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# PTSD, Depression, and Substance Abuse Symptoms in Women Exposed to Intimate Partner Abuse

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PTSD, DEPRESSION, AND SUBSTANCE ABUSE SYMPTOMS IN WOMEN  
EXPOSED TO INTIMATE PARTNER ABUSE

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A Dissertation

Presented to

the Faculty of Arts and Humanities

University of Denver

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In Partial Fulfillment

of the Requirements for the Degree

Doctor of Philosophy

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by

Claire L. Hebenstreit

November 2013

Advisor: Dr. Anne P. DePrince

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### **Abstract**

The present study explores relationships among several established correlates of trauma in women exposed to intimate partner abuse (IPA), including PTSD, depression, and dissociation symptoms as well as alcohol use as well as other trauma-related variables, such as social support and violence exposure. Two analysis methods were utilized: variable-oriented methods, which examine relationships between variables, and person-oriented analysis methods, which examine groupings of participants within a larger sample ( $N = 233$ ). Results of the variable-oriented analyses indicated positive links among depression, PTSD, dissociation, and alcohol use in women exposed to IPA, as well as positive links between the aforementioned psychological symptoms and exposure to violence. Social support was related to decreased psychological symptoms. Person-oriented analyses indicated the presence of four unique profiles of women within the larger study sample: Profile 1 ( $n = 21$ ), which was labeled *High Dissociation, Low Depression/PTSD*; Profile 2 ( $n = 150$ ), which was labeled *Low Symptoms, High Social Support*; Profile 3 ( $n = 41$ ); which was labeled *Low Dissociation, High Depression/PTSD*; and Profile 4 ( $n = 22$ ), which was labeled *High Symptoms, Low Social Support*. This research supports previous findings about the relationships among several variables related to IPA as well as suggests the need for careful consideration of differences among women within the larger context of research, advocacy, and clinical interventions related to IPA.

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## **Chapter One: Introduction**

### **Overview**

Intimate partner abuse (IPA) comprises physical, sexual, or psychological harm by a past or current intimate partner or spouse. In 2007, intimate partners perpetrated 23% of violent crimes against females, while intimate partners perpetrated 3% of violent crimes against males (National Center for Victims of Crime, 2011). In fact, IPA is the most common type of violence against women, as nearly two-thirds of women who reported sexual or physical assault in adulthood were victimized by an intimate partner. In the United States, IPA 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 her lifetime (Black et al., 2011; Tjaden & Thoennes, 2000). Given the costs and complexity of IPA, communities, policy makers, and researchers have increasingly called for the development of responses to IPA that leverage limited resources efficiently; for example, recent research has highlighted the importance of a flexible and victim-centered approach to victim advocacy and support, rather than a “one size fits all” response that may not meet the specific needs of each woman (DePrince, Belknap, Labus, Buckingham, & Gover, 2012; Goodman & Epstein, 2005).

A common question that emerges in practice is how to target resources based on women’s psychological symptoms following IPA, including the timing of interventions.

As reviewed below, the available literature on responses to IPA has focused on four related forms of psychological symptoms, generally in cross-sectional research using variable-oriented methods. These studies provide important information about the positive inter-relations among variables, but do not address heterogeneity in women's experiences of, and responses to, IPA (Bogat, Levendosky, & von Eye, 2005; Nurius & Macy, 2008). For example, Bogat, Levendosky, & von Eye (2005) note that variable-oriented statistics provide useful information about the prevalence and severity of IPA-related symptoms in a general population (e.g., women in the United States), and can provide a differential understanding of inter-individual characteristics between specific populations (e.g., differences in IPA-related symptoms prevalence and severity for women in rural vs. urban areas, different racial and ethnic identities, SES, etc.). However, the authors note that the variable-oriented approach can oversimplify conclusions by implying that IPA-related symptoms are distributed equally among a given population (e.g., IPA-related symptom prevalence among Hispanic women in rural areas), and advocate the use of multiple methodologies. Relative to variable-oriented approaches, the use of person-oriented approaches provides an opportunity to describe women experiencing IPA by structuring the population into smaller groups of women who share inter- and intra-individual similarities related to specific characteristics. A person-oriented approach can be used to consider the roles of multiple factors (e.g., urban or rural setting, race and ethnicity, income) that may describe women's symptoms within the larger population (von Eye, Noack, & Bogat, 2005). These approaches serve to identify similar groups of women within a heterogeneous sample, highlighting the complexity of women's experiences of IPA. Person-oriented approaches also highlight

the need for outreach and advocacy efforts that are targeted to the specific needs and circumstances of these groups, and may provide an empirical basis for practitioners to design, prioritize, and implement outreach and intervention efforts.

### **Trauma Correlates for Women Exposed to IPA**

The present study uses variable-oriented analyses to confirm relationships among trauma-related variables in IPA-exposed women, and also uses complementary person-oriented analyses as a complementary approach to understanding intra-individual patterns in trauma-related correlates among smaller subgroups. Research has established that women exposed to IPA are also at risk for a wide range of physical and mental health consequences (Campbell, 2002; Edwards, Holden, Felitti, & Anda, 2003; Finkelhor, Ormrod, & Turner, 2007; Green, McLaughlin, Berglund, Gruber, Sampson, & Zaslavsky et al., 2010; McDonnell, Gielen, O'Campo, & Burke, 2005). The research questions posed in the current study will address several key correlates of trauma within a sample of IPA-exposed women. These correlates will include PTSD, depression, and substance use disorders, all of which are associated with exposure to IPA (Golding, 1999; Goodman, Koss, & Russo, 1993). Additionally, the current study will include dissociation and social support as trauma-related variables. The current study will examine patterns of symptom endorsement among these variables in addition to assessing the stability of these patterns over time and as a function of alcohol use.

#### **PTSD.**

Among exposed women, rates of PTSD in clinical and nonclinical samples have been estimated to range between 22 and 64% (Chemtob & Carlson, 2004; Cohen, Field, Campbell, & Hien, 2013; Dutton, 2009; Nixon, Resick, & Nishith, 2004; O'Campo et al.,

2006; Stein and Kennedy, 2001). PTSD is one of the most prevalent disorders in women exposed to IPA (Campbell, 2002; Golding, 1999), and women exposed to IPA show significantly higher rates of PTSD than women in the general population (Anderson, 2002; Coker et al., 2002). Greater IPA severity and frequency has been associated with PTSD severity (Mertin & Mohr, 2000; Pico-Alfonso et al., 2006; Vogel & Marshall, 2001), and among women with recent IPA exposure, prior history of IPA is associated with high PTSD scores (Coker, Weston, Creson, Justice, & Blakeney, 2005). Among individuals exposed to potentially traumatic events, the majority will report a significant decline in PTSD during the initial months following trauma exposure. This general decline has been observed in a range of traumatic events (Bonanno & Mancini, 2012; Breslau, 2001), including exposure to interpersonal violence such as sexual assault (Foa & Riggs, 1995; Rothbaum, Foa, Riggs, Murdock, & Walsh, 1992; Steenkamp, Dickstein, Salters, Pedneault, Hofmann, & Litz, 2012). The current study aims to shed light on the course of PTSD symptoms over the course of one year, with the goal of identifying trends in symptom levels beyond the initial few months following exposure.

### **Depression.**

An expanding body of epidemiological and clinical research has established that individuals exposed to potentially traumatic events have substantially higher lifetime rates of depression than do individuals who have not been exposed (Blanchard, Buckley, Hickling, & Taylor, 1998; Brown et al., 1999; Fergusson, Horwood, & Lynskey, 1996; Harper & Arias, 2004; Kaplow & Widom, 2007; Kendler et al., 2002; Putnam, 2003; Shalev, Freedman, Peri, Brandes, Sahar, Orr, & Pitman, 1998; & Sternberg et al., 1993). Rates of depressive symptomatology are consistently estimated to be three to four times

higher among women exposed to IPA than women not exposed to IPA (Golding, 1999; Hathaway, Mucci, Silverman, Brooks, Mathews, & Pavlos, 2000). The current study will explore the trajectory of depression symptoms over the course of a year following exposure to IPA.

