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Peritraumatic and Persistent Dissociation as Predictors of PTSD Symptoms in a Female Cohort

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Abstract

Recent research has investigated peritraumatic and persistent dissociation as a possible predictive factor for posttraumatic stress disorder (PTSD). The current study aims to add to this literature by examining dissociative responses in female assault survivors ($N = 92$ initial assessment; $n = 62$ follow-up). Dissociative symptoms experienced at 3 time points were assessed: peritraumatic dissociation, persistent dissociation - initial ($M = 28.2$ days post trauma) and follow-up ($M = 224.9$ days post trauma) as well as initial and follow-up PTSD symptoms. We hypothesized that peritraumatic dissociation and persistent dissociative symptoms would predict chronic PTSD symptoms at the follow-up assessment with initial PTSD symptoms and assault type in the model. Hierarchical regression resulted in a significant model predicting 39% of the variance in follow-up PTSD symptom scores, $p < .001$. Both peritraumatic and follow-up persistent dissociative symptoms significantly and uniquely added to the variance explained in follow-up PTSD symptom score contributing 4% ($p = .05$) and 8% ($p = .008$) of variance respectively. Results support the predictive value of peritraumatic and persistent dissociative symptoms, and the findings suggest that persistent dissociation may contribute to the development and continuation of PTSD symptoms. We discuss the implications for assessment and possible treatment of PTSD as well as future directions.

Dissociative symptoms have long been under investigation as important reactions that occur during the course of or after a traumatic event. Symptoms such as amnesia, depersonalization, and derealization have been researched as both a psychological protective mechanism (Breuer & Freud, 1940) and a psychological deficit (Janet, 1907). Many trauma survivors experience dissociative reactions during or immediately after the trauma; this is commonly referred to as peritraumatic dissociation (PD) (Marmar et al., 1994). Research suggests PD may have an effect on cognitive encoding and memory formation of the traumatic experience; this may lead to later development of psychopathology (Holen, 1993). The Freudian approach suggests dissociation protects the psyche during a particularly distressing and painful experience (Spiegel, 1991). Recent investigation, however, of two competing models focused on the relationship between peritraumatic distress and dissociation revealed peritraumatic dissociation was positively correlated with peritraumatic distress, and a large percentage of those who experienced high levels of dissociation also

endorsed high levels of distress during the trauma (Fikretoglu et al., 2006). Elevated dissociative symptoms have also been found in those who go on to develop posttraumatic stress disorder (PTSD) after a trauma (Bremner et al., 1992).

Peritraumatic dissociative reactions have been found to be predictive of PTSD and posttraumatic stress symptoms (Koopman, Classen, & Spiegel, 1994; Birmes et al., 2003) and a recent meta-analysis found PD as one of the strongest predictors of PTSD (Ozer, Best, Lipsey, & Weiss, 2003). Other studies have found PD only weakly predicts PTSD (Van der Hart, van Ochten, van Son, Steele, & Lensevelt-Mulders, 2008) or is no longer predictive once persistent dissociation is accounted for (Briere, Scott, & Weathers, 2005; Van der Velden & Wittmann, 2008). In a recent chapter, Bryant (2009) argues most peritraumatic dissociation is adaptive while persisting dissociation is pathological. Murray, Ehlers, and Mayou (2002) found persistent dissociation – dissociative symptoms that occur after the traumatic event and continue to the present – at 4 weeks, assessed with the state dissociation questionnaire, predicted 6 month PTSD severity beyond initial dissociation in both inpatient ($N = 27$; $r = .64$) and outpatient ($N = 439$; $r = .55$) samples. In a separate report by Halligan, Michael, Clark and Ehlers (2003) elevated levels of persistent dissociation were reported in assault survivors who maintained a PTSD diagnosis; these findings were supported by a second prospective study of physical or sexual assault survivors ($N = 73$) indicating persistent dissociation added a unique 8% of variance beyond the amount explained by severity of trauma, traumatic memory deficits, and cognitive processing during the assault (Halligan, et al, 2003). These studies indicate the importance of persistent dissociation in the development and maintenance of PTSD.

