

## Research report

## Latent profiles of PTSD symptoms in women exposed to intimate partner violence

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## ABSTRACT

**Background:** Studies have utilized latent class analysis (LCA) and latent profile analysis (LPA) to examine posttraumatic stress disorder (PTSD) symptom profiles in a range of populations. Further study is needed to explore symptom profiles among women exposed to intimate partner violence (IPV). The current study examined latent symptom profiles in a sample of IPV-exposed women, and explored trauma-related cognitive appraisals associated with these PTSD symptom presentations.

**Methods:** An LPA was conducted using cross-sectional data from a non-treatment seeking community sample of women recruited following a police-reported incident of IPV by a male perpetrator ( $N=229$ ). Multinomial regression analyses determined associations between latent profile membership and trauma-related appraisals.

**Results:** The LPA identified five PTSD symptom profiles: Low Symptom (46% of the sample); Low Symptom with High Hypervigilance (17%); Intermediate Symptom (16%); Intermediate Symptom with High Hypervigilance (11%); and High Symptom (10%). Trauma-related appraisals, including fear, alienation, and self-blame, were the strongest independent predictors of PTSD symptom profile membership.

**Limitations:** The study focused on female victims of IPV by a male partner, and findings may not generalize to other gender configurations (e.g. same-sex couples, male victims, etc.). The LPA is cross-sectional, and the stability of these profiles over time warrants further study.

**Conclusions:** These findings suggest the need for careful consideration of differences among IPV-exposed women within the larger context of PTSD research and clinical intervention. Identifying latent subgroups may provide an empirical basis for practitioners to design and implement PTSD intervention efforts that are tailored to specific symptom profiles.

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## 1. Introduction

In the United States, intimate partner violence (IPV) is a substantial public health problem: over 1.3 million women are physically assaulted by a romantic partner every year, and between 25% and 33% of women will be physically assaulted by a romantic partner within their lifetime (Black et al., 2011; Tjaden and Thoennes, 1998). In 2007, nearly two-thirds of women who reported sexual or physical assault in adulthood were victimized by an intimate partner, and intimate partners perpetrated 23% of violent crimes against females and 3% of violent crimes against males (National Center for Victims of Crime, 2011). Following IPV, posttraumatic stress disorder (PTSD) is

one of the most prevalent disorders among women (Campbell, 2002; Golding, 1999), with rates of PTSD in clinical and nonclinical samples estimated to range between 21 and 64% (Cohen et al., 2013; Dutton, 2009; Nixon et al., 2004). PTSD symptoms can emerge in different configurations, which may have implications for treatment. For example, women who report severe PTSD symptoms overall may be more likely to seek treatment due to greater clinical need and functional impairment, while women who report elevation on certain sets of symptoms (e.g., symptoms related to emotional numbing) may be less likely to seek treatment (Hebenstreit et al., submitted for publication). Thus, research is needed to characterize the varying ways in which women exposed to IPV report trauma-related symptoms.

Research has highlighted the importance of a flexible and victim-centered approach that takes into account diversity among women exposed to IPV, rather than a “one size fits all” response that may not meet the specific needs of each woman (DePrince et al., 2012a,

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2012b; Goodman and Epstein, 2005). Unfortunately, most research on PTSD symptoms following IPV has relied nearly exclusively on variable-oriented research methods, which presume that the sample is relatively homogenous, and may fail to fully capture important differences between individuals (Bogat et al., 2005; Nurius and Macy, 2010). Fortunately, person-oriented analyses such as latent class analysis (LCA) and latent profile analysis (LPA) are rooted in the assumption that a given sample is heterogeneous, and these analyses identify smaller groups who share inter- and intra-individual similarities related to specific characteristics. By identifying latent subgroups, these approaches may provide an empirical basis for practitioners to design and implement PTSD intervention efforts that are tailored to specific symptom profiles.