### **Substance use disorders (SUD).**

Trauma exposure (including but not limited to IPA) and SUD are highly comorbid. Among individuals with SUD, lifetime history of exposure to trauma and violence is common, and among individuals with PTSD, the odds ratio for SUD in women is 2.5 to 4.5. Studies estimate that 20 to 60% of women in inpatient treatment for SUD may also meet criteria for PTSD (Kessler, 2000; Triffleman, Marmar, Delucchi, & Ronfeldt, 1995), and that 50 to 90% of treatment-seeking females have been exposed to interpersonal violence (Hanson, Watkins, Burnam, Kung, & Paddock, 2001; Hesselbrock, Tworkowski, & Swan, 2002; Lipschitz, Kaplan, Sorkenn, Faedda, Chorney, & Asnis, 1996; Perkonig, Kessler, Shorz, & Wittchen, 2000). Women exposed to IPA are 70% more likely to drink heavily than women who have not been exposed to IPA (Stuart et al., 2006), and significant associations have been established between IPA exposure and SUD in community samples as well as in treatment settings (Centers for Disease Control and Prevention, 2008; Mckinney et al., 2010). The relationship between the two appears to be reciprocal, given numerous findings that the IPA exposure is a risk factor for increased substance use, and increased substance use is a risk factor for IPA (Kilpatrick, Acierno, Resnick, Saunders, & Best, 1997; Testa, Livingston, & Leonard, 2003). Recent research has suggested that alcohol use may serve as a coping mechanism (e.g. the “self-medication” hypothesis: see Khantzian, 1997), based on outcomes showing that women

who were at risk for heavy substance use also reported more positive alcohol expectancies (Kaysen, Dillworth, Simpson, Waldrop, Larimer, & Resick, 2007; Peters, Khondkaryan, & Sullivan, 2012).

### **Dissociation.**

Dissociation has been conceptualized in the literature as a psychological response to traumatic stress (Putnam, 1985; van der Kolk, Brown, & van der Hart, 1989; Lynn & Rhue, 1994), and the Diagnostic and Statistical Manual for Mental Disorders–Fourth Edition (DSM–IV) diagnostic criteria for posttraumatic stress disorder (PTSD) includes two dissociative symptoms (lack of recall of an important aspect of the trauma and behavioral or emotional re-experiencing). Dissociation represents a range of experiences, including mild everyday lapses in awareness and experiential disconnectedness as well as more impairing symptoms, such as loss of experiential continuity and an inability to access information (Cardeña & Carlson, 2011; Ginzburg, Butler, Saltzman, & Koopman, 2009). In the context of trauma exposure, common dissociative experiences may include gaps in awareness or memory, including an inability to recall certain aspects of the traumatic event as well as “losing track” of brief or sustained periods of time on an ongoing basis. Trauma survivors may also report derealization, in which individuals perceive that their environment is unreal or that they are watching themselves as if in a film, as well as depersonalization or disconnectedness from one’s body (Carlson, Dalenberg, & McDade-Montez, 2012). Over the past several decades, the empirical literature has provided evidence that dissociation is related to trauma exposure and severity, that dissociation symptoms rise sharply for most individuals following trauma

exposure but remain high for some individuals, and that high dissociation is related to increased PTSD symptoms (Iverson, Litwack, Pineles, Suvak, Vaughn, & Resick, 2013).

Women who have experienced IPA in multiple relationships are more likely to report more severe dissociative symptoms than women who experience IPA in a single relationship (Alexander, 2009). Dissociation has also been conceptualized as a mechanism by which women exposed to IPA are able to emotionally detach themselves from the reality of being victimized by a partner (Braun, 1988). In order to avoid triggers related to the abuse and to reduce negative emotional experiences, disengagement may emerge as a useful coping strategy; over time, however, avoidance and disengagement may contribute to detachment and social withdrawal, which in turn contributes to increased risk for dissociative and PTSD symptoms (Fortier et al., 2009).

#### **Overlap in PTSD, depression, SUD, and dissociation.**

Epidemiological and clinical studies have established a clear comorbidity of affective illness with SUD. The prevalence of depressive disorders in individuals seeking treatment for alcoholism may range from 15 to 67% (Nunes, 2003). Assessing and treating dually diagnosed clients may be especially challenging, given that the respective courses of depressive and SUD symptoms are frequently influenced by one another (Ostacher, 2007). Studies suggest that these patterns of association between depression and SUD are inconsistent and unlikely to be attributable to simple shared etiology. Although the association of substance abuse with depression has yet to be fully understood, multiple mechanisms are believed to contribute simultaneously to this comorbidity; previous research lends limited support for genetic and etiologic factors that

are shared between the two, while a larger body of research indicates that the disorders are risk factors for each other (Swendsen, 2000).

Numerous studies have also demonstrated an association between PTSD symptoms and greater depressive symptoms following trauma exposure. In clinical settings, the prevalence of PTSD among depressed patients ranges varies from 17 to 64% (Campbell, 2002; DeRubeis et al., 2005; Golding, 1999; O'Campo, 2006). Although the relationship between depression and PTSD symptoms is not yet fully understood, the presence of either disorder appears to increase the risk of developing the other (Breslau, David, Peterson, & Schultz, 1997; Koenen et al., 2002). Among women exposed to IPA, PTSD has been associated with more severe depressive symptoms, and may also impact the effectiveness of therapy for depression (Green et al 2002).

Associations among trauma and PTSD, SUD, and dissociation have been explored in recent literature. While PTSD and SUD have been established as risk factors for one another (Najavits, Weiss, & Shaw, 1997), studies also suggest that dissociation may play a role in both disorders. For example, Roesler & Dafler (1993) proposed that substance use could act as “chemical dissociation” from PTSD symptoms by providing a means by which to avoid trauma-related thoughts and emotions. The authors suggested that individuals with SUD should be less likely to report non-chemical dissociation, which has been supported by at least one study (Somer, Altus, & Ginzburg, 2010). However, other studies have produced alternative findings, including high non-chemical dissociation in SUD patients (Karadag, Sar, Tamar-Gurol, Evren, Karazog, & Ekiran, 2005; Tamar-Gurol, Sar, Karadag, Evren, & Karazog, 2008). In a study of dissociation among women with comorbid PTSD and SUD, Najavits & Walsh (2013) found that



women who reported high levels of dissociation were more severely impaired than women who reported low levels of dissociation, and that high dissociators were also more likely to endorse statements reflecting the belief that substances can help to manage psychological symptoms and problems.

### **Social Support.**

Evidence suggests that 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, depression, and suicide attempts (Coker, Smith, Thompson, McKeown, Bethea, & Davis, 2002; Coker, Watkins, Smith, & Brandt, 2003). Although the mechanisms are as yet unclear, researchers have proposed that social support may protect against a number of symptom dimensions by increasing coping skills, general well being, and social and tangible resources. Lower social support can predict higher PTSD symptoms following exposure to community violence (Scarpa, Haden, & Hurley, 2006), while increased social support has been suggested as a protective factor against PTSD in women exposed to multiple interpersonal traumas (Schumm, Briggs-Phillips, & Hobfoll, 2006). Social support has also been associated with legal help-seeking behaviors among women exposed to IPA (Wright & Johnson, 2009), and has been suggested as a protective factor against further violence exposure for women in abusive relationships (Fleet & Hiebert-Murphy, 2013). In fact, advocates have called for the integration of professional supports and survivors' own informal social support networks in order to improve domestic violence services, arguing that engagement with existing supporters and the use of network-oriented practices may improve victim safety and well-being (Goodman & Smyth, 2011).

Other studies have shown that IPA-exposed women who reported low levels of social support were also more likely to report depression than IPA-exposed women reporting high levels of social support (Mburia-Mwalili, Clements-Nolle, Lee, Shadley, & Yang, 2010), and that social support can mitigate depression among women exposed to IPA (Dasgupta, Battala, Saggurti, Nair, Naik, & Silverman et al, 2013). The presences of some aspects of social support have been associated with decreases in depression over time among women seeking help related to IPA (Suvak, Taft, Goodman, & Dutton, 2013). The relationship between social support and substance abuse in women appears to be more complicated, with some research suggesting social support can be related to better short-term outcomes for SUD treatment (Mulia, Schmidt, Bond, Jacobs, & Korcha, 2008), and other research suggesting that extreme, chronic stressors among one's social supports can increase the risk of problematic alcohol use among women (Comfort, Sockloff, Loverro, & Kaltenbach, 2003). Some research has found that individuals who use social support as a coping strategy may be at greater risk for higher daily alcohol consumption (McCabe, Roesch, & Aldridge-Gerry, 2013), suggesting that the *type* of social support may have an impact on alcohol use; a study of women in treatment for alcohol use disorders found that increased social support for drinking was predictive of alcohol use following treatment, while social support for abstinence was related to decreased alcohol use following treatment (Hunter-Reel, McCrady, Hildebrandt, & Epstein, 2010).

### **Variable- and Person-Oriented Analyses: A Complementary Approach**

To date, the preponderance of research on IPA has utilized variable-oriented methods to examine the factors associated with IPA exposure, as well as the impact of

IPA exposure on psychosocial outcomes (Nurius & Macy, 2010). Variable-oriented methods explore linear relationships between dependent and independent variable(s). Such methods presume that relationships between variables characterize the entire sample, which is assumed to be relatively homogenous. The studies described above have contributed valuable information to our understanding of the relationships among variables related to trauma and IPA exposure, and the first aim of the present study was to confirm these relationships among variables in the current sample. However, analysis of symptoms at the population level (e.g. women exposed to IPA) may fail to fully capture important differences between individuals (Nurius & Macy, 2008). To address this potential gap in the literature, the current study utilized person-oriented methods, which are rooted in the assumption that a given sample is comprised of heterogeneous people; therefore, these methods examine groupings of participants within a larger sample who share similar patterns of symptom endorsement (Muthén, 2001). The second aim of the present study was to expand upon traditional analyses by examining individual-level variance in variables related to IPA. To do so, we used Latent Profile Analysis (LPA); a person-oriented statistical technique that identifies shared characteristics across multiple individuals by examining patterns across variables in a manner that is similar to a factor analysis. Variable- and person-oriented methods represent two different, but complementary, approaches to understanding the characteristics of a given sample (Bergman & Trost, 2006).