Studies examining both peritraumatic dissociation and persistent dissociation concurrently suggest that persistent dissociation rather than peritraumatic dissociation is a substantial predictor of posttraumatic symptoms (Panasetis & Bryant, 2003) and PTSD diagnosis (Briere et al., 2005). Briere and colleagues (2005) concluded “the primary risk for PTSD is less whether one dissociates during the traumatic event, than whether such dissociation persists over time” (p. 2299). These studies suggest persistent dissociation has a unique influence on posttraumatic pathology. Persistent dissociation may block normal memory consolidation posttrauma and lead to the development of psychopathology. Research has found that traumatic memories can become distorted over time (Schwartz, Kowalski, & McNally, 1993). Persistent dissociation may serve as a cognitive avoidance mechanism as opposed to active behavioral avoidance – a symptom of PTSD. The relationship of peritraumatic and persistent dissociative reactions with PTSD warrants further prospective investigation.

In the laboratory, idiosyncratic trauma-related cues can induce trauma related memories, and dissociative symptoms related to trauma recall can be measured. Thus a state of trauma specific persistent dissociation can be assessed. The present study sought to assess peritraumatic dissociation as well as persistent traumatic responses to individual index trauma recall at two time points. by investigating dissociative symptoms prospectively in a traumatized non-treatment seeking female cohort. Specifically, we assessed peritraumatic dissociation, persistent dissociation in the acute aftermath of trauma exposure, and persistent dissociation at a follow-up assessment. We hypothesized that peritraumatic dissociation and

acute persistent dissociative symptoms would predict chronic PTSD symptoms at the follow-up assessment with initial PTSD symptoms and assault type in the model.

Method

Participants

The participants for this study part of a larger sample of 92 non-treatment seeking female survivors of first degree physical ($n = 73$) and sexual assault ($n = 19$). First degree assault, as it pertains to both physical and sexual assault, was defined as the crime of assault in which the attacker attempted to kill or knowingly inflict serious physical harm on the victim (Offenses against a Person, 2010). Participants were recruited through local police departments, circuit attorney's victim services division, and other victim assistance agencies in a large metropolitan area. Participants were initially assessed ($M = 28.2$ days posttrauma, $SD = 15.3$, Range = 5 – 87 days) after the trauma and again at a follow-up assessment ($M = 224.9$ days posttrauma, $SD = 92.6$, Range = 160 – 796 days). Participants were excluded from the study for the following: active suicidality ($n = 0$), current psychosis or a history of chronic psychotic illness ($n = 1$), intoxication with drugs or alcohol at the time of the assessment ($n = 1$), and illiteracy ($n = 1$). For the follow-up assessment, only 62 (67%) of the original study participants were able to be reached or agreed to be participant in the second assessment. The study protocol was approved by the Institutional Review Board at University of Missouri–St. Louis and all participants gave written informed consent prior to beginning the study. Participants were paid \$60 for the initial assessment and \$80 for the follow-up assessment.

The 62 participants who completed both assessments comprised the study sample. They did not differ from the dropout group on any demographic characteristics including age ($t(90) = .54, p = .59$), race ($\chi^2(2, N = 92) = .93, p = .63$), education ($t(90) = .09, p = .93$), income ($t(89) = .13, p = .90$) or marital status ($\chi^2(2, N = 91) = 6.11, p = .30$), assault type ($\chi^2(1, N = 92) = .06, p = .81$), or dissociative symptom measures – peritraumatic dissociation ($t(89) = .21, p = .84$), initial persistent dissociation ($t(88) = .64, p = .53$). The completers were found to have significantly lower PTSD symptoms at the initial assessment, ($M = 57.31, SD = 25.7$ vs. $M = 69.56, SD = 27.1, t(90) = 2.36, p = .02$), consistent with previous comparisons in this female traumatized cohort (Valentiner, Foa, Riggs & Gershuny, 1996). The analyses reported in this paper only include the participants who completed both assessments.

