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5-16-2018

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Influence of Multiple Traumatic Event Types on Mental Health Outcomes: Does Count Matter?

Monica M. Gerber[1] · Sheila B. Frankfurt[2,3] · Ateka A. Contractor[1] · Kelsey Oudshoorn[1] ·
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Abstract

The experience of potentially traumatizing events (PTEs) may be associated with conflicting outcomes: individuals may experience greater psychological distress (dose-response theory), or individuals may become more resilient against repeated PTEs (stress-inoculation theory). With limited empirical data comparing these theories, we examined the relationships between the count of lifetime PTE types and psychological outcomes [posttraumatic stress disorder (PTSD), depression, impaired distress tolerance] using linear and quadratic regressions. A linear relationship would support the dose-response theory, and a quadratic relationship would support the stress-inoculation theory. We also explored whether there was a threshold number of PTE types fostering resiliency before an increase of distressing outcomes. The sample included 123 (68.30% female) treatment-seeking patients at a community mental health center participating in a larger study (Contractor et al. in *Psychiatry Research, 252*, 252215–252222, 2017). Linear regression results indicated number of PTE types significantly predicted increasing PTSD and depression severity and distress tolerance difficulties. Quadratic regression model results were not significant. ROC analyses indicated exposure to at least 3.5 PTE types predicted PTSD with moderate accuracy. In conclusion, the dose-response theory was supported, with results indicating there may be a threshold count of lifetime PTE types (> 3) influencing traumatic stress outcomes.

Keywords Lifetime traumatic experiences · PTSD · Depression · Distress tolerance · Dose-response theory · Stress-inoculation theory

Most people experience at least one potentially traumatic event (PTE) in their lifetime and experiencing one PTE confers a risk for experiencing additional lifetime PTEs (Banyard et al. 2001; Kilpatrick et al. 2013). Among the trauma theories outlining the relation between multiple PTEs and mental health outcomes, the dose-response theory (Turner and Lloyd 1995) posits that experiencing multiple PTEs increases psychopathology, and the stress-inoculation theory (Seery 2011) posits that experiencing multiple PTEs may build resilience and paradoxically decrease psychopathology. Rarely have investigators empirically compared these theories. Consideration of the *count* of PTE types could explain the contradictory nature of these theories. A certain count of PTE types could promote resilience; additional PTE experiences beyond this optimal count could have a detrimental effect. Thus, we examined the nature of the relation between count of PTE types and psychopathology constructs (i.e., PTSD, depression, distress tolerance), and examined a threshold count of PTEs, which we defined as the level at which any additional PTEs could increase psychopathology severity rather than boost resilience.

Dose-Response Theory

The dose-response theory models a positive association between lifetime PTEs and negative mental health outcomes

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(Turner and Lloyd 1995). Evidence indicates that experiencing multiple PTE types leads to a more severe and/or broader pattern of psychopathology compared to the experience of a single PTE type (Briere et al. 2016; Contractor et al. 2018; Diamond et al. 2010; Herman 2012; Mollica et al. 1998; Stein et al. 2016; Turner and Lloyd 1995); this is called a "building block" cumulative effect (Schauer et al. 2003; Kolassa et al. 2010). In fact, psychological mechanisms linking the experience of one PTE to subsequent PTEs may worsen their cumulative impact. Experiencing a PTE may lead to perceived changes in the self, maladaptive coping strategies (Fetzner et al. 2014; Lezak et al. 2012; DePrince et al. 2011), negative cognitive appraisals (Whiting and Bryant 2007), and physiological changes (Campbell et al. 2007; Cicerone and Fraser 1999) including interruptions in neurological development (Heim et al. 2008). Such vulnerabilities may contribute to a risk for experiencing later PTEs (Finkelhor et al. 2009), and subsequently greater psychopathology (e.g., Heim et al. 2008; Whiting and Bryant 2007). Further, PTEs occurring in one context (e.g., at home) may increase the likelihood of PTEs in different contexts (e.g., in school) which again can contribute to a detrimental cumulative impact when PTEs are experienced at a young age (e.g., Ehrensaft et al. 2003).