## **Chapter Two: Study Aims**

Given the body of prior research suggesting associations among PTSD symptoms, depression, dissociation, and substance abuse among women exposed to IPA, the current study examines these characteristics as they relate to one another over the course of several study visits. The current study also assesses characteristics of IPA, such as physical, psychological, and injury severity, as well as other characteristics that may relate to IPA exposure, including trauma history and social support. The longitudinal design of the study provides a unique opportunity to explore this relationship in detail over the course of several time points. In addition to using variable-oriented analyses, the presented study uses person-oriented analyses as a complementary approach to understanding symptoms and correlates of IPA exposure in women.

### **Chapter Three: Research Questions and Hypotheses**

The present study addresses the following research questions:

#### **Question 1. Understanding IPA-Related Correlates from a Variable-Oriented Approach**

**1a: How are symptom dimensions and related characteristics associated among women exposed to IPA?** The first step in the current study was to replicate relationships among trauma-related symptoms and characteristics in a diverse community sample. We examine relationships among several common comorbidities associated with violence exposure, including PTSD symptoms, depressive symptoms, dissociative symptoms, and alcohol use. We also examine associations among these symptom measures and other IPA-related characteristics, including prior IPA exposure and social support. To address our first research question and set of hypotheses, we began by performing basic correlations among key study variables at all 4 study visits, including PTSD symptoms, depression, dissociation, weekly alcohol use, social support, arrest incident severity, and lifetime number of perpetrators.

Based on previously documented relationships among these variables, we predict that these symptom dimensions will be positively correlated, and that these symptoms will be positively correlated with characteristics related to IPA and trauma exposure, including arrest incident severity, prior exposure to IPA, and prior interpersonal victimization. Finally, we predict that social support will be associated with decreased

symptom levels. Stated more broadly, we predict that our variable-oriented analyses will produce findings similar to what has been demonstrated in a large body of prior research. While these traditional analyses are not in and of themselves novel, replicating results from the larger literature is an important step in preparing to then examine person-oriented analyses.

**1b. How do symptom dimensions and related characteristics change over time among women exposed to IPA?** In addition to examining cross-sectional relationships among symptom measures and related characteristics, we assessed specific symptom trajectories over the course of the first three visits of the present study. We ran a series of linear mixed-effects repeated measures models to assess PTSD symptoms, depressive symptom, dissociation, alcohol use, and social support trajectories over time. We ran additional linear mixed-effects repeated measures models to determine a main effect of at-risk drinking on PTSD symptoms and depression symptoms over time.

We predicted that PTSD symptoms, depression, and dissociation symptom severity would decrease over time. Additionally, given their established comorbid relationships, we predicted that higher levels of alcohol use at T1 would have a negative impact on PTSD symptom and depression symptom decline over time, as measured at visits T1-T3. As stated in Question 1a, we predicted that the results of our longitudinal variable-oriented analyses would be consistent with what would be expected based on previous research. Having established consistent relationships among variables using traditional analyses in Questions 1a and 1b, we expected to further develop these results in ways that are clinically and practically applicable by using person-oriented methods in Questions 2a and 2b.

**Question 2. Understanding IPA-Related Correlates from a Person-Oriented Approach.**

**2a. Are there distinct latent subgroups among women exposed to IPA?** The current study uses a person-oriented approach to determine whether unique subgroups of women based on PTSD, depression, and alcohol use symptom profiles are present within the larger sample in the immediate aftermath of IPA. A latent profile analysis (LPA) was performed in order to identify latent profiles within the sample using T1 data only. LPA does not include the specification of an a priori hypothesis or predictions regarding profile structure, but input variables are included in the model based on theory and empirical support. For our model, we chose to include PTSD symptoms, depressive symptoms, dissociation, alcohol use, social support, arrest incident severity, and prior exposure to interpersonal violence, and we predicted that the LPA would identify distinct patterns of variable responses within our larger sample.

**2b. Do symptom trajectories differ among latent subgroups?** In addition to assessing heterogeneity between subsets of IPA-exposed women in the context of depressive symptoms, the longitudinal design of the current study provided the opportunity to assess for heterogeneity within the sample as a factor of multiple dimensions (IPA exposure, trauma history, depressive symptoms, SUD, and PTSD symptoms) over the course of time. Having identified latent profiles within the sample at T1, we then compared the trajectories of depression, alcohol use, PTSD symptoms, and dissociation as a factor of T1 profile following exposure to IPA. After analyzing the trajectories of PTSD symptoms, depressive symptoms, dissociation, alcohol use, and social support trajectories over time over for research question 1b, we added levels to our

existing linear mixed-effects models that assessed the main effect of profile status on average symptom scores over the first three visits, as well as possible interactions between time and profile status. Although the nature of LPA did not allow us to make specific predictions about the nature and structure of latent subgroups, we predicted that the latent profiles (if they were identified) at T1 would show meaningful differences in outcome variable trajectories.



## **Chapter Four: Method**

### **Participants**

Two hundred and thirty-six adult female participants were recruited between December of 2007 and July of 2008 for an initial assessment (Time 1). Potential participants were identified through public records made available by the city police department. Arrest reports were obtained for all cases that involved perpetration of domestic violence by a male against a female partner. Cases that involved cross arrests for bidirectional violence, male victims of violence, juveniles, or same sex couples were excluded from the study. The median time elapsed between the arrest incident and recruitment into the study was 26 days. In spite of challenges to retaining women exposed to IPA in longitudinal studies (see DePrince, Belknap, Labus, Buckingham, & Gover, 2012), 81% (N = 192) of the initial 236 women returned for a 6 month follow up visit (Time 2), and 80% (N = 189) returned for a 1 year follow up assessment (Time 3). Women who did not complete the second assessment were still contacted to complete the third assessment. The number of women who completed at least one assessment visit (T2 or T3) represented 87% (N = 206) of the original study sample.

At the third study visit, women were given the option to provide consent to be contacted for future studies. Of the 189 women who completed T3, 176 gave consent for future contact. Of these 176 participants, 57 women (32%) returned for a fourth study visit (T4). This subsample represents a relatively small proportion of the original study

sample, which may be accounted for by the fact that participant contact information became outdated over time, the decrease in financial compensation that was offered for T4, and the lack of available funding for taxis to address transportation challenges. Final T3 visits were concluded in October of 2009, while T4 visits were conducted between March 2011 and March 2012, with an average span of 25 months between T3 and T4. Mean age for women who completed T4 was 36 years (range = 19-61;  $SD = 11.63$ ) ranged in age from 19 to 61 ( $M = 36$ ;  $SD = 11.63$ ), and participants endorsed the following racial/ethnic groups: 46% Hispanic, 42% Caucasian, 26% African-American, 16% Native-American/Alaska Native, 0% Asian-American, 0% Native Hawaiian or other Pacific Islander, and 7% Other. The fourth study visit was conducted as part of a smaller study, and retained many (but not all) of the variables of interest from T1-T3. Due to the relative difference in sample size between T4 and the other three study visits, it was not possible to include T4 data in longitudinal analyses without substantially decreasing statistical power. As a result, the variables from T4 that were analyzed for the current study, which included PTSD symptoms, depression symptoms, dissociation, and CTS physical and psychological aggression severity, were used only in cross-sectional analyses.

At Time 1, women's ages ranged from 18-63, with an average age of 33.4 ( $SD = 11.0$ ). Women reported their racial/ethnic backgrounds to be 47% White/Caucasian, 30% Black or African-American, 2% Asian/Asian American, 1% Pacific Islander, 11% American Indian or Alaskan Native, and 6% other, and 39% Hispanic or Latina. Across categories, 174 women (74%) identified as belonging to one or more racial and/or ethnic minority groups. Almost half the sample reported having ever been married (49%).

Women described their current relationship status to be: 9% married, 8% living with someone, 18% divorced, 12% separated, 2% widowed, 40% single and never married, and 7% other. Women reported the following in terms of highest level of education: 3% 1-8th grade; 27% some high school; 26% high school; 25% some college; 8% Associate's degrees; 7% 4-year college degree; 2% postgraduate education; and 1% other (e.g., trade school). Mean yearly income, which included sources such as salary, alimony and spousal support, disability and social security income, and public assistance, was approximately \$11,500.