Participants were predominately African-American (71%) and Caucasian (24%) and from low-income households (43% less than \$5,000 yearly income). Ages ranged from 18 to 77 years with an average age of 35.2 years ($SD = 12.0$ years). Most participants were single (46%) and had received an average education of 12.4 years ($SD = 2.3$ years).

Measures

All participants completed a standardized trauma interview to collect demographic information, information about the crime, prior trauma history, and treatment history. Each participant's assault type was coded physical or sexual assault based on the information provided by the trauma interview. Participants were assessed for PTSD symptoms at both

time points using the Clinician-Administered PTSD Scale (CAPS; Blake et al. 1990). The initial assessment with the CAPS was completed using the 1-week symptom status version (CAPS-SX), but the follow-up visit CAPS assessment was completed using the current and lifetime diagnosis version (CAPS-DX). The CAPS is a reliable and valid measure of PTSD symptomatology and diagnosis; in the current sample, internal consistency for the CAPS-SX ($\alpha = .84$) and CAPS-DX ($\alpha = .89$) was found to be high and data distribution for both measures were normal. Both versions of the CAPS provide subscale scores for each symptom cluster, hyper-arousal, re-experiencing, and avoidance and a total symptom score. Both the CAPS-SX and the CAPS-DX query the same symptom intensity and frequency, however the CAPS-SX has different time frame values (0 = *never*, 1 = *once*, 2 = *two or three times*, 3 = *four or five times*, 4 = *daily*) than the CAPS-DX (0 = *never*, 1 = *once or twice*, 2 = *once or twice a week*, 3 = *several times a week*, 4 = *daily or almost every day*). Many of the participants were initially assessed for PTSD symptoms prior to the 4 week time requirement for a PTSD diagnosis in the Diagnostic and Statistical Manual of Mental Disorders (APA, 1994). For the purpose of the current study, symptoms scores for both measures were used for analysis.

The Peritraumatic Dissociative Experiences Questionnaire – rater version (PDEQ, Marmar et al., 1994) was used to assess peritraumatic dissociation at the initial assessment. This is an interviewer based 8-item questionnaire designed to assess dissociative symptoms a person may experience during the traumatic event. Symptoms measured include depersonalization, derealization, and traumatic amnesia. Each item is measured on a 0-4 scale with a minimum total score of 0 and maximum 32 possible. The PDEQ – rater versions was validated in civilian trauma survivors (Shalev, Freedman, Peri, Brandes & Sahar, 1997) and internal consistency has been demonstrated in previous studies (Marmar, Weiss & Metzler 1998). In this sample, internal consistency was found to be .68 and the scores were normally distributed.

At the initial assessment and again at the follow-up assessment, approximately 2 hours after completing self-report and clinically administered measures, each participant was asked to recall their specific index trauma event for 5 minutes. Participants were given a trauma prompt sheet to suggest information to discuss about the assault: (a) the time of day of the assault; (b) where the assault took place; (c) the activity the participant was engaged in at the time of the attack; (d) the approach taken by the assailant; (e) what the assailant said; (f) what the assailant did during the assault; (g) how the participant responded in terms of thoughts, reactions, and actions taken; (h) what was the assailant wearing; (g) any noises, smells, or sensations the participant may have experienced; and (h) how the attack came to an end. Participants used the prompt sheet as needed.

After the 5-minutes of traumatic recall, the participant's trauma-specific persistent dissociative symptoms were assessed with the Clinician-Administered Dissociative States Scale CADSS; Bremner et al., 1998). The CADSS is a 27-item measure of present-state dissociative symptoms including 19 participant rated items and 8 observer scored items measured on a Likert scale from 0 to 4: 0 = *not at all*, 1 = *slightly*, 2 = *moderately*, 3 = *considerably*, 4 = *extremely*. A clinician asked each question beginning with “At this time” and then administered each item. The clinician recorded the result and moved to the next

question; at the same time, the clinician observed the participant's behavioral response while answering the subjective questions. The clinician then scored the 8 observer items. The participants completed this procedure, including the 5-minutes of trauma recall, at both the initial and follow-up assessments. The CADSS includes items to assess amnesia, depersonalization, and derealization. The CADSS has shown good internal consistency, validity, and reliability in previous studies (Bremner et al., 1998) and high internal consistency was found in this sample at both time points (Cronbach's $\alpha = .89$ and $.86$). Data collected at the initial and follow-up assessment were found to be non-normally distributed; transformations to address this issue are discussed below.