Several studies have used LCA and LPA to identify subgroups of individuals within a larger sample who share similar patterns of PTSD symptom endorsement. LCA (used for binary indicators) and LPA (a form of LCA that is used for continuous indicators) both fit latent profile models to the data, and participants are classified as belonging to the profile with the best fit. Studies have utilized LCA and LPA to examine PTSD symptom classes in a range of populations, including trauma-exposed community samples (Ayer et al., 2011; Breslau et al., 2005), female sexual assault survivors (Au et al., 2013), and adult survivors of childhood abuse (Steuwe et al., 2012). Studies have also examined latent classes of PTSD symptoms in military veterans of multiple eras, including Vietnam veterans (Steenkamp et al., 2012; Wolf et al., 2012) and Iraq and Afghanistan veterans (Hebenstreit et al., 2014; Maguen et al., 2013).

The results of these studies typically indicate the presence of three (Ayer et al., 2011; Breslau et al., 2005; Steenkamp et al., 2012; Steuwe et al., 2012) or four (Au et al., 2013; Maguen et al., 2013) latent classes. Classes are generally distinguished by symptom severity, with classes representing minimal/mild, intermediate, and severe PTSD symptoms. PTSD classes have also been distinguished by specific symptom elevations. For example, several studies indicate the presence of a class of PTSD symptoms characterized by dissociation (Steenkamp et al., 2012; Steuwe et al., 2012; Wolf et al., 2012) as well as emotional numbing (EN) (Breslau et al., 2005; Hebenstreit et al., 2014; Maguen et al., 2013).

Although the latent structure of PTSD symptoms has been explored in multiple populations, further study is warranted among women exposed to IPV. To date, one study has applied LPA in a community sample of women who experienced mutual aggression (i.e. bidirectional violence) in intimate relationships, identifying three PTSD symptom profiles differentiated by Low, Moderate, and High symptom severity (Hellmuth et al., 2014). We wanted to better understand latent symptom profiles in women exposed to a recent incident of IPV, with particular emphasis on a diverse, non-treatment seeking sample that allowed us to assess heterogeneity of PTSD symptoms. Consequently, the primary aim of this study was to examine latent PTSD symptom profiles in a non-treatment seeking community sample of women following a police-reported incident of IPV. Women were recruited directly following the IPV incident, and the current study focused on PTSD symptoms in the immediate aftermath of that incident rather than examining PTSD diagnoses.

After establishing the latent profiles in this sample, we next considered variables that would help evaluate whether these sorts of distinctions have relevant clinical implications. To that end, we elected to look at IPV-related appraisals given long-standing evidence that post-traumatic cognitions and emotions are related to PTSD and other forms of trauma-related distress (e.g., Ehlers and Clark, 2000). For example, appraisals such as fear, alienation, and self-blame have been associated with trauma-related symptoms in a range of trauma-exposed populations as well as in women exposed to IPV (DePrince et al., 2011, 2010; Matlow and DePrince, submitted for publication; Startup et al., 2007; Wong

and Cook, 1992). We predicted that differences in women's types of appraisals (e.g., fear, shame, self-blame, alienation, anger, and betrayal) of the IPV event would be strongly associated with PTSD symptom presentation. We also adjusted for demographic differences (age, socioeconomic status, and racial/ethnic minority status) as well as trauma-related variables (time since the target IPV incident, target IPV incident severity, and prior history of interpersonal trauma).

## 2. Methods

### 2.1. Study population

As part of a larger study (DePrince et al., 2012a, 2012b), potential participants were identified through publicly-accessible police reports of domestic violence incidents that occurred within a single jurisdiction in a large urban city in the Rocky Mountain West of the United States. The original sample consisted of 236 women, seven of whom were excluded from the current analyses due to incomplete PTSD symptom data. The final sample consisted of 229 women ages 18–61, with an average age of 33.1 ( $SD=10.8$ ). One hundred and sixty women (72%) identified as belonging to one or more racial and/or ethnic minority groups. For demographic information, see Table 1. All study procedures were approved by a University-based Institutional Review Board.