### **Procedure**

Prior to Time 1, potential participants were contacted using address and phone information obtained from police reports. They were recruited first by a lead letter, which introduced the study and informed women that they could initiate contact on their own or wait to receive contact from study personnel by phone. At the time of initial phone contact with study staff, women were told that they had been identified through public records to participate in a study to improve health-related services for women. They were also told that they would be asked to answer questions regarding physical health and emotions as well as stressful life events, such as exposure to crime and violence. Due to safety concerns, women were not told that the study involved domestic violence until the informed consent process.

Participants were recruited to complete the initial visit as quickly as possible following the arrest incident. Interviews were conducted by female graduate students or the second author, all of whom underwent extensive training prior to data collection regarding ethical and clinical issues involved in conducting research on IPA, as well as

extensive training on the study protocol. In order to ensure that participants who consented did not feel compelled to continue participation in the event that they became distressed or uncomfortable, participants were told that they could skip any question that they did not want to answer, and that they could stop the study at any point without affecting their compensation. Although formal consent was obtained only at the first visit, to assess participants' understanding of consent information, including the voluntary nature of participation, we reviewed the consent form and then administered a verbal "consent quiz" before beginning all three interviews. Women were required to answer all consent quiz questions correctly within two tries in order to be considered as giving informed consent to participate in the study.

During the first, 3-hour assessment, an interview was conducted that included questions about participants' experiences, thoughts and feelings regarding the IPA incident reported to law enforcement as well as factors that were helpful and unhelpful in dealing with the incident. Women were asked about their physical and emotional health as well as their trauma histories, including IPA with current and past romantic partners. Participants were invited to return for follow up assessments 6 months (T2) and 1 year (T3) after the initial assessment; the content of these follow-up assessments closely paralleled the content of the first interview. Compensation for the first visit was \$50, and was increased to \$55 for the second visit and \$60 for the third. Participants were compensated \$25 for the fourth visit.

## **Measures**

Background demographic information was obtained at Time 1, 2, 3, and 4 using a *Demographics Questionnaire*, which included participant characteristics including

ethnicity, age, education, and occupation. Additional measures were administered at each time point.

At Time 1, past trauma history (not including the target IPA report to police) was assessed using the *Trauma History Questionnaire* (THQ; Green, 1996). This 24 item self-report measure assesses the occurrence of potentially traumatic events during both childhood and adulthood. Participants were asked to indicate lifetime occurrence using a yes/no format; for each event that is endorsed, frequency, age of onset, and relationship to perpetrator are assessed. Potentially traumatic experiences include events such as natural disasters, violent and nonviolent crime, serious illness, and loss of a romantic partner or child. The THQ has been used effectively in clinical as well as nonclinical samples, and has been shown to have high test-retest reliability over a two- to three-month period (Green, 1996). At Time 2 and Time 3, participants completed the THQ again, but were only asked to indicate occurrence of events in the time since the last interview. For the purpose of this study the following items were used to create a cumulative interpersonal trauma variable: items 1-4 tapping mugging, robbery, break-in, and items 18-23 tapping sexual and other types of physical assault by strangers, family or friends (number of times summed). Finally, a tally was created that reflected each participant's total lifetime number of perpetrators of interpersonal violence.

At all four visits, depression symptoms were assessed with the *Beck Depression Inventory – 2* (BDI-II; Beck, Steer, Ball, Ranieri, 1996). The BDI-II is among the most widely used self-report measures of depression with demonstrated validity and reliability. This 21-item measure assesses depression symptoms based on DSM-IV criteria. Items are summed to create a total depression score, with higher scores indicating increased

depression severity. Coefficient alpha was as follows for each time point: Time 1 = .89; Time 2 = .91; Time 3 = .91, Time 4 = .88.

PTSD symptoms were assessed at all four visits using the *Posttraumatic Diagnostic Scale* (PDS, Foa et al, 1997), a 28-item self-report instrument measuring severity of PTSD symptoms stemming from a single identified traumatic event. The PDS is keyed to DSM-IV criteria for PTSD and addresses symptoms occurring in the past month. It also assesses severity of PTSD symptoms, from 0 ("not at all or only one time") to 3 ("5 or more times a week / almost always"). The PDS has been shown to have 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, Resick, Ullmansiek, & Mechanic, 2004). A common use of this measure is to apply a cutoff score of 15 as being suggestive of clinically significant PTSD symptoms (Sheeran & Zimmerman, 2002). This measure was scored by summing symptom items (1-17) corresponding to total PTSD, for a possible range from 0-51. Chronbach's alpha for the current sample was: Time 1 = .82; Time 2 = .93; Time 3 = .93, Time 4 = .92.

Participants completed the *Interpersonal Support Evaluation List* (ISEL; Cohen & Hoberman, 1983; Cohen et al., 1985), which includes subscales for appraisal, belonging, and tangible support, at T1, T2, and T3. The ISEL assesses the perceived availability of four separate functions of social support that potentially have the ability to facilitate coping with stressful events. The "tangible" subscale measures the perceived availability of material aid. The "appraisal" subscale measures the perceived availability of someone to talk to about one's problems. The "self-esteem" subscale measures the perceived availability of a positive comparison when comparing one's self to others. Finally, the

“belonging” subscale measures the perceived availability of companions that one can enjoy activities with. Each function is measured through a 10-item cluster of questions. Average scores were computed across all items such that higher scores indicate greater levels of total social support. Coefficient alpha at each time was: Time 1 = .87; Time 2 = .87; Time 3 = .86.

Dissociative symptoms were assessed at all four visits using the *Dissociative Experiences Scale* (DES; Bernstein & Putnam, 1986), a widely used, 28 item self-report measure. The DES has been shown to have good validity and reliability and is scored by taking an average across items. Coefficient alpha for this measure at each time point were: Time 1 = .94; Time 2 = .95; Time 3 = .95, Time 4 = .94.

A *Substance Use Screener* was administered by the interviewer at the first three study visits. At the first three visits, participants were asked to indicate how often they had consumed alcoholic beverages in the past 6 months, as well as the average number of drinks consumed during a typical drinking episode. One drink was defined as 12 oz. of beer, 5 oz. of wine, or 1.5 oz. of liquor. The NIDA-Modified Alcohol, Smoking, and Substance Involvement Screening Test (NMASSIST) was used to create additional alcohol use variables: Presence/Absence of Unhealthy Drinking, for which unhealthy drinking was defined as any intake in excess of 3 drinks per day OR 7 drinks per week; and Presence/Absence of Binge/At-Risk Drinking, for which binge/at-risk drinking was defined as one more episodes of heavy drinking (more than 4 drinks) in the past year. A variable representing average weekly alcohol use was computed.

At Time 1, participants reported on different aspects of the IPA that led to the report to law enforcement. The severity of the target IPA incident was assessed using the

*Revised Conflict Tactics Scale* (CTS: Straus, Hamby, Boney-McCoy, & Sugarman, 1996), which was administered by interview. 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 CTS score. A separate tally was created to reflect the number of injuries sustained by the victim (possible range = 0-17). At Time 1, the CTS was also completed in relation to events that occurred in the 6 months that preceded the first study visit. At Time 2, Time 3, and Time 4, participants were asked to endorse CTS items that had occurred only in the past 6 months.



## **Chapter Five: Results**

### **Data Preparation**

Prior to analysis, data from all measures of interest were examined to assess for violations of statistical assumptions, including outliers, normality, skewness, and kurtosis, homogeneity of variance, and sphericity. For several variables (dissociation, number of perpetrators, and average alcohol consumption), extreme outliers were Winsorized to 2.5 standard deviations above the mean in order to bring skew and kurtosis within normal limits. Some of our analyses, including the mixed-effects models and the LPA, were designed to account for missing data, while other analyses excluded cases with incomplete data. Due to the difference in sample size between T4 and the other three study visits, it was not possible to include T4 data in longitudinal analyses without substantially decreasing statistical power. As a result, the variables from T4 that were analyzed for the current study, which included PTSD, depression, dissociation, and CTS physical and psychological aggression severity, were used only in cross-sectional analyses. For descriptive information, see Tables 1 and 2.

