The Relationship Between Negative Expressivity, Anger, and PTSD Symptom Clusters

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1. Introduction

Posttraumatic stress disorder (PTSD) includes symptoms of intrusions, avoidance, negative alterations in cognition and mood (NACM), and hyperarousal, and is highly associated with negative emotions, (e.g., anger, negative behaviors; Renshaw and Kiddie, 2012). Most studies examining PTSD and anger have not differentiated between internal and external expressions of anger. Furthermore, there is a dearth of research investigating specific PTSD symptoms clusters' effects on internal and external anger expression.

Chemtob et al. (1997) postulate individuals with PTSD view external stimuli as threatening (even if they are neutral), leading an individual to react with physiological arousal and anger, which can lead to negative behaviors. Alternatively, fear avoidance theory (Foa et al., 1995) posits anger functions as an avoidant coping mechanism; specifically, an individual faced with trauma-related stimuli will react with anger to avoid dealing with fear, leading to ineffective emotional processing and increased chances of engaging in problematic behavior secondary to their internal anger experience. To our knowledge, one study (examining combat veterans) examined PTSD's direct and indirect effects on negative behaviors (e.g., aggression) utilizing anger as a mediator (Renshaw and Kiddie, 2012). This study suggested PTSD symptoms elicit internal feelings of anger, which lead to heightened levels of negative overt behavior.

In this study, Gross and John's (1997) emotion-generative model comprises three domains: impulse strength (the degree one responds internally to an emotional stimulus), and positive or negative expressivity (how strongly positive/negative behavior is conveyed in response to a positive or negative emotion, respectively).

Theoretically, when considering negative expressivity and Chemtob et al.'s (1997) model, individuals with PTSD should perceive trauma-related stimuli or intrusive symptoms as

threatening, heightening hyperarousal symptoms and anger. Anger secondary to PTSD may lead to increased negative expressivity. Considering fear avoidance theory (Foa et al., 1995) and negative expressivity, individuals with more avoidance may react with anger to avoid fear associated with intrusive stimuli (or PTSD's intrusive symptoms), resulting in heightened negative expressivity. We hypothesize: 1) PTSD's hyperarousal, avoidance, and intrusions clusters will be associated with heightened negative expressivity, and 2) anger will mediate this relationship.

2. Method

2.1 Participants and Procedures

This study was approved by a Midwestern U.S. university's Institutional Review Board. Trained staff received informed consent from 117 individuals seeking mental healthcare at a community mental health center in the Midwestern U.S. Our sample was restricted to those endorsing prior trauma exposure ($N = 57$), composed of the following demographics: female, ($n = 39$; 68%), age 18-71 years old ($M = 35.29$, $SD = 12.25$), Caucasian ($n = 52$; 91%), married (35%; $n = 19$) or single (31%; $n = 17$), and having high school education or less (42%; $n = 23$), or at least some college (57%; $n = 32$).

2.2 Measures

The 13-item *Stressful Life Events Screening Questionnaire* (SLESQ; Goodman et al., 1998), assessed lifetime traumatic event exposure on a "yes" or "no" response scale. The SLESQ has shown good overall test-retest reliability (0.89), and concurrent and convergent validity (Goodman et al., 1998). Participants indicated their most distressing event, and rated symptoms using the PTSD Checklist for DSM-5.

The 20-item *PTSD Checklist* for DSM-5 (PCL-5; Weathers et al., 2013) was used to assess PTSD symptoms. The PCL-5 has a 5-point scale ranging from 0 to 4. The initial PCL demonstrated good reliability (α =0.94; test–retest r =0.88). In this study, internal consistency was excellent (α = 0.97).

The 16-item *Berkeley Expressivity Questionnaire* (BEQ; Gross and John, 1997) assessed dimensions of emotional expression. We focused on the negative expressivity subscale (BEQ-N), which is comprised of 6 items. The measure has a 7-point scale from 1 to 7. Internal consistency, test-retest reliability, and convergent and discriminant validity of the BEQ are adequate to excellent (Gross and John, 1997). In this study, BEQ-N showed adequate internal consistency (α = 0.70).

The 5-item *Dimensions of Anger Reaction Scale – 5* (DAR-5; Forbes et al., 2014) was used to measure anger reactions in response to stress. The DAR-5 has a 5-point scale from 1 to 5 and good internal consistency (α = 0.89), and good convergent and discriminant validity (Forbes et al., 2014). In this study, internal consistency was excellent (α = 0.91).

2.3 Data Analysis

Two participants were excluded due to incomplete study measures ($n = 55$). Missing data were estimated using maximum likelihood estimation. All variables were normally distributed, and were non-collinear. All correlations between variables are presented in Table 1. Multiple regression was completed to assess which PTSD symptom cluster most strongly predicted negative expressivity. One regression was computed with all four PTSD symptom clusters entered simultaneously as predictors. Regressions controlled for the associations between PTSD factors. Negative expressivity was the dependent variable. After finding significant direct effects,

we used the PROCESS SPSS macro for Model 4 (see Hayes, 2013) to assess for anger as a

mediator.