### 2.2. Data source

Publicly-accessible incident reports were obtained for cases that involved perpetration of IPV by an adult male against an adult female partner. Given the infrequency of cases reported to law enforcement that involved cross arrests for bidirectional violence, monolingual non-English speakers, or same-sex couples, these

**Table 1**  
Sample characteristics.

Age	Range 18–61%	Mean (SD) 33.1 (10.8) N
<i>Years of education</i>		
1st–8th grades	3	8
Some high school	28	63
High school graduate	26	60
Some college	25	56
Associate's degree	8	18
4-year college degree	7	15
Postgraduate	2	6
Other (trade school, specialized training)	1	3
<i>Race and ethnicity</i>		
White/Caucasian	47	107
Black or African-American	30	69
Asian/Pacific Islander	2	5
American Indian or Alaskan native	11	25
Other	6	14
Hispanic or Latina origin	40	90
Any ethnic/racial minority	72	160
<i>Marital status</i>		
Married	9	21
Living with someone	9	19
Divorced	18	40
Separated	12	27
Widowed	3	6
Single and never married	42	93
Other	7	16

Note: Participants endorsed multiple racial and ethnic categories where applicable. Percentages do not total 100% due to rounding.

cases were excluded. Juvenile and sexual assault cases were not publicly accessible.

Women were recruited to complete the three-hour initial visit as quickly as possible following the target IPV incident, and were compensated \$50 for participation. The mean time elapsed between the target incident and recruitment into the study was 44 days. Geocoded spatial location data suggested that the study sample was representative of the spatial locations of IPV incidents within the jurisdiction during the recruitment period (see DePrince et al., 2012a, 2012b). For safety reasons, participants did not know in advance that the study would focus specifically on IPV, and therefore did not self-select into the research based on its trauma focus (for a more detailed discussion, see Hebenstreit and DePrince, 2012).

### 2.3. Measures

#### 2.3.1. Dependent variable

PTSD Latent Profiles were identified by latent profile analysis (described below) using the seventeen symptoms from the *Posttraumatic Diagnostic Scale* (PDS, Foa et al., 1997), a 28-item self-report instrument measuring severity of DSM-IV PTSD symptoms occurring in the past month. Each item is rated on a four-point scale, with higher scores indicating greater severity. The PDS has high diagnostic agreement with structured clinical interviews assessing PTSD (Foa et al., 1997), and has been used with samples of female domestic violence survivors (Griffin et al., 2004). Cronbach's alpha for the current sample was 0.93. As this measure was administered soon after the target incident, symptoms may not have been present for the one-month duration required for a PTSD diagnosis, and we assessed PTSD symptoms rather than diagnostic status.

#### 2.3.2. Independent variables

IPV-related appraisals were assessed using the *Trauma Appraisal Questionnaire* (TAQ; DePrince et al., 2010). The TAQ is a 54-item self-report measure of posttraumatic appraisals that asks respondents to indicate (on a scale of 1–5) agreement with a series of statements that describe cognitive reactions to a traumatic event. The TAQ consists of six subscales: Betrayal (e.g., “the people that I was supposed to trust the most hurt me”), Self-blame (e.g., “I am responsible for what happened”), Fear (e.g., “I feel terrified”), Anger (e.g., “I want revenge”), Alienation (e.g., “I am disconnected from people”), and Shame (e.g., “I feel humiliated”). The TAQ has demonstrated strong reliability and validity across multiple samples (DePrince et al., 2010). Cronbach's alpha for the subscales included in the current study ranged from 0.90 to 0.93. To account for demographic differences between profiles, we adjusted for racial/ethnic minority status, SES, and age. Race and ethnicity data were used to create a dichotomous minority status variable representing women who identified only as White and women who identified with any racial or ethnic minority group. A global socioeconomic status (SES) variable was created using education, occupation, and income data.