Table 1  
*Sample Characteristics*

	Years	
Age range	18-63	
Mean age (SD)	33.4 (11.0)	
	%	N
<b>Education</b>		
1 <sup>st</sup> -8 <sup>th</sup> grades	3	9
Some high school	27	63
High school graduate	26	61
Some college	25	59
Associate's Degree	8	18
4-year college degree	7	16
Postgraduate	2	5
Other (trade school, specialized training)	1	3
<b>Race and ethnicity</b>		
White/Caucasian	47	111
Black or African-American	30	71
Asian	2	5
Pacific Islander	1	3
American Indian or Alaskan native	11	26
Other	6	14
Hispanic or Latina origin	39	92
<b>Marital status</b>		
Have ever been married	49	116
Married	9	21
Living with someone	8	19
Divorced	18	43
Separated	12	29
Widowed	2	5
Single and Never Married	40	95
Other	7	16

Table 2  
*Arrest Incident Characteristics*

		Mean (SD)	Range	
Target IPA incident count and severity	Psychological aggression	4.53 (2.68)	0-14	
	Physical aggression	3.01 (2.65)	0-11	
	Injuries	2.68 (2.52)	0-10	
		N (%)		
		Not present	Minor	Severe
	Psychological aggression	19 (8.1)	26 (11.0)	185 (78.4)
	Physical aggression	59 (25.0)	38 (16.1)	133 (56.4)
	Injuries	72 (30.5)	24 (10.2)	134 (56.8)

**Question 1. Understanding IPA-Related Correlates From a Variable-Oriented Approach.**

**1a: How are symptom dimensions and related characteristics associated among women exposed to IPA?** Correlations were calculated for the main variables of interest (see Table 3). Results showed that average number of drinks per week was positively correlated with depression and dissociation at all time points, and with PTSD symptoms at T2 and T3. PTSD symptoms were positively correlated with increased depression, dissociation, and lifetime number of perpetrators at all four visits. Depressive symptoms were positively correlated with lifetime number of perpetrators at all four visits. Social support was measured at the first three visits, and increases in social support were consistently associated with decreased depression and dissociation. Correlations among data collected at the first three time points suggest that participants' at-risk

alcohol use was positively correlated with greater arrest incident severity. Finally, dissociation was positively correlated with lifetime number of perpetrators at the first three visits.

Table 3  
*Correlations Among Symptoms (T1-T3), and Incident Severity, and Perpetrators at T1*

	ISEL	Drinks/week	PTSD	BDI	DES	Incident severity
Time 1						
ISEL	--					
Drinks	-.07	--				
PTSD	-.36***	.07	--			
BDI	-.49***	.14*	.61***	--		
DES	-.28**	.25**	.50***	.55***	--	
Incident Severity	-.07	.09	.17*	.12	.15*	--
# of Perps	-.29	.12	.28**	.28**	.22**	-.00
Time 2						
ISEL	--					
Drinks	-.21*	--				
PTSD	-.46***	.32**	--			
BDI	-.53***	.33**	.67***	--		
DES	-.37***	.25**	.55***	.32**	--	
Incident Severity	-.04	.29**	.06	.11	.04	--
# of Perps	-.26**	.09	.21**	.28**	.25**	-.00

Time 3						
ISEL	--					
Drinks	-.23*	--				
PTSD	-.40***	.27**	--			
BDI	-.61***	.27**	.64***	--		
DES	-.36***	.29**	.53***	.53***	--	
Incident severity	-.01	.29**	.00	.06	.11	--
# of perps	-.18*	-.00	.25**	.19*	.19*	-.00
Time 4						
ISEL	--					
Drinks	+	--				
PTSD	+	+	--			
BDI	+	+	.71***	--		
DES	+	+	.53***	.61***	--	
Incident severity	+	+	.01	.11	-.01	--
# of perps	+	+	.37**	.14	.02	-.00

Note. + Variable not included in T4 analyses.

ISEL = Interpersonal Support Evaluation List. Drinks = number of drinks consumed per week. PTSD = Posttraumatic Diagnostic Scale. BDI = Beck Depression Inventory-II. DES = Dissociative Experiences Scale. Perps = lifetime number of perpetrators of interpersonal violence.

\* =  $p < .05$ ; \*\* =  $p < .01$ ; \*\*\*  $p < .001$

**1b. How do symptom dimensions and related characteristics change over time among women exposed to IPA?** We performed a series of longitudinal analyses to assess symptom dimensions and related characteristics over time. To assess sample-wide trajectories in symptoms (PTSD symptoms, depression symptoms, dissociation, and alcohol use) and social support, we ran a series of linear mixed-effects models for repeated measures examining the effect of time (T1, T2, and T3). The use of traditional GLM multivariate repeated-measures analysis of variance has several disadvantages; for example, normality and sphericity assumptions fail to account for correlated error

between repeated measures within subjects, and subjects with incomplete data are excluded from the analysis. In contrast, mixed-effects models incorporate both fixed and random effects into the analysis, provide greater flexibility, are able to account for within-subject measurement correlation, and are able to handle missing data (Gueorguieva & Krystal, 2004). These linear mixed-effects models were assessed using SPSS version 20. Each set of analyses specified a symptom measure as the outcome, and included time (T1, T2, and T3; T4 was excluded from the analyses due to comparatively small sample size) and outcome measure as fixed factors, while time was also specified as a random factor in order to account for correlation within individual participants. For each outcome measure, the model was run using a compound symmetry (CS) structure for the repeated covariance type, and then repeated two times substituting an autoregressive (AR:1) and an unstructured (UN) repeated covariance type. To assess for model adequacy, the Bayesian information criterion (BIC) for each of the three models was compared, and the model with the lowest BIC was selected. For 4 of the 6 outcome measure analyses, the CS covariance type provided the best model fit, while the AR:1 covariance model was selected for the PTSD symptoms and the alcohol consumption models.

These analyses assessing the main effect of time represented the first level of the mixed-effects models that are described in more detail in the results for research question 2b (see Table 4). These models indicated a significant effect of time on each of outcome variables, and suggested downward trajectories over time for PTSD symptoms, depression symptoms, and dissociation, while upward trajectories were indicated for social support and alcohol use over time. The full results of these analyses, which include

statistical values as well as additional levels reflecting latent profile group, are reported within that section.

Table 4  
*Linear Mixed-Effects Repeated Measures Models Predicting Symptoms by Profile*

	<i>N</i>	<i>df</i>	<i>F</i>	<i>p</i>	Group differences
Depression	231				
Time		2, 388.58	14.09	.000	T1 > T2, T3
Profile		3, 231.82	86.01	.000	P1 < P3 < P2, P4
Time x profile		6, 386.62	2.64	.01	--
PTSD	232				
Time		1.87, 392.86	17.39	.000	T1 > T2, T3
Profile		3, 234.65	52.91	.000	P1, P2 < P3 < P4
Time x profile		6, 390.68	1.46	.18	--
Dissociation	229				
Time		2, 382.38	5.67	.004	T1 > T2, T3
Profile		3, 240.15	133.90	.000	P2 < P3 < P1 < P4
Time x profile		6, 380.01	5.19	.000	--
Social support	230				
Time		2, 369.76	5.10	.007	T1 < T3
Profile		3, 226.77	32.40	.000	P3, P4 < P1, P2
Time x profile		6, 368.80	0.78	.58	--
Weekly drinks	230				
Time		2, 360.80	2.93	.05	T1 < T2
Profile		3, 237.44	11.52	.000	P1, P2, P3 < P4
Time x profile		6, 356.71	1.01	.41	--

To address our prediction that increased alcohol use would impact PTSD symptoms and depression symptom trajectories over time, we repeated the mixed-effects modeling procedure. We again specified a symptom measure (PTSD symptoms, depression symptoms) as the outcome, and included time and outcome measure as fixed

factors, while time was also specified as a random factor in order to account for repeated measures correlations. We added the “unhealthy drinking” variable as a second level of the analyses in order to assess for interactions between time and problematic alcohol use on symptom trajectories over time. The CS covariance type provided the best fit for both models. As expected, the first level of our analyses found a significant main effect of time on depression symptoms and PTSD symptoms, indicating downward trajectories over time for both variables (see Table 5). Results did not suggest a main effect of unhealthy drinking on average depression symptoms across the first three time points, nor did they reveal an interaction between time and unhealthy drinking status. However, we did find a main effect ( $F = 4.90, p = .02$ ) of unhealthy drinking on PTSD symptoms averaged over time. Specifically, we found that women in the unhealthy drinking group reported greater levels of PTSD symptoms averaged across time than did women who were not in the unhealthy drinking group. We did not find a significant interaction, indicating that PTSD symptom trajectories did not differ between the two groups.

Table 5  
*Linear Mixed-Effects Repeated Measures Models Predicting Depression and PTSD by Presence/Absence of Unhealthy Drinking*

	<i>N</i>	<i>Df</i>	<i>F</i>	<i>p</i>	Group differences
Depression	224				
Time		2, 357.40	16.69	.000	T1 > T2, T3
Unhealthy drinking		1, 221.95	0.80	.37	ns
Time x unhealthy drinking		2, 357.40	3.15	.04	ns
PTSD	225				
Time		2, 360.43	15.28	.000	T1 > T2, T3
Unhealthy drinking		1, 218.29	4.90	.02	Unhealthy drinking = increased PTSD
Time x unhealthy drinking		2, 360.43	1.18	.30	ns

*Note.* Unhealthy drinking was defined as any intake in excess of 3 drinks per day OR 7 drinks per week.