In the current study, we focus on three widely researched psychological outcomes of PTEs: posttraumatic stress disorder (PTSD), depression, and impaired distress tolerance. Research indicates that experiencing multiple PTEs contributes to increased risk of a PTSD diagnosis and greater PTSD severity (Briere et al. 2016; Jakob et al. 2017; Sullivan et al. 2017). For example, Karam et al. (2014) found that 19.80% of participants in a multi-national sample experiencing PTSD symptoms for at least 12 months reported multiple PTEs. Further, evidence indicates that spontaneous remission of PTSD symptoms also decreases with increased count of PTEs and increased severity of PTE types, which is demonstrated by the "building block" cumulative effect (Kolassa et al. 2010).

Experiencing multiple lifetime PTEs also heightens risk for increased depression severity (Agorastos et al. 2014; Mollica et al. 1998; Stein et al. 2016). A study of South African 14–18-year-olds found that depression severity increased with greater number of PTEs (Suliman et al. 2009). Similarly, sexual minority youth experiencing multiple PTEs reported higher levels of depression symptomatology (Mustanski et al. 2016). Such results may partly reflect PTSD's significant comorbidity with depression (Rytwinski et al. 2013). It is, therefore, important to consider changes in the prevalence and severity of depression in individuals with a history of multiple PTEs.

Lastly, distress tolerance difficulties are another prevalent psychological outcome of experiencing PTEs (Kraemer et al. 2013; Marshall-Berenz et al. 2010; Vujanovic et al. 2013). Distress tolerance is one's perceived ability to handle physical and emotional distress (Simons and Gaher 2005; Leyro et al. 2010). With the experience of a PTE, an individual may find it difficult to cope emotionally, develop maladaptive coping skills, and thus experience distress tolerance difficulties (Vujanovic et al. 2011a). With each additional PTE, distress tolerance may be lowered which further decreases an individual's capacity to cope effectively (Fetzner et al. 2014), and in turn may increase the risk of experiencing additional PTEs (Finkelhor et al. 2009). Research has found that distress tolerance difficulties mediate the relation between PTEs and PTSD severity and other co-occurring conditions such as alcohol use (Holliday et al. 2016; Vujanovic et al. 2011b) and suicidal attempts (Anestis et al. 2012); these in turn may be a risk factor for additional PTEs (Ehrensaft et al. 2003; Finkelhor et al. 2009).

Stress-Inoculation Theory

The *stress-inoculation* (Meichenbaum 2007), *resilience* (Bonanno 2004), or *steeling* (Rutter 2012) effect states that experiencing multiple PTEs may enable people to become better equipped to face future adversities, and hence may negatively relate to psychopathology (Seery 2011). Prior research indicates inoculation is impacted by several factors including timing and severity of initial PTEs and individual differences in coping (Agaibi and Wilson 2005; Ashokan et al. 2016; Fossion et al. 2014; Seery 2011). Though most research on stress-inoculation focuses on adverse childhood events, exposure to moderately severe PTEs in adulthood may also foster subsequent psychological "toughness" (Seery 2011). For example, Schnurr et al. (1993) found that Vietnam War Veterans experiencing "peripheral/indirect" versus "direct" or no combat exposure exhibited improvements in psychological functioning. Stress-inoculation is used in PTSD interventions to foster recovery following PTEs and build resilience to future stressors by providing controlled exposure to distressing content in a therapeutic context (Hains 1992; van Minnen et al. 2010; Wiederhold and Wiederhold 2008).

Dose-Response Theory Vs. Stress-Inoculation Theory

Thus, the stress-inoculation theory offers a counterview to the dose-response theory indicating there may be a quadratic or "U-shaped" relationship between count of PTE types and psychological well-being. In this context, a quadratic relationship means initially a certain amount of distress may foster strength and improved mental health until a threshold is reached, at which point the amount of distress becomes overwhelming and may lead to a decline in mental health. Seery et al. (2010) used quadratic modelling in a longitudinal study to examine functional impacts of PTE exposure in

varying "doses." They found individuals in a national sample who had experienced prior adversities were more likely to demonstrate resilience following a recent PTE than individuals with no prior, or extensive PTE experience. This finding demonstrates the quadratic "U-shaped," rather than a positive linear, relationship between PTEs and negative mental health outcomes. Additionally, Seery et al. (2013) found that individuals with a history of "some adversity" exhibited better coping in a laboratory-based pain exposure experiment, than did participants with histories of no or high lifetime adversity.