We also adjusted for several trauma-related factors. We calculated the number of days between the target incident and the first study visit in order to control for the amount of time that had passed between the target incident and the study assessment. Prior history of interpersonal trauma (not including the target IPV reported to police) was assessed using the *Trauma History Questionnaire* (THQ; Green, 1996), a 24-item assessment of lifetime occurrence of potentially traumatic events. The THQ has been used effectively in clinical and nonclinical samples, and has been shown to have high test–retest reliability (Green, 1996). To represent lifetime history of interpersonal trauma, we calculated a tally of the number of different perpetrators of crime-related events and unwanted physical and sexual experiences

(Matlow and DePrince, 2013). The severity of the target IPV incident was assessed using the *Revised Conflict Tactics Scale* (CTS; Straus et al., 1996). We tallied the total number of psychologically (possible range=0–15) and physically (possible range=0–13) aggressive tactics used by the abuser in the target incident, which was then summed to create a total target IPV incident severity score.

### 2.4. Analysis

Distinct classes of PTSD symptom profiles at initial clinical presentation were identified with latent profile analysis (LPA). This method assumes that the indicator variables are explained by unobserved constructs, and fits latent profile models to the data. After generating profiles, participants are classified as belonging to the profile for which the probability of membership is highest.

Each of the 17 PDS symptom-based items was included as continuous variable in a LPA. The LPA was conducted using the robust maximum likelihood estimator. We ran multiple solutions using increasing numbers from one to ten profiles in order to identify the optimal number of subgroups. We compared the goodness-of-fit indices (Bayesian Information Criterion (BIC), Akaike Information Criterion (AIC), statistically significant bootstrapped likelihood ratio test (BLRT) *p*-value, and entropy) across the ten models to identify the most parsimonious and best-fitting model.

Most-likely latent profile membership was determined for each participant and used as outcome variable in multinomial logistic regression analyses to examine the associations between the latent profile membership and IPV-related appraisals, while controlling for demographic differences (age, SES, and racial/ethnic minority status) as well as trauma-related variables (time [in days] since target incident, target incident severity, and prior history of interpersonal trauma). The LPA was conducted with the Mplus statistical modeling software (Version 7; Muthen and Muthen, 2012). Descriptive statistics and multinomial logistic regression analyses were carried out with SAS (Version 9.3; SAS Institute Inc., Cary, NC).

## 3. Results

The five-profile model had the lowest BIC, AIC, and statistically significant bootstrapped likelihood ratio test (BLRT) *p*-value, which indicated best model fit (Nylund et al., 2007). Next we compared entropy, which measures the clarity of profile distinction, across all models. Entropy values of  $\geq 0.80$  are considered strong, and values approaching one are indicative of good model fit (Celeux and Soromenho, 1996). Based on these criteria, we identified the five-profile model as the most parsimonious and best-fitting model (see Appendix).

In Fig. 1, the latent profiles are presented in terms of the within-profile mean for each PDS item. The first profile (Low Symptom profile; 46% of the sample) was characterized by a very low ( $< 0.9$ ) mean endorsement of all of the 17 PTSD symptoms. The second profile (Low Symptom with High Hypervigilance (HH) profile; 17%) was also characterized by fairly low ( $< 1.5$ ) mean symptom endorsement on most items, and by markedly higher mean scores on symptoms of hypervigilance (2.1) and exaggerated startle (1.8). The third (Intermediate Symptom with HH; 11%) and fourth profiles (Intermediate Symptom; 16%) profiles were both characterized by symptoms of re-experiencing (particularly physiological and psychological reactivity), as well as avoidance, and some symptoms of increased arousal. These two profiles differed markedly on symptoms of hypervigilance and exaggerated startle, with the Intermediate Symptom profile having relatively lower mean scores (1.1 and 0.97, respectively) on those two items; and the Intermediate Symptom with HH profile having much higher mean endorsement

