individual's ability to overcome negative psychological consequences. It also points to the importance of considering how negatively impacted an individual was by their ELT rather than merely the overall number of traumas that one experienced.

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