One potential explanation for why some individuals experience a dose-response effect and others experience a stress-inoculation effect following PTEs could relate to the count of PTE types. In other words, there may be a "tipping point" or threshold count of PTE types (e.g. Jakob et al. 2017; Suliman et al. 2009; Karam et al. 2014) influencing the association between PTEs and psychological outcomes. Studies that examined this threshold number of PTEs found that experiencing four PTEs increased the risk of psychopathology (Miranda et al. 1997; Karam et al. 2014). To elaborate, Miranda et al. (1997) noted increased severity in psychological outcomes when participants reported a count of four versus three PTEs. Further, using receiver operating characteristic curve analysis (ROC), Karam et al. (2014) evidenced a potential "risk threshold" for severe psychopathology and functional impairment after four PTEs in an international sample. The study took into account age of first PTE, number of times different PTE categories had been experienced (e.g., physical assault, unwanted sexual contact, etc.), and PTSD severity. Thus, experiencing at least four PTEs seem to be detrimental to an individual's functioning, based on prior studies.

Current Study

To date, there is limited research investigating nuanced effects of multiple PTEs in adult populations. The empirical question of whether an individual experiences resilience or distress following PTEs may influence provision of care for survivors of multiple PTEs, as outcomes seem more nuanced and contextually based than perhaps initially thought. Thus, in the present study, we assessed the (1) nature of the relationship between the count of lifetime PTE types and psychological outcomes (PTSD, depression, distress tolerance difficulties), and (2) the minimum threshold count of lifetime PTE types that was predictive of detrimental psychological outcomes. Given the literature reviewed above, we predicted that count of lifetime PTE types would linearly predict greater PTSD severity, depression severity, and distress tolerance difficulties. In an exploratory manner, we additionally examined the threshold count of PTE types with a detrimental impact on psychological outcomes (PTSD diagnosis, depression).

Method

Procedure and Participants

Participants ($n = 308$) seeking mental health services were recruited from waiting rooms at a Midwest community mental health center. Inclusion criteria included age 18 years and older and a working knowledge of the English language. After providing informed consent, participants were presented a web-survey of questionnaires at their first or second therapy appointment that were completed in approximately 30 min. There was no compensation for participation. This study was approved by a Midwestern university's Institutional Review Board. The present study is a secondary analysis of this larger dataset (see Contractor et al. 2017 for full study details).

For the current study, only those participants who completed at least 70% of study measures and reported at least one PTE (either endorsed one PTE on the first 13 items of the Stressful Life Events Screening Questionnaire [SLESQ], or endorsed their most distressing PTE on item 14 of the SLESQ) were included ($n = 123$). Subsequent missing data was minimal. The sample of 123 participants averaged 35.72 years in age ($SD = 12.07$), and were mostly female ($n = 84$; 68.30%). On average, participants had 3.58 ($SD = 4.92$) visits to a health care professional to seek mental health treatment over the past 12 months. Table 1 indicates detailed information on demographics and psychopathology constructs.

Measures

Demographic Information including age, gender, ethnicity, race, employment status, income, relationship status, and years of schooling was obtained.

Stressful Life Events Screening Questionnaire (SLESQ) The SLESQ (Goodman et al. 1998) is a 14-item self-report measure assessing 13 types of lifetime PTEs using dichotomous response options (yes or no). The last item (item 14) asks participants to indicate the most distressing PTE. The SLESQ has good test-retest reliability (averaging .73 for the 11 *Diagnostic and Statistical Manual, 4th Edition*-based traumatic events), and good concurrent and convergent validity (Goodman et al. 1998). To be consistent with the *DSM-5* criteria, individuals who reported PTE exposure only via media were excluded from the final sample. Additionally, a question referencing repeated exposure to details of a traumatic event, with additional probes of exposure through media or one's occupation was added (Elhai et al. 2011).