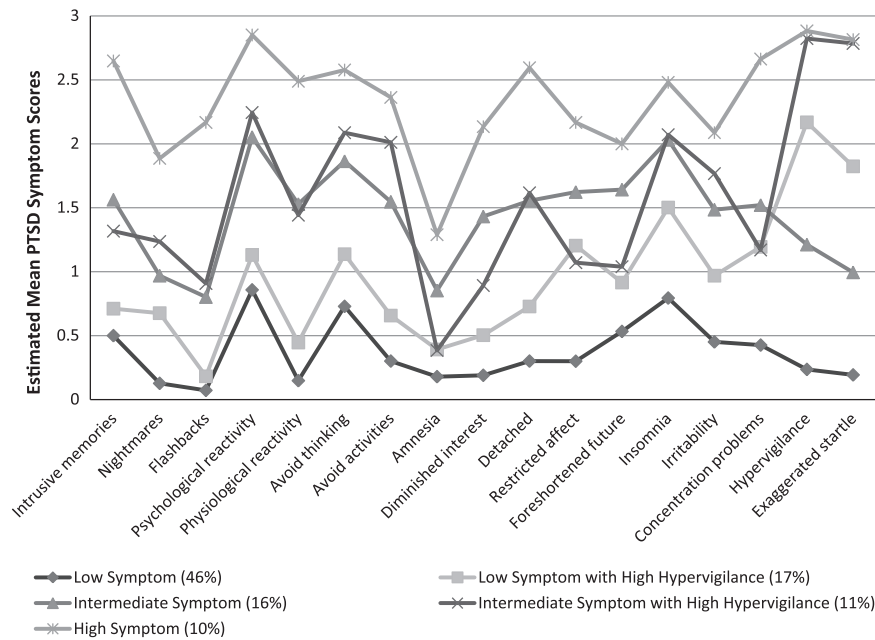


Fig. 1. Estimated mean PDS item scores by latent PTSD symptom profile among women exposed to IPV.

(2.8 and 2.7, respectively) of these symptoms. The fifth profile (High Symptom profile; 10%) was the most symptomatic profile with a very high mean ( $> 2.0$ ) endorsement on nearly all PTSD symptoms.

Multinomial logistic regression models examined the associations between latent profiles and appraisal variables (Table 2). The strongest independent predictors of PTSD latent profile membership were IPV-related appraisals. Fear appraisals were consistently associated with increased likelihood of belonging to more symptomatic profiles (Low with HH, Intermediate, Intermediate with HH, or High Symptom versus the Low Symptom profile; High Symptom and Intermediate with HH symptom profiles versus the Low with HH and Intermediate Symptom profiles). Alienation appraisals were associated with increased likelihood of belonging to the Intermediate, Intermediate with HH, or High Symptom versus the Low Symptom profiles, and to the High Symptom and Intermediate with HH symptom profiles versus the Low with HH and Intermediate Symptom profiles. Women with greater self-blame appraisals were more likely to belong to the Low with HH profile or the Intermediate Symptom profile as compared to both the Low Symptom profile and the Intermediate with HH profile, and were more likely to belong to the Intermediate Symptom profile versus the High Symptom profile (AOR=4.17, 95% CI=[1.37, 12.67],  $p < 0.05$ ).

Target IPV incident severity was also independently associated with PTSD latent profile membership. Women who reported greater incident severity were more likely to belong to the High Symptom profile as compared to the Low Symptom profile (AOR=1.28, 95% CI=[1.03, 1.59],  $p < 0.05$ ) or the Intermediate Symptom profile (AOR=0.79, 95% CI=[0.65, 0.97],  $p < 0.05$ ). Longer time (in days) since the target IPV incident was associated with a slightly increased likelihood of belonging to the Low Symptom with HH (AOR=1.01, 95% CI=[1.00, 1.02],  $p < 0.05$ ), Intermediate (AOR=1.01, 95% CI=[1.00, 1.03],  $p < 0.05$ ) or Intermediate with HH (AOR=1.02, 95% CI=[1.00, 1.04],  $p < 0.05$ ) profiles as compared to the Low Symptom profile. Latent profile membership was not associated with age, minority status, prior history of interpersonal violence, or SES.