## **Question 2. Understanding IPA-Related Correlates From a Person-Oriented Approach.**

### **2a. Are there distinct latent subgroups among women exposed to IPA? A**

latent profile analysis (LPA) was conducted using MPlus Version 5.1 (Muthén & Muthén, 1998-2008) with Time 1 data from 233 women. Unlike many traditional analyses, LPA does not test a priori hypotheses, nor does it specify a particular model; instead, variables are included in the analyses based on prior research and theory. This method assumes that the indicator variables are explained by unobserved constructs, and fits latent profile models to the data. After generating profiles, probabilities for belonging to each profile are calculated for each participant, and participants are classified as belonging to the profile for which the profiles probability is highest. For our analyses, we predicted that LPA would identify unique profile subgroups based on symptom measures (PTSD, dissociation, depression, and alcohol consumption) and associated factors (social support, arrest incident severity, and lifetime number of perpetrators of interpersonal violence).

We ran multiple solutions using increasing numbers of profiles in order to identify the optimal number of subgroups within the T1 sample. To determine the most parsimonious and best-fitting model, profiles were compared based on three model fit statistics: Bayesian Information Criterion (BIC; Schwartz, 1978), Lo-Mendell-Rubin (L-M-R), and probability statistics (Everitt et al., 2001; Muthen, 2002). Of all the solutions, the four-profiles model had the lowest BIC value (9393), which indicated best model fit. In addition to the BIC, we also examined the L-M-R statistic in order to determine the strength of a given model (e.g., a 3-profiles model) against the model with one less

profile (e.g., a 2-profiles model). A significant  $p$ -value ( $p < .05$ ) indicates that the target model solution fits better (e.g., 3-profiles model is better than 2-profiles model). The L-M-R statistic for the four-profile model (83.86,  $p = .05$ ) was the only model that approached significance, suggesting that the four-profiles solution is superior to the three-profile, two-profile, and five-profile models. Finally, we examined the probability statistics for the four-profiles model, which assesses the probability that individual participants will be classified as belonging to a particular subgroup based on the specified model (see Table 6). These values were 0.97, 0.89, 0.90, and 0.97, respectively. These model fit indices (e.g., low BIC, LMR approaching significance level, high Entropy value, and high profile membership probabilities) in combination with our theoretical considerations of the variables, led us to conclude that the four-profile model was the most robust solution.

Table 6  
*Tests of Model Fit*

	2 Profiles	3 Profiles	<b>4 Profiles</b>	5 Profiles
Entropy	.87	.81	<b>.90</b>	.90
LMR	264; $p < .001$	84.79; $p = .45$	<b>83.86; <math>p = .05</math></b>	63.46; $p = .23$
BIC	9480	9437	<b>9393</b>	9371
Class member	0.96; 0.95	0.93; 0.92; 0.85	<b>0.97; 0.89; 0.90; 0.97</b>	0.92; 0.96; 0.86; 0.91; 0.99
Bootstrap p value	.000	.000	<b>.000</b>	.000

*Note.* Variables included in the analysis: Social support, Weekly drinks, PTSD, Depression, Dissociation, Incident severity, Lifetime # of perpetrators. BIC = Bayesian Information Criterion; lower BIC values indicate better model fit. LMR = Lo-Mendell-Rubin; values at or approaching significance indicate better model fit. These model fit indices, in combination with high Entropy and class membership probabilities, led to the selection of the four-profile model as the most robust solution.

### **Profile structures.**

Table 7 shows measure descriptives for the LPA subgroups, and includes the means and standard deviations for the variable indicators for each profile. Figures 1 and 2

present these data in standardized form. We labeled each profile according to its distinguishing features. Profile 1 ( $n = 21$ ), which we labeled as *High Dissociation, Low Depression/PTSD*, comprised women with lower symptom scores across most dimensions (PTSD, depression, alcohol use) but elevated dissociation, slightly elevated incident severity, and relatively fewer lifetime perpetrators. Profile 2 ( $n = 150$ ), which we labeled as *Low Symptoms, High Social Support*, included women with low symptoms across all domains (PTSD, depression, dissociation, alcohol use) higher reported social support, and lower incident severity as well as fewer lifetime perpetrators. Profile 3 ( $n = 41$ ), which we labeled as *Low Dissociation, High Depression/PTSD*, included women with elevated symptom scores in several domains (PTSD, depression) in conjunction with average symptom scores in other domains (alcohol use, dissociation), lower reported social support, slightly elevated incident severity, and higher numbers of lifetime perpetrators. Profile 4 ( $n = 22$ ), which we labeled as *High Symptoms, Low Social Support*, represented women with elevated symptoms across all domains (PTSD, depression, dissociation, alcohol use) as well as lower social support and increased incident severity as well as higher number of lifetime perpetrators. Demographic information (age, education, SES, minority status) did not differ across the four profiles.

Table 7  
*Profile Means and Standard Deviations on Symptom Measures and Related Variables*

	Total N = 233	Profile 1 n = 21	Profile 2 n = 150	Profile 3 n = 40	Profile 4 n = 22
Social support	32.29 (9.76)	32.61 (8.15)	35.64 (8.38)	23.21 (8.49)	24.85 (8.25)
Weekly drinks	4.31 (7.45)	4.90 (7.23)	3.29 (5.62)	4.00 (6.46)	11.20 (14.32)
PTSD	16.58 (12.11)	17.14 (11.77)	11.71 (8.91)	24.82 (9.54)	34.66 (11.21)
Depression	13.88 (9.58)	13.04 (7.38)	8.87 (5.59)	24.45 (6.22)	28.19 (7.44)
Dissociation	11.75 (10.89)	25.84 (5.05)	5.72 (3.65)	12.96 (4.52)	37.36 (3.91)
Incident severity	7.48 (4.43)	8.15 (4.19)	7.00 (4.15)	8.15 (5.20)	9.04 (4.74)
# of perpetrators	1.39 (1.59)	1.35 (1.30)	1.04 (1.36)	2.27 (1.88)	2.38 (1.87)

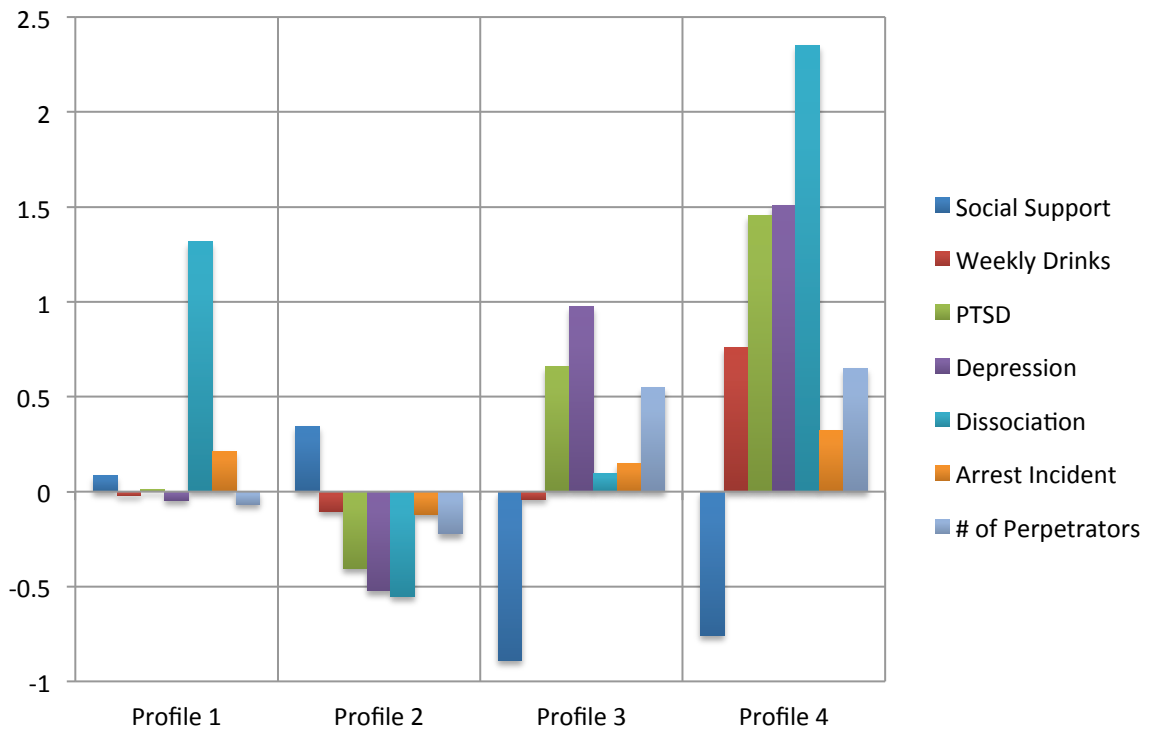


Figure 1. Standardized profile group means for all variables. Person-oriented analyses indicated the presence of four unique profiles of women within the larger study sample: Profile 1 ( $n = 21$ ), *High Dissociation, Low Depression/PTSD*; Profile 2 ( $n = 150$ ), *Low Symptoms, High Social Support*; Profile 3 ( $n = 41$ ), *Low Dissociation, High Depression/PTSD*; and Profile 4 ( $n = 22$ ), *High Symptoms, Low Social Support*.