PTSD Checklist for *DSM-5* (PCL-5) The PCL-5 (Weathers et al. 1993) is a 20-item self-report measure assessing past month

Table 1 Descriptive information on demographics and psychopathology constructs

	Mean (SD)	n (%)
Age (n = 123)	35.72 (12.07)	
Years of schooling (n = 122)	12.98 (2.73)	
Gender (n = 123)	Male	39 (31.70%)
	Female	84 (68.30%)
Employment Status (n = 123)	Part time	20 (16.30%)
	Full time	59 (48.00%)
	Retired	5 (4.10%)
	Unemployed	33 (26.80%)
	Unemployed Student	6 (4.90%)
Current annual household income (n = 123)	Less than $24,999	74 (60.20%)
	$25,000 or higher	49 (39.80%)
Current Relationship Status (n = 123)	Single	49 (39.80%)
	Living with significant other	12 (9.80%)
	Married	38 (30.90%)
	Divorced, separated, or widowed	24 (19.50%)
Ethnicity (n = 121)	Hispanic or Latino	14 (11.60%)
	Not Hispanic or Latino	99 (81.80%)
Race (could endorse multiple choices; n = 123)	Caucasian	114 (92.70%)
	African American	7 (5.70%)
	Asian	0 (0.00%)
	American Indian/Alaskan Native	1 (0.80%)
	Native Hawaiian/Other Pacific Islander	1 (0.80%)
	Unknown	2 (1.60%)

N's = 121–123 due to missing data on ethnicity variable. All reported percentages are *valid percentages* to account for missing data

PTSD symptoms stemming from the event identified as most distressing on the SLESQ with a five-point Likert-type response scale ranging from 0 (not at all) to 4 (extremely). In the current study, internal consistency was excellent, with $\alpha = .98$. The PCL-5 has demonstrated adequate internal consistency, convergent and discriminant validity (Bovin et al. 2016).

Patient Health Questionnaire-9 (PHQ-9) The PHQ-9 (Kroenke et al. 2001) is a 9-item self-report measure assessing *DSM-IV/5* depression symptoms over the past two weeks with four response options ranging from 0 (not at all) to 3 (nearly every day). Cut-off scores of 5, 10, 15 and 20 represent mild, moderate, moderately severe, and severe depression, respectively. PHQ-9 scores ≥10 had a sensitivity of 88% and specificity of 88% for major depression; thus PHQ-9 > = 10 was the diagnostic cut-off in the ROC analyses. The PHQ-9 has acceptable internal consistency ($\alpha = .92$ in the current study), good test-retest reliability ($r = .84$), good construct validity, and good diagnostic validity (Kroenke et al. 2001).

Distress Tolerance Scale (DTS) The DTS (Simons and Gaher 2005) is a 15-item measure assessing one's perceived ability to tolerate emotional distress. It has a response scale ranging

from 5 (strongly disagree) to 1 (strongly agree), where higher scores indicate higher distress tolerance ability (Simons and Gaher 2005). The four components of the DTS include: (1) ability to tolerate emotions (tolerance; $\alpha = .86$ in the current study); (2) assessment of the emotional situation as acceptable (appraisal; $\alpha = .81$ in the current study); (3) level of attention to the negative emotion and subsequent functional interference (absorption; $\alpha = .90$ in the current study); and (4) ability to regulate emotion (regulation; $\alpha = .89$ in the current study). The DTS has adequate to good internal consistency ($\alpha = .89$ for the entire scale in the current study), good test-retest reliability, and good to excellent validity (Simons and Gaher 2005; Leyro et al. 2010).

Data Analyses

We used SPSS version 23 (IBM, 2015) for our analyses. Based on benchmarks of skewness >2 and kurtosis >7 (Curran et al. 1996), all variables were normally distributed. Missing data were handled using pairwise deletion.

First, we ran correlations between study variables. Second, we ran linear and quadratic regressions using count of lifetime PTE types predicting *DSM-5* PTSD severity, depression severity, and distress tolerance total and subscale scores

(tolerance, absorption, appraisals, regulation). If the dose-response model was supported, we expected that PTSD and depression severity would linearly increase, and distress tolerance would linearly decrease with increasing count of lifetime PTE types. If the stress-inoculation model was supported, we expected to find a quadratic U-shaped relationship between count of lifetime PTE types and psychopathology indicators; little exposure to lifetime PTE types would be associated with higher psychopathology, moderate exposure to lifetime PTE types would be associated with lower psychopathology, and hig exposure to lifetime PTE types would again be associated with higher psychopathology.