3. **Results**

Regression results (see Figure 1) revealed significant main effects for the intrusive

symptom (β = -0.556, t(54) = -2.12, p = 0.039) and avoidance symptoms clusters (β = 0.769,

t(54) = 2.81, p = 0.007). There were no significant main effects for the NACM symptom (β =

0.346, t(54) = -1.087, p = 0.282) and the hyperarousal symptom clusters (β = 0.165, t(54) =

0.625, p = 0.535). Participants with lowered intrusion severity displayed more negative

expressivity; participants with elevated avoidance conveyed more negative expressivity.

Mediation analyses revealed anger fully mediated relations between intrusive symptoms and

negative expressivity (t = 2.528, p = 0.015, *lower CI* = 0.018, *upper CI* = 0.16, overall model R^2

= 0.39). Anger did *not* significantly mediate relations between avoidance and negative

expressivity (overall R^2 = 0.07).

4. **Discussion**

Although hypotheses were partially confirmed in that individuals with heightened

avoidance endorsed higher levels of negative expressivity, anger did not mediate this

relationship; however, Foa et al. (1995) posit that anger is an avoidant reaction to fear associated

with traumatic stimuli. Anger may merely be an extension of, rather than a direct reaction to,

PTSD's avoidance symptoms (hence, lack of a mediating effect).

The large effect size for lowered intrusions resulting in heightened negative expressivity

through anger's mediation is surprising; however, we are unsure of the temporal relations

between the experience of PTSD symptoms and participants' identified trauma. Therefore, if a

person experiences initial levels of intrusion symptoms following a trauma, s/he could

experience more severe anger reactions due to the recent nature of the trauma, leading to more overt expressions of negative behavior. Future longitudinal work could tease apart the temporal relationship between these constructs.

The lack of hyperarousal symptoms' effects on negative expressivity could have been impacted by our sample size, because hyperarousal in past research has related to anger and aggression (e.g., Dewey et al., 2014).

This study carries clinical implications. Specifically, PTSD's intrusive symptoms indirect effect on negative expressivity through anger suggests that implementation of anger management protocols into PTSD-focused treatments could be helpful. The major strength of our study is that it is one of few examining specific DSM–5 PTSD symptom clusters' relationships with internal anger and expression of negative behaviors in response to anger in a civilian treatment-seeking sample.

Limitations include: reliance on self-report data, assessment of negative expressivity rather than behaviors specific to anger (e.g., violence), the study's small sample size, and the cross-sectional nature of data did not allow for causal inference. Future research addressing the limitations is needed to further understand the relationship between PTSD, anger, and emotion expression.

Conflict of Interest

We wish to draw the Editor's attention to the following facts, which may be considered as potential conflicts of interest, and to financial contributions to this work. One coauthor, Jon Elhai, received financial support in the form of editorship fees from Elsevier Foundation, royalties from John Wiley and Sons, Other (occasional fees as an expert witness in court), and the Menninger Clinic. He also received financial support in the form of a Grant from DoD (W81XHW-07-1-0409) and NIH (1R21MH098198-01A1) accounting for 5% of his salary. Li Wang's work was supported by grants from the Ministry of Science and Technology of the People's Republic of China (No.2013BAI08B02), the Chinese Academy of Sciences (No. KJZD-EW-L04), and the National Natural Science Foundation of China (No.31271099, 31471004). No other co-authors have potential conflicts of interest to disclose and there has been no significant financial support for this work that could have influenced its outcome.

We confirm that the manuscript has been read and approved by all named authors and that there are no other persons who satisfied the criteria for authorship but are not listed. We further confirm that the order of authors listed in the manuscript has been approved by all of us.

We confirm that we have given due consideration to the protection of intellectual property associated with this work and that there are no impediments to publication, including the timing of publication, with respect to intellectual property. In so doing we confirm that we have followed the regulations of our institutions concerning intellectual property.

We further confirm that any aspect of the work covered in this manuscript that has involved human patients has been conducted with the ethical approval of all relevant bodies and that such approvals are acknowledged within the manuscript.

Role of the Funding Source

The research presented in this manuscript was unfunded; therefore, no sponsor of any kind had a role in study design, data collection, analysis, interpretation of results, report writing, or manuscript submission.

Contributions

All authors contributed to and have approved the final manuscript.

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at www.ptsd.va.gov.

Table 1

Correlations between PTSD symptom clusters, anger, and negative expressivity

	1	2	3	4	5	6
1. PTSD-B: Intrusions	1.00	0.836^{***}	0.832^{***}	0.764^{***}	-0.076	0.416^{***}
2. PTSD-C: Avoidance		1.00	0.844^{***}	0.787^{***}	0.140	0.488^{***}
3. PTSD-D: [1]NACM			1.00	0.863^{***}	-0.018	0.476^{***}
4. PTSD-E: Hyperarousal				1.00	0.045	0.588^{***}
5. BEQ-N[2]					1.00	0.269^{*}
6. Anger						1.00
M (*SD*)	12.32 (4.87)	5.12 (2.75)	17.34 (8.09)	14.27 (7.18)	3.75 (1.18)	11.33 (4.96)

Note. *** $p < 0.01$, * $p < 0.05$; [1]Negative Alterations in Cognitions and Mood, [2]Negative Expressivity