#### 4. Discussion

Women's PTSD symptom presentation soon after IPV exposure was best described by a five-profile model. Profiles were characterized as

including Low, Intermediate, and High symptom profiles, with two additional profiles that were similar to the Low and Intermediate profiles, but distinguished by elevated hypervigilance symptoms. Our finding that PTSD was best represented by severity-based profiles is consistent with prior studies (Au et al., 2013; Ayer et al., 2011; Breslau et al., 2005; Hellmuth et al., 2014; Maguen et al., 2013; Steenkamp et al., 2012). However, unlike most prior studies, we found that a five-profile model best fit the data. In a non-treatment seeking sample of women, the large size of the Low Symptom profile (46%) was not surprising and provided an important opportunity to look more broadly at the variability in presentations of PTSD symptoms following the most common form of violence against women. The current study differed from many previous studies in that women were recruited directly following exposure to a traumatic event that was documented via police report. As discussed in detail elsewhere (Hebenstreit and DePrince, 2012), participants did not know in advance that the study would focus specifically on IPV, and therefore did not self-select into the research based on its trauma focus.

The strongest independent predictors of PTSD latent profile membership were IPV-related appraisals. Participants' reports of self-blame, alienation, and fear were associated with latent profile membership, even when controlling for demographic characteristics as well as other variables that have been associated with PTSD symptoms. This study expanded upon prior explorations of latent PTSD symptom profiles by linking profile membership to trauma-related appraisals. Our findings are consistent with prior evidence that negative appraisals are related to symptoms of posttraumatic stress among survivors of interpersonal as well as non-interpersonal traumas (e.g., Andrews et al., 2000; Cromer and Smyth, 2010; DePrince et al., 2011). Alienation was consistently associated with belonging to the more symptomatic profiles as compared to the less and moderately symptomatic profiles. This finding was concordant with previous studies indicating that alienation is associated with PTSD symptoms (DePrince et al., 2011; Fairbrother and Rachman, 2006; Jobson and O'Kearney, 2009). A separate study using the current sample found that lower alienation was associated with increased social support (DePrince et al., 2011). Social support can act as a protective factor against a range of physical and mental health consequences for women exposed to IPA, including PTSD symptoms (Scarpa et al., 2006; Schumm et al., 2006). Although we cannot infer causality from the present cross-sectional findings, it is possible that alienation may