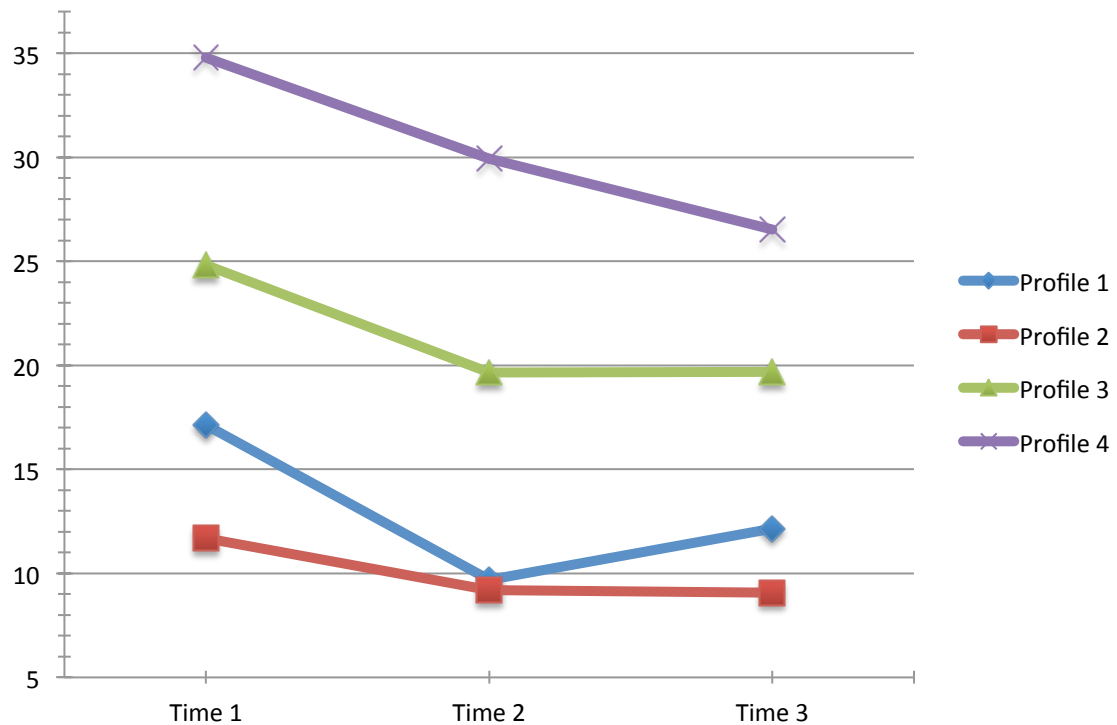
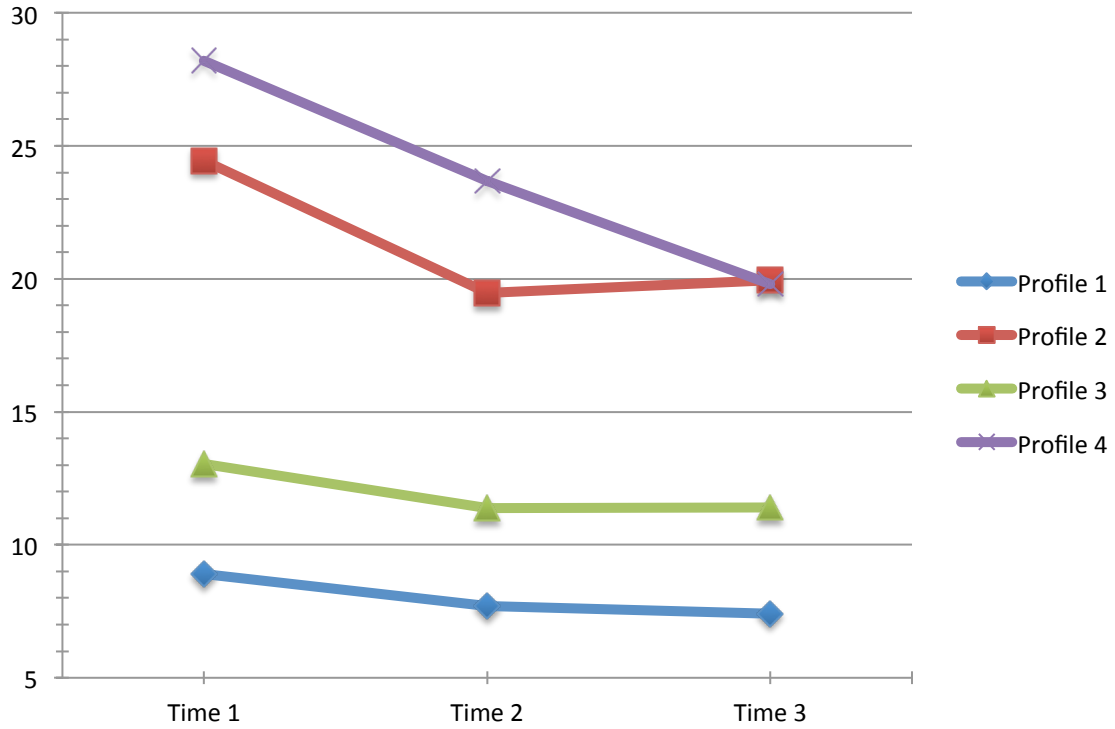


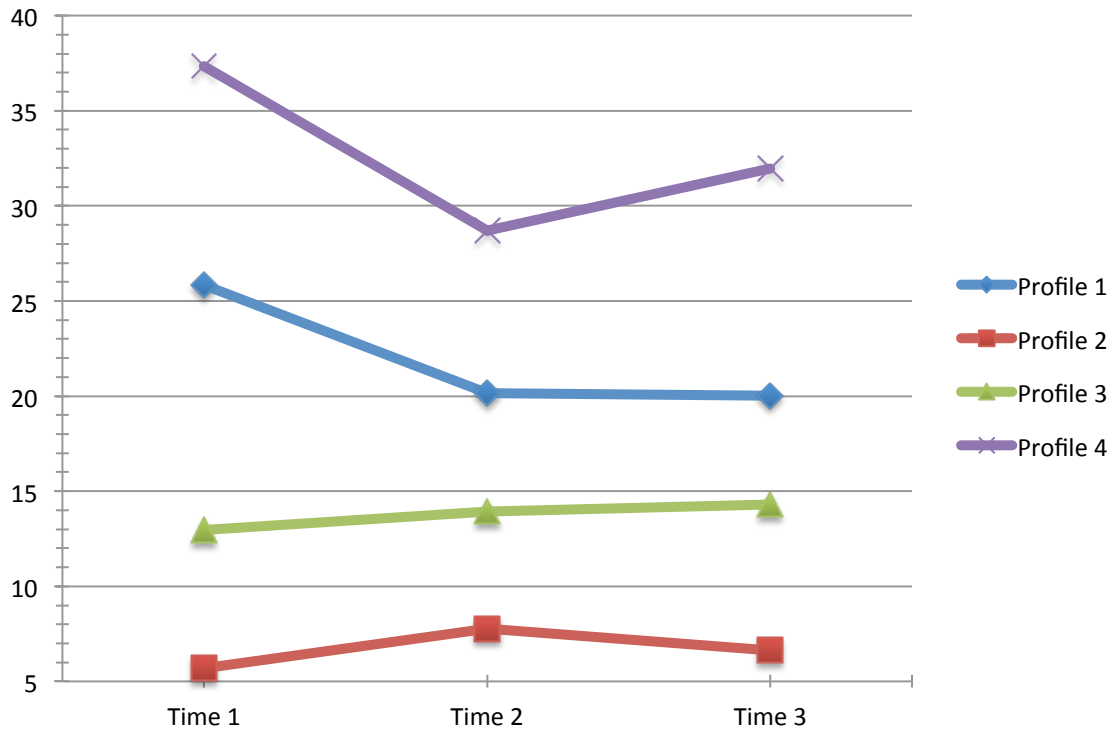
Figure 2. Mean PTSD symptoms over time by profile group. Profile 1 ( $n = 21$ ), *High Dissociation, Low Depression/PTSD*; Profile 2 ( $n = 150$ ), *Low Symptoms, High Social Support*; Profile 3 ( $n = 41$ ), *Low Dissociation, High Depression/PTSD*; and Profile 4 ( $n = 22$ ), *High Symptoms, Low Social Support*.

**2b. Do symptom trajectories differ among latent subgroups?** After identifying the latent profile groups within the larger sample at T1 only, we assessed for possible differences in symptom trajectories among profiles by examining the effect of time and profile status on PTSD symptoms and depression symptom levels, dissociation, and weekly alcohol consumption across T1, T2, and T3 (see Table 5). We used linear mixed-effect models for repeated measures, which are described in detail in the results section for research question 1b. Each set of analyses specified a symptom measure as the outcome, and included time (T1, T2, and T3; T4 was excluded from the analyses due to

comparatively small sample size) plus the addition of profile status (Profiles 1-4) as fixed factors. For profile trajectories for individual measures, see Figures 2-5.