Lastly, we ran ROC analyses to identify a threshold count of lifetime PTE types that predicted a PTSD diagnosis (PTSD diagnostic status was defined as a score of 2 or greater on at least 1 Criterion B, 1 Criterion C, 2 Criterion D, and 2 Criterion E symptoms (APA, 2013) or meeting clinical cut-off for clinical depression (PHQ-9 > = 10). Accuracy of ROC is measured by the area under the curve (AUC); .90–.1 is considered excellent, .80–.90 is considered good, .70–.80 is considered fair, .60–.70 is considered poor, and .50–.60 is considered unacceptable (Fischer et al. 2003). ROC analyses index the sensitivity and specificity of point estimates of count of lifetime PTE types in predicting clinical PTSD and depression. Sensitivity is the true positive rate, i.e., the proportion of cases that are correctly identified as meeting diagnostic criteria. Specificity is the true negative rate, i.e., the proportion of cases that are correctly identified as not meeting diagnostic criteria.

Results

Participants reported experiencing on average 3.96 types of PTEs ($SD = 2.68$; range = 0–12 on the first 13 items of the SLESQ). The most frequently reported PTE types were sudden and unexpected death of a close loved one because of accident, homicide, or suicide ($n = 66$; 54%), adult physical assault ($n = 66$; 54%), and being threatened by a weapon ($n = 48$; 39%). Additionally, 35% of the sample ($n = 43$) reported unwanted sexual touching as a child or adult. The unexpected death of a loved one because of violence was most frequently nominated as the most distressing event ($n = 36$; 29%).

Basic descriptive statistics and correlations are in Tables 1 and 2. Results indicated a significant positive linear relationship between count of lifetime PTE types and total PTSD severity, and between count of lifetime PTE types and depression severity. Further, results indicated a significant negative linear relationship between count of lifetime PTE types and distress tolerance scores (total and subscale-level). Linear models explained approximately 3%–23% of the variance in the total PTSD scores, total depression scores, and the total and subscale distress tolerance scores, which corresponds to a small effect (Cohen 1992). Follow-up analyses on distress

tolerance subscales identified a significant linear association between count of lifetime PTE types and the appraisal, absorption, and regulation distress tolerance subscale scores (not the tolerance subscale score). The quadratic model results were not significant. See Table 3 for results of linear and quadratic regression models.

In the current sample, 34.9% of the sample ($n = 43$) met PTSD diagnostic criteria and 46.3% of the sample ($n = 57$) met clinical cutoff for depression. ROC analyses indicated that count of lifetime PTE types had fair accuracy in detecting people who met PTSD diagnostic criteria ($AUC = .73$, $SE = .05$, $p < .001$); exposure to at least 3.5 PTEs types predicted meeting PTSD diagnostic criteria with sensitivity = .74 and specificity = .58 (see Fig. 1). Count of lifetime PTE types had poor accuracy in detecting people who met clinical cut-off for depression ($AUC = .62$, $SE = .05$, $p < .05$); exposure to at least 4.5 PTEs predicted depression with sensitivity = .46 and specificity = .70 (see Fig. 2). See Table 4 for ROC results.

Discussion

The present study examined the relationship between count of lifetime PTE types and psychological outcomes of depression, PTSD, and impaired distress tolerance. We hypothesized that a greater count of PTE types would significantly predict greater PTSD severity, depression severity, and distress tolerance difficulties. We also explored whether there was a threshold in count of lifetime PTE types that predicted clinically significant PTSD and depression.