Data Analysis

Analyses were performed using SPSS version 19 for evaluation of assumptions and multivariate statistical analysis. Exploratory analysis indicated both the CADSS initial and follow-up data to be non-normally distributed and positively skewed. Further analysis indicated no difference in distributional function across PTSD diagnostic status for the CADSS either at the initial or follow-up assessment. A square root transformation was used at both time points for the CADSS to reduce skew and improve the normality of the distribution. Missing data were found to be 3.2% of the total data and missing completely at random (Little's MCAR test: $\chi^2 = 14.06, p = .23$). Maximum likelihood estimates using the expectation maximization algorithm were employed to compute values for the missing data prior to regression analysis (Allison, 2001).

To assess the independent predictive value of each measure of dissociation for PTSD, hierarchical regression was used to the predictive value of PTSD symptom scores at the follow-up visit. No multivariate outliers were identified and multicollinearity was not found for variables included in the analysis as described by variance inflation factors and tolerance. Both assault type and initial PTSD symptoms were entered in the first step of the regression analysis. Previous research has found assault type to have an effect on dissociative symptoms and PTSD development: sexual assault and rape have previously been associated with higher rates of PTSD and increased emotional responses, (Kessler, Sonnega, Bromet, Hughes, & Nelson, 1995; Amstadter & Vernon, 2009). Dissociation has been reported as a risk factor for PTSD and sexual assault victims experience increased levels of PTSD (Breh & Seidler, 2007; Kessler et al., 1995). Initial PTSD symptoms have consistently been found to be a strong predictor of later PTSD symptomatology and development. The complete model for predicting PTSD symptom scores at follow-up was as follows: at step 1 assault type, and baseline PTSD symptoms were entered, at step 2 peritraumatic dissociation scores were entered, at step 3 baseline persistent dissociation was entered, and at step 4 follow-up values of persistent dissociation was entered.

Results

Analysis of the correlation matrix indicated significant relationships between all variables included in the regression (Table 1). As expected, initial PTSD symptom scores were positively correlated with PTSD symptom scores at follow-up ($r = .56, p < .001$). Strong to moderate relationships were found between all other variables with the exception of

persistent dissociation at follow-up and initial PTSD symptoms and with peritraumatic dissociation and follow-up persistent dissociation which were only weakly correlated.

The complete model was found to be significantly different from zero at each step, and after step 4, with all variables entered, $F(5, 56) = 8.62, p < .001$. The adjusted R^2 value, indicated 39% of the variability in PTSD symptoms at 7 months posttrauma was predicted by initial PTSD symptoms, peritraumatic dissociation and persistent dissociation at follow-up. Control variables of assault type and initial PTSD symptoms accounted for a 31% of the variance in follow-up PTSD symptoms, $F(2,59) = 13.37, p < .001$. Peritraumatic dissociative symptoms were added in step 2 and significantly added to the prediction of chronic PTSD symptoms, $F(1, 58) = 3.92, p = .05$. The addition of persistent dissociative symptoms at the initial assessment in step three did not significantly improve prediction of chronic PTSD symptoms, $F(1,57) = .28, p = .60$. Persistent dissociative symptoms at the follow-up assessment added in the final step resulted in a significant addition to the explained variance, $F(1,56) = 7.57, p = .008$. These results indicate peritraumatic and persistent dissociation at the follow-up assessment independently added modestly to the prediction of PTSD symptom scores at 7 months with for assault type and initial PTSD symptoms. Peritraumatic dissociation added a unique 4% of variance and persistent dissociation – follow-up contributed a unique 8% of variance to the model. Persistent dissociation as measured at the initial assessment was not a significant predictor.