*Figure 3. Mean depression symptoms over time by profile group. Profile 1 (n = 21), High Dissociation, Low Depression/PTSD; Profile 2 (n = 150), Low Symptoms, High Social Support, Profile 3 (n = 41), Low Dissociation, High Depression/PTSD; and Profile 4 (n = 22), High Symptoms, Low Social Support.*



*Figure 4. Mean dissociation over time by profile group. Profile 1 (n = 21), High Dissociation, Low Depression/PTSD; Profile 2 (n = 150), Low Symptoms, High Social Support; Profile 3 (n = 41), Low Dissociation, High Depression/PTSD; and Profile 4 (n = 22), High Symptoms, Low Social Support.*

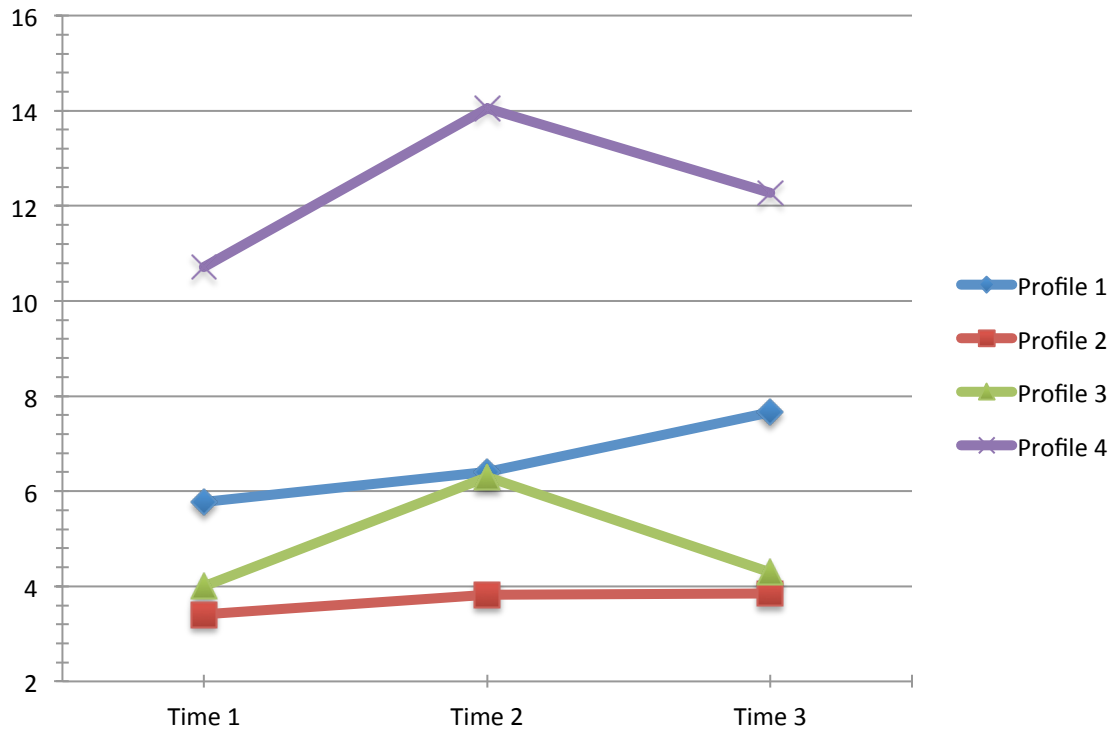


Figure 5. Mean alcohol use over time by profile group. Profile 1 ( $n = 21$ ), *High Dissociation, Low Depression/PTSD*; Profile 2 ( $n = 150$ ), *Low Symptoms, High Social Support*, Profile 3 ( $n = 41$ ); *Low Dissociation, High Depression/PTSD*; and Profile 4 ( $n = 22$ ), *High Symptoms, Low Social Support*.

We began by examining the effects of time and profile status on depressive symptoms. There was a significant effect of time ( $F(2, 388.58) = 14.09, p < .001$ ) on depression, with symptoms decreasing over time. There was also a significant relationship between profile and depression ( $F(3, 231.82) = 57.94, p < .001$ ) with Profile 4 and Profile 2 reporting significantly higher symptoms than Profile 1 or Profile 3. There was a significant interaction between profile status and change over time ( $F(6, 386.62) = 2.63, p < .05$ ) indicating that women's change in depression scores across time differed according to profile status.



In examining dissociation, we again found a significant effect of time on symptoms ( $F(2, 392.86) = 5.67, p < .001$ ), with dissociation decreasing from T1 to T2 as well as T1 to T3. We found that profile status had a significant impact on levels of dissociation ( $F(3, 240.15) = 133.90, p < .001$ ), with women in Profile 4 reporting significantly higher average DES scores than women in all other profiles, while women in Profile 1 were significantly more dissociative than women in Profile 2 or Profile 3, and women in Profile 2 were less dissociative than all other profiles. We found a significant interaction between profile status and change over time ( $F(6, 380.01) = 5.19, p < .001$ ), suggesting different symptom trajectories among the profiles. Specifically, women in Profiles 3 and 4 reported decreases in dissociative symptoms from T1 to T2, but reported slight increases from T2 to T3.

Next, we examined PTSD symptoms. We found a significant main effect of time on symptom levels ( $F(2, 392.86) = 17.39, p < .001$ ), which decreased over time. We also found a significant main effect of profile status on PTSD symptoms ( $F(3, 234.65) = 52.91, p < .001$ ), with women in Profile 3 reporting significantly greater PTSD symptom scores across time than women in Profile 1 or 2, and women in Profile 4 reporting higher PTSD symptoms than all other profiles. Finally, we did not find a significant interaction effect between time and profile status ( $F(6, 390.68) = 1.46, p = .18$ ).

We examined the impact of time and profile status on social support. We found a significant main effect of time on levels of social support, with social support increasing over time ( $F(2, 369.79) = 5.10, p < .01$ ). We also found a main effect of profile on social support ( $F(3, 226.77) = 21.72, p < .001$ ), with women in Profile 1 and Profile 2 reporting significantly greater social support than women in Profiles 3 and 4. However, we did not

find a significant interaction between time and profile, suggesting that change over time did not differ by profile ( $F(6, 368.80) = 0.78, p = .58$ ).

For the final mixed-effects model, we assessed the impact of time and profile status on average weekly alcohol consumption. We found a marginal main effect of time on average drinks per week ( $F(1.86, 360.80) = 2.93, p = .05$ ), with alcohol use increasing over time. We did not find a main effect of profile status on alcohol consumption ( $F(3, 327.44) = 11.52, p < .001$ ), with women in Profile 4 consuming significantly more alcohol per week than women in Profiles 1, 2, or 3. We did not find a significant interaction between time and profile ( $F(6, 356.71) = 1.01, p = .41$ ), suggesting that change over time was unrelated to profile status.

## **Chapter Six: Discussion**

The present study examined several key correlates of trauma, including PTSD, depression, and alcohol abuse, within a sample of IPA-exposed women. Importantly, this research included a sample of women who were recruited very quickly after a documented incident of IPA. The present study used variable-oriented analysis methods, which explore linear relationships between variables; further, we utilized person-oriented analyses methods as a complementary approach to traditional analyses. These person-oriented analyses were used to identify groupings (or “profiles”) of women who shared similar symptoms profiles within the larger study sample, and to explore the characteristics that distinguish these groupings from one another. This combined approach to analysis has become increasingly common in recent years, and represents a more nuanced understanding of the factors that impact women in wake of IPA exposure.

### **Question 1. Understanding IPA-Related Correlates From a Variable-Oriented Approach.**

**1a: How are symptom dimensions and related characteristics associated among women exposed to IPA?** Correlations between key variables of interest revealed that symptoms of PTSD, depression, and dissociation were significantly comorbid with one another across all four time points. This finding is highly consistent with prior research demonstrating relationships among these variables, and highlights the extent to which multiple psychiatric symptom domains can be adversely impacted following

exposure to trauma. We also found that greater weekly alcohol consumption was also correlated with increased PTSD, depression, and dissociation symptoms. Correlations between arrest incident severity and lifetime number of perpetrators of interpersonal violence, both of which were measured at the first study visit, revealed that both factors can be associated with psychiatric symptoms and alcohol use.

**1b. How do symptom dimensions and related characteristics change over time among women exposed to IPA?** Linear mixed-effects models were utilized to assess differences between latent profiles; additionally, these analyses served as an exploration of participant symptom trajectories by assessing the main effect of time on symptom levels. These analyses revealed overall decreases in PTSD, depression, and dissociation over time. More specifically, participants reported significant decreases in scores across all of these dimensions between the baseline visit (T1) and T2, and this trend continued at T3, when women again reported scores that were significantly lower than baseline. However, for each of these measures, the overall change in scores between T2 and T3 was not significant. For the models assessing PTSD and depression, average scores on these measures continued to decrease between T2 and T3, though the decrease was not statistically significant. These results suggest that, within a larger trajectory of symptom decline over