Consistent with our hypothesis, results indicated that the count of lifetime PTE types significantly and linearly predicted increased psychological outcome severity. Consistent with prior research, participants in the current study reported increased PTSD severity (Briere et al. 2016; Jakob et al. 2017; Sullivan et al. 2017; Karam et al. 2014), depression severity (Agorastos et al. 2014; Mollica et al. 1998; Stein et al. 2016; Suliman et al. 2009), and distress tolerance difficulties (excluding emotional tolerance) (Simons and Gaher 2005; Leyro et al. 2010; Fetzner et al. 2014) with increasing count of lifetime PTE types. A non-significant relationship between greater PTEs and emotional tolerance abilities may have been impacted by participants' current support in tolerating emotional experiences via mental health care services. For the construct of distress tolerance, individuals reporting more PTE types experienced more difficulties in accepting the situation, adaptively regulating attention to negative emotions, and regulating negative emotions in an adaptive manner.

Our findings are consistent with previous research aligning with the dose-response effect of experiencing multiple PTEs (Contractor et al. 2018; Sullivan et al. 2017; Turner and Lloyd 1995). Quadratic regressions testing the stress-inoculation models were non-significant. Previous literature on both

Table 2 Study variable descriptives and intercorrelations

	Mean (SD)	1	2	3	4	5	6	7	8
1. Lifetime # PTEs	3.98 (2.66)	–	.48**	.30**	−.20*	−.01	−.18*	−.23*	−.18*
2. Total PTSD severity	25.79 (23.56)	–	–	.63**	−.40**	−.31**	−.42**	−.35**	−.37**
3. Depression	9.92 (6.98)	–	–	–	−.50**	−.42**	−.45**	−.47**	−.41**
4. DTS total score	48.78 (15.26	–	–	–	–	.90**	.93**	.94**	.87**
5. DTS tolerance subscale	9.48 (3.54)	–	–	–	–	–	.85**	.77**	.73**
6. DTS absorption subscale	9.75 (3.70)	–	–	–	–	–	–	.83**	.73**
7. DTS appraisal subscale	19.38 (5.77)	–	–	–	–	–	–	–	.74**
8. DTS regulation subscale	9.82 (3.54)	–	–	–	–	–	–	–	–

N = 112–123 due to missing data on some variables, *p < .05. **p < .01

PTE Potentially Traumatic Events; *DTS* Distress Tolerance Scale

models indicate both outcome pathways are complex and influenced by multiple variables, including event type, severity, and timing (Briere et al. 2016; Bonanno 2004; deRoon-Cassini et al. 2010; Diamond et al. 2010; Seery 2011). While our present results are consistent with existing trauma literature, it is remains important to attain a richly detailed trauma history to best understand an individual's pathways and outcomes.

Lastly, ROC analyses indicated the count of lifetime PTE types as measured by the SLESQ may be able to predict PTSD severity with fairly stong accuracy, and clinically moderate depression with poor accuracy. PTSD is a primary psychological outcome with hypothesized links to the experience of PTEs (Briere and Scott 2006; Briere et al. 2016; Jakob et al. 2017), and is highly comorbid with depression following a PTE (LeBouthillier et al. 2015; McQuaid et al. 2001; Rytwinski et al. 2013). Our findings suggest that assessing the count of lifetime PTE types is more critical in evaluating a PTSD diagnosis compared to depression severity, which is consistent with indications from previous research (LeBouthillier et al. 2015; Pietrzak et al. 2011; Thibodeau et al. 2013).

Further, the threshold count of lifetime PTE types as measured by the SLESQ indicating the most optimal balance between sensitivity and specificity was 3.5 for a PTSD diagnosis. This is similar to the 4 event "risk threshold" found by Karam et al. (2014). While we know that count is not the sole determinant of PTE outcomes, this novel information indicates researchers and practicioners may give additional consideration to individuals who have experienced more than three lifetime PTE types especially in relation to PTSD severity.