Discussion

The results of the current study support previous research linking peritraumatic dissociation and persistent dissociation to post traumatic morbidity (Ozer et al., 2008; Briere et al., 2005; Panasetis & Bryant, 2003). These findings support studies that have identified persistent dissociation as a more substantial predictor than peritraumatic dissociation for PTSD (Briere et al., 2005) and posttraumatic stress symptoms (Panasetis & Bryant, 2003). Peritraumatic dissociation and persistent dissociation at follow-up were found to be predictors of posttraumatic stress symptoms and each contributed unique variance to the model that significantly improved prediction of chronic PTSD symptoms an average of seven months posttrauma. Peritraumatic dissociation measured at the initial assessment predicted a moderate amount of variance in chronic PTSD symptom scores (4%); persistent dissociation also added a moderate amount of variance (8%) above and beyond control variables and in addition to the variance explained by peritraumatic dissociation. Although neither account for a larger amount of variance than initial PTSD symptoms in the complete model, results remain informative suggesting both peritraumatic and continued dissociation posttrauma play a part in psychopathological development. These findings identify persistent dissociation as a distinctive post traumatic reaction and support the importance of assessing persistent dissociative symptoms as well as peritraumatic reactions.

The current findings have significant implications for the progression of posttraumatic symptoms. The relationship of peritraumatic dissociation and PTSD has been well established in the literature, however many of the findings may be confounded by retrospective report of peritraumatic responses. Persistent dissociative symptoms may be more important to pathological development. The finding of significant but only moderate

correlations between measurements of peritraumatic and persistent dissociation at the follow-up assessment indicate dissociative experiences may continue to change after the trauma has occurred. Findings support Bryant's theory (2009) that peritraumatic dissociation and persistent dissociation are distinct dissociative reactions and continued persistent dissociation is pathological. Peritraumatic and persistent dissociative symptoms both added predictive value to the model. Although these reactions are similar, they occur at differential time points. Both measures of dissociative reactions include items to query derealization, numbing, time speeding up or slowing down, changes in bodily sensation. Although the current findings show value for both peritraumatic and persistent dissociation, the evolution of these symptoms is unknown. Further investigation of changes in dissociative symptoms is warranted in order to better comment on the progression of dissociative symptoms across time.

These findings have clinical implications for the treatment of PTSD. Assessment of both peritraumatic and persistent dissociative symptoms after a trauma may help identify those at highest risk for PTSD development. Trauma survivors with peritraumatic and persistent dissociative symptoms over time are also more likely to continue exhibiting PTSD symptoms and are likely in the most need of treatment. The current study does not investigate the impact of persistent dissociation on the efficacy of treatment. Persistent dissociative reactions to trauma reactivation, however, could serve as a barrier to effective treatment. Exposure treatments often employ imaginal and in vivo exposure to traumatic memories in a controlled setting. Persistent dissociative reactions to traumatic memories during exposure may reduce emotional engagement during treatment and adversely affect treatment gains. Ehlers and Clark (2000) suggest that dissociative symptoms may interfere with expansion on the traumatic memory and integration into autobiographical memory. Recent research investigating the dissociative constructs depersonalization and numbing found no difference in treatment efficacy between high and low depersonalization groups and increased treatment efficacy in the participants with high numbing symptoms (Hagenaars, Minnen, & Hoogduin, 2010). All dissociative constructs, however, were not considered in concert in this study. Further research investigating peritraumatic and persistent dissociative symptoms effect on the efficacy of cognitive and exposure therapies would give better insight into this relationship.