**Table 2**  
Association between PTSD latent profile membership and trauma appraisals among women exposed to IPV.

Independent variable	Low w/HH vs. low (ref)		Intermediate vs. low (ref)		Intermediate w/HH vs. low (ref)		High vs. low (ref)		Intermediate w/HH vs. high (ref)	
	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI
Age	1.03	[0.98, 1.07]	1.01	[0.96, 1.07]	0.98	[0.92, 1.05]	1.03	[0.96, 1.11]	0.95	[0.88, 1.02]
SES	0.90	[0.49, 1.64]	1.13	[0.60, 2.15]	2.02	[0.71, 5.70]	2.03	[0.66, 6.20]	0.99	[0.30, 3.24]
<i>Race/ethnicity</i>										
Minority (ref)	1.00		1.00		1.00		1.00		1.00	
Not minority	1.16	[0.42, 3.21]	1.16	[0.42, 3.21]	1.91	[0.63, 5.72]	0.71	[0.11, 4.38]	4.15	[0.45, 37.74]
Trauma history	1.35	[0.97, 1.88]	1.08	[0.71, 1.66]	1.05	[0.62, 1.78]	1.45	[0.84, 2.50]	0.72	[0.44, 1.19]
Arrest incident severity	1.06	[0.94, 1.19]	1.02	[0.88, 1.18]	1.21	[0.99, 1.47]	1.28*	[1.03, 1.59]	0.94	[0.77, 1.14]
Time	1.01*	[1.00, 1.02]	1.01*	[1.00, 1.03]	1.02*	[1.00, 1.04]	1.01	[0.98, 1.04]	1.00	[0.97, 1.04]
Self-blame	2.66**	[1.22, 5.77]	3.68**	[1.59, 8.50]	0.63	[0.20, 1.99]	0.88	[0.25, 3.03]	0.72	[0.27, 1.86]
Fear	2.46**	[1.27, 4.76]	3.66**	[1.70, 7.85]	14.51***	[5.14, 40.91]	14.77***	[4.52, 48.48]	0.98	[0.36, 2.64]
Alienation	1.28	[0.66, 2.48]	2.38*	[1.09, 5.18]	8.44***	[2.93, 24.29]	20.58***	[4.87, 86.95]	0.41	[0.11, 1.45]
<i>Adjusted Odds Ratios (AOR) and 95% Confidence Intervals (CI)</i>										
	Low w/HH vs. high (ref)		Intermediate vs. high (ref)		Intermediate vs. low w/HH (ref)		Intermediate w/HH vs. low w/HH (ref)		Intermediate w/HH vs. intermediate (ref)	
Age	0.99	[0.92, 1.07]	0.98	[0.91, 1.05]	0.98	[0.94, 1.03]	0.95	[0.89, 1.01]	0.96	[0.90, 1.03]
SES	0.44	[0.14, 1.34]	0.56	[0.19, 1.61]	1.26	[0.65, 2.87]	2.23	[0.79, 6.31]	1.77	[0.64, 4.88]
<i>Race/ethnicity</i>										
Minority (ref)	1.00		1.00		1.00		1.00		1.00	
Not minority	1.63	[0.26, 10.00]	0.72	[0.13, 3.82]	0.44	[0.13, 1.48]	0.23	[0.02, 1.87]	0.13	[0.01, 1.02]
Trauma history	0.93	[0.56, 1.54]	0.74	[0.45, 1.24]	0.80	[0.54, 1.18]	0.78	[0.45, 1.27]	0.97	[0.59, 1.60]
Arrest incident severity	0.82	[0.67, 1.01]	0.79*	[0.65, 0.97]	0.96	[0.84, 1.10]	1.14	[0.94, 1.37]	1.18	[0.98, 1.42]
Time	0.99	[0.96, 1.03]	1.00	[0.97, 1.03]	1.00	[0.98, 1.02]	1.01	[0.99, 1.03]	1.00	[0.98, 1.02]
Self-blame	3.01	[0.96, 9.47]	4.17*	[1.37, 12.67]	1.38	[0.66, 2.87]	0.23**	[0.08, 0.68]	0.17**	[0.06, 0.48]
Fear	0.16***	[0.05, 0.50]	0.24*	[0.08, 0.71]	1.48	[0.76, 2.90]	5.89***	[2.23, 15.59]	3.96**	[1.53, 10.24]
Alienation	0.06***	[0.01, 0.26]	0.11**	[0.02, 0.46]	1.85	[0.84, 4.06]	6.57**	[2.27, 19.01]	3.54**	[1.24, 10.14]

Note: OR=odds ratio; AOR=adjusted odds ratio; and CI=confidence interval.

\*  $p < 0.05$ .

\*\*  $p < 0.01$ .

\*\*\*  $p < 0.001$ .

reduce the protective potential of available social support for some women, while the availability of social support may protect against the development of alienation in others. When working with female survivors of IPV, it may be useful for clinicians to assess for factors such as alienation that may make it more difficult for the patient to access her support network.

Women who reported more fear appraisals were more likely to belong to the more symptomatic profiles in nearly all comparisons. Similar to alienation appraisals, fear appraisals were consistently associated with belonging to the more symptomatic profiles as compared to the less symptomatic profiles and moderately symptomatic profiles. Given the ample body of research that has investigated the role of fear in PTSD (Amstadter et al., 2009; Mahan and Ressler, 2012; Milad et al., 2008) the association between greater fear appraisals and more symptomatic PTSD symptom profiles was not surprising. The current sample was recruited shortly following a documented incident of IPV, and the temporal proximity to the traumatic event may explain the strength of the relationship between fear appraisals and PTSD symptom profile. Many women in the current sample described themselves as being in current romantic and/or co-parenting relationships with the perpetrator at the time of the study visit, suggesting that the threat of further violence was ongoing. Further research may indicate that the timing of change-focused interventions (such as Motivational Interviewing) can be tailored to women's specific fear appraisals of abusive relationships.