Limitations, Implications, and Future Research

Some study limitations influence the interpretation of findings. First, the sample reflected a relatively limited demographic subset, consisting primarily of participants who were White, female, treatment-seeking, and provided study data with self-report measures. These sample characteristics (clinical, treatment-seeking) imply that participants were already experiencing distress, which means they may be less resilient than a community sample. Further, previous research

Table 3 Results of linear and quadratic regressions testing the dose-response and stress-inoculation hypotheses

Outcome variable	Linear			Quadratic		
	F (df)	B (*t*-value)	R^2	F (df)	B (*t*-value)	R^2
Total PTSD severity	34.25 (1113)	4.26 (5.85)**	.23	17.69 (1, 112)	.23 (1.05)	.24
Depression	11.22 (1, 112)	.80 (3.35)**	.09	5.75 (2, 111)	.04 (.59)	.09
DTS-Total score	4.43 (1, 110)	−1.12 (−2.10)*	.04	2.19 (2, 109)	.01 (.03)	.04
DTS-Tolerance	1.11 (1, 118)	−.13 (−1.05)	.01	.63 (2, 117)	.01 (.39)	.01
DTS-Absorption	4.14 (1, 120)	−.25 (−2.03)*	.03	2.15 (2, 119)	.02 (.44)	.04
DTS-Appraisal	6.20 (1, 116)	−.48 (−2.49)*	.05	3.11 (2, 115)	−.02 (.25)	.05
DTS-Regulation	4.12 (1, 117)	−.24 (−2.03)*	.03	2.01 (2, 116)	.01 (.30)	.04

N = 98–123 due to missing data on some variables.

DTS Distress Tolerance Scale.

*, p < .05; **, p < .01

does indicate that the negative impact of PTSD symptoms on memory may skew responses on self-report measures of event count (Kolassa and Elbert 2007; McNally 2006). Thus, future research with a more diverse sample, and collecting data using a multi-method approach would help to assess the generalizability of results. Second, PTSD was referenced in response to the most distressing event, which was not factored into the analyses. Third, we solely considered one aspect of traumatic experiences - the *count* of mulitple PTE types. From existing literature, we know that traumatic experiences need to be evaluated in terms of count, severity, frequency, timing of the occurrence, and subjective interpretations. Additonally, participants may have experienced an event, such as unwanted sexual contact, multiple times throughout their life but were only able to indicate having experienced such an event *ever* on the SLESQ. While we do not consider all these aspects, our results highlight the importance of assessing and addressing the count of lifetime PTE types rather than just focusing on the most distressing event to improve the efficacy and individualization of trauma-focused interventions. Future studies can use the current study analytical framework to promote the idea of comprehensively assessing all PTEs and their outcomes while considering other PTE characteristics.

Despite these limitations, our study results have several theoretical and clinical implications. First, our results provide support for the dose-response theory of traumatization compared to the stress-inoculation theory. Second, future research should consider that experiencing more than three lifetime PTE types may lead to significant distress, thus bringing a
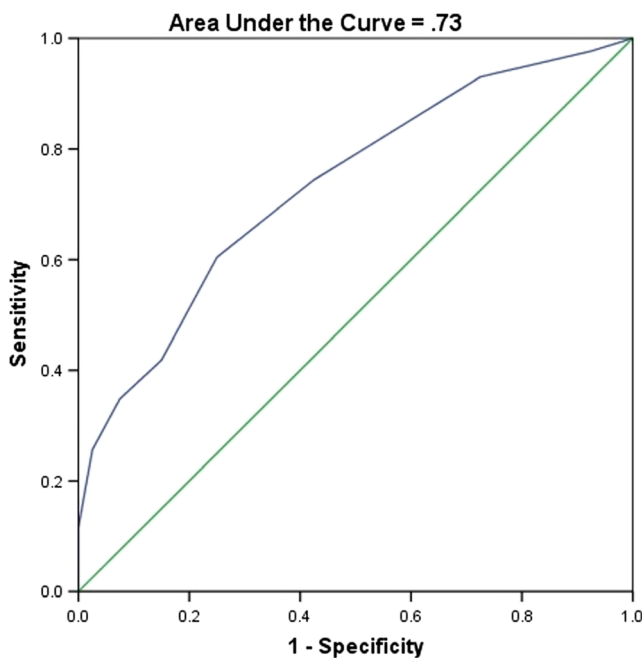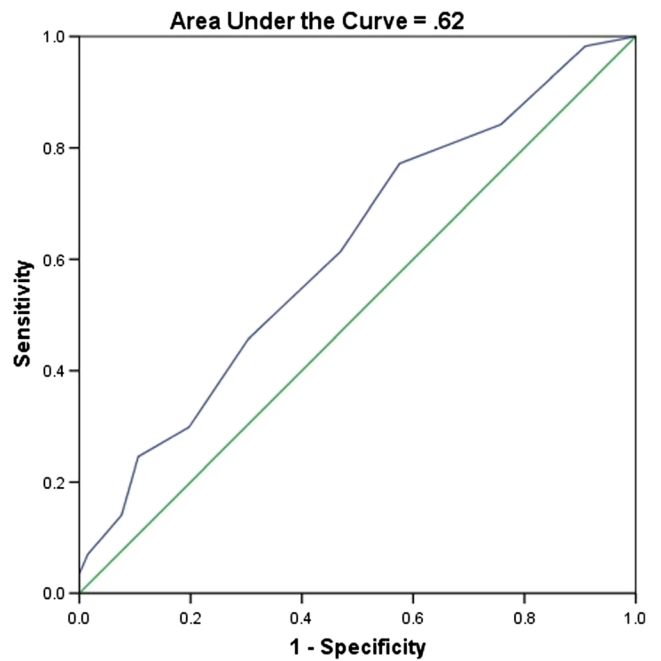