A strength of this study is the prospective assessment across time points and an arguably short time lapse between the trauma and the initial assessment ($M = 28.2$ days) to assess peritraumatic reactions and acute posttraumatic stress symptoms. Assessing survivors soon after a trauma is often difficult as evidenced by the relative paucity of studies of acute trauma reactions. Consequently, retrospective reports of peritraumatic reactions are often collected and these peritraumatic response scores have been found to be less stable across time points within an unremitting PTSD cohort (David, Akerib, Gaston & Brunet, 2010). Although we attempted to capture peritraumatic reactions as soon as possible after the trauma, this assessment timeframe for peritraumatic reactions is still retrospective across participants. All data were collected at two assessment times; peritraumatic and initial persistent dissociative symptom assessments were administered within hours of each other. This short time lapse between assessments could partially account for the moderate

correlation ($r = .42, p < .001$) between measures and the therefore non-significant contribution of initial persistent dissociative symptoms in the regression model. Future longitudinal research should include a more acute assessment time point to better measure peritraumatic responses immediately after trauma exposure.

Multiple assessments allowed for the ability to investigate the temporal relationship between dissociative symptoms and PTSD – specifically the predictive value of persistent dissociation across time. Examination of the effects of persistent dissociation across a longer time frame, however, could offer a deeper understanding into the pathology of chronic PTSD. Persistent dissociative symptoms could affect individual PTSD symptom clusters differently or reduce efficacy of some treatments if not addressed. Research focused on the effects of persistent dissociative symptoms long after a trauma would be beneficial to the field.

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Table 1
Means, Standard Deviations, and Correlations of Symptoms and Dissociation

Variable	M	SD	1	2	3	4	5
CAPS Diagnosis at Follow-up	38.47	27.96	-	.56***	.48***	.41**	.45***
CAPS 1 Week at Initial	57.31	25.75	.56***	-	.56***	.62***	.29*
PDEQ	12.11	6.05	.48***	.56***	-	.42***	.29*
CADSS Initial ^a	2.08	1.70	.41**	.62***	.42***	-	.57***
CADSS Follow-up ^a	1.45	1.41	.45***	.29*	.29*	.57***	-

Note. N = 62; CAPS 1 Week (Clinician-Administered PTSD Scale – 1 week symptom status version) at T1; CAPS Diagnosis (Clinician-Administered PTSD Scale – current and lifetime diagnosis) at T2; PDEQ (Peritraumatic Dissociation Experiences Questionnaire) at T1; CADSS (Clinician-Administered Dissociative States Scale)

^a Square root transformation used.

* p < .05;

** p < .01;

*** p < .001

Table 2
Hierarchical Regression Model Predicting PTSD Symptomatology at Follow-up Assessment Controlling for Assault Type and Initial PTSD Symptoms

	<i>R</i> ²	<i>R</i> ²	<i>B</i>	<i>SE B</i>	β
Dependent Variable: CAPS Diagnosis – Symptom Score					
Step 1	.31***				
Assault Type		3.63	8.14	.05	
CAPS 1 Week at Initial		.62	.12	.57***	
Step 2	.36***	.04*			
Assault Type		5.22	7.99	.072	
CAPS 1 Week at Initial		.47	.14	.43**	
PDEQ		1.17	.59	.25*	
Step 3	.36***	.00			
Assault Type		5.08	8.04	.07	
CAPS 1 Week at Initial		.43	.16	.39*	
PDEQ		1.13	.60	.25	
CADSS at Initial ^a		1.17	2.24	.07	
Step 4	.44***	.08***			
Assault Type		1.29	7.74	.02	
CAPS 1 Week at Initial		.48	.16	.44***	
PDEQ		.91	.57	.20	
CADSS at Initial ^a		-2.32	2.46	-.14	
CADSS at Follow-up ^a		6.85	2.49	.35***	

Note. *N* = 62; CAPS 1 Week (Clinician-Administered PTSD Scale – 1 week symptom status version) at T1; CAPS Diagnosis (Clinician-Administered PTSD Scale – current and lifetime diagnosis) at T2; PDEQ (Peritraumatic Dissociation Experiences Questionnaire) at T1; CADSS (Clinician-Administered Dissociative States Scale)

^a Square root transformation used.

* *p* < .05;

** *p* < .01;

100 > *d*

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