We found that women who reported more self-blame were less likely to belong to both the least and most symptomatic profiles. Previous linear regression analyses of this sample did not find an association between self-blame and PTSD when examined linearly (DePrince et al., 2011). The current finding emerged only when a latent profile approach was applied, which illustrates the benefits of using person-oriented analyses as a complement to variable-oriented analyses. Findings from this study may also highlight the

complexity of self-blame appraisals in PTSD. For example, certain types of self-blame appraisals (e.g., behavioral vs. characterological; Janoff-Bulman, 1992) have been associated with increased posttraumatic distress in many studies, while others found that types of self-blame were unrelated to, or were potentially protective against, posttraumatic distress (Breitenbecher, 2006; Frazier 2003; Koss et al., 2002; Startup et al., 2007; Ullman et al., and 2007). Cognitive Processing Therapy (CPT; Resick et al., 2010) suggests that self-blame may be viewed as a patient's attempt to identify ways in which she could have prevented or changed the outcome or traumatic event that occurred. For women who face ongoing abuse from a partner, self-blame may represent an attempt to establish a sense of control and safety in an inherently unsafe environment. In the context of IPV, self-blame on the part of the survivor may preclude her from recognizing the perpetrator's full responsibility for his actions, which may in turn delay or impede the decision to exit the abusive relationship (Matlow and DePrince, submitted for publication). When targeting self-blame appraisals in existing interventions for PTSD, clinicians may seek to enhance women's sense of control and safety while holding the perpetrator responsible for his behavior.

Greater IPV severity and frequency has been associated with PTSD severity (Krause et al., 2008; Vogel and Marshall, 2001), and among women with recent IPV exposure, prior history of IPV is associated with high PTSD symptoms (Coker et al., 2005). Target IPV incident severity was independently associated with more symptomatic PTSD latent profile membership in several comparisons between profiles, which is consistent with previous findings.

#### 4.1. Limitations

There are several limitations to consider in the present study. First, the study was designed specifically for female participants

whose abuse by male partners had recently come to the attention of law enforcement; therefore, the study's findings may not generalize to IPV in other gender configurations (e.g. same-sex couples, male victims, etc.). Second, while the interviews were held soon after the *target* IPV incident (i.e., the particular incident for which a police report was made during the study recruitment period), this incident was the first/only experience of IPV for some women and only the most recent incident of violence for other women. Future work will need to consider the role that patterns of victimization (e.g., initial victimization, revictimization in the context of chronic violence in a single relationship, revictimization in the context of a new relationship) have on PTSD symptom expression. Finally, the LPA is cross-sectional and does not permit conclusions about the stability of these profiles over time.

## 5. Conclusions

The current study identifies several important factors related to the clinical presentation of PTSD symptoms in non-treatment seeking women exposed to IPV. Trauma-related appraisals including self-blame, alienation and fear emerged as strong predictors of profile membership. Alienation and fear appraisals were consistently associated with increased likelihood of belonging to more symptomatic profiles. Increased self-blame appraisals were associated with an increased likelihood of belonging to more symptomatic profiles, but a decreased likelihood of belonging to the most symptomatic profile. Greater target IPV incident severity was also associated with an increased likelihood of belonging to the more severe symptom profiles as compared to the less severe symptom profiles. These findings suggest that women's cognitive appraisals of IPV are closely linked with PTSD symptom presentation, above and beyond other factors that have been associated with symptoms of PTSD. When working with women exposed to IPV, clinicians may wish to address specific negative appraisals and symptoms. For future research, longitudinal analysis can provide additional information about other forms of trauma-related distress (e.g., depression, dissociation, substance abuse) that may be associated with PTSD symptom profile membership. Future study can also build upon these findings by exploring associations between latent profiles and clinical outcomes.

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## Conflict of interest

The authors have no conflicts of interests to report.

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## Appendix A. Supporting information

Supplementary data associated with this article can be found in the online version at <http://dx.doi.org/10.1016/j.jad.2015.03.047>.

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