Fig. 2 Receiver operating curve of count of lifetime PTE type exposure predicting moderate clinical depression

greater focus to individuals' comprehensive trauma histories in research. Clinicians may also find it helpful to take a broader treatment focus in addressing multiple lifetime PTEs simultaneously, considering our finding of a 3.5 event threshold indicating significant distress. Individuals interpret

Fig. 1 Receiver operating curve of count of lifetime PTE type exposure predicting probable PTSD diagnosis

Table 4 Diagnostic efficiency statistics of the count of PTEs as measured by the SLESQ in relation to PTSD and depression

	Sensitivity	Specificity
PTSD Diagnostic Criteria		
Count of PTEs = .5	.98	.08
Count of PTEs = 1.5	.93	.28
Count of PTEs = 2.5	.84	.43
Count of PTEs = 3.5	.74	.58
Count of PTEs = 4.5	.61	.75
Depression Severity		
Count of PTEs = .5	.98	.09
Count of PTEs = 1.5	.84	.24
Count of PTEs = 2.5	.77	.42
Count of PTEs = 3.5	.61	.53
Count of PTEs = 4.5	.46	.70

PTSD diagnostic criteria defined as endorsing a score of 2 or greater on at least 1 Criterion B, 1 Criterion C, 2 Criterion D, and 2 Criterion E symptoms; moderate depression severity defined by PHQ-9 >= 10. Per SPSS default, the smallest cut-off value for PTE count is the minimum observed test value minus 1; all other cutoff values are the averages of two consecutive ordered observed test values

personal events uniquely using their own contextual frameworks and learning histories, meaning clinical presentations may result from a constellation of factors from different PTEs (Briere et al. 2016; Diamond et al. 2010; Herman 2012; Mollica et al. 1998). Third, the SLESQ assessment of count of PTE types predicted PTSD classification with moderate accuracy in the present sample. Researchers and clinicians may find the SLESQ a relatively easy and useful screening tool to increase the chances of identifying individuals with a PTSD diagnoses. In research, the obtained PTE information via the SLESQ may help identify participants in need of referrals for professional mental health care.

As the body of trauma literature continues to grow, it seems increasingly evident that individual reactions to lifetime events are contextually-based. While many effective tools exist for identifying individuals with trauma histories and numerous effective interventions exist for individuals with these histories, it is possible that oversimplified pictures of traumatic experiences have impeded progress in trauma research and care. Researchers and clinicians may find it worthwhile to take additional time and effort to consider multiple lifetime PTEs within the social, historical, and unique individual contexts, to foster health and recovery among those who are suffering.

Compliance with Ethical Standards

Conflict of Interest Monica Gerber, Sheila B. Frankfurt, Ateka A. Contractor, Kelsey Oudshoorn, Paula Dranger, and Lily Brown declare that they have no conflict of interest.

Experiment Participant This study was approved by a Midwestern university's Institutional Review Board. The present study is a secondary analysis of this larger dataset (see Contractor et al. 2017 for full study details). Participants were recruited from waiting rooms at a Midwest community mental health center. All paricipants completed informed consent and compensation for participation was not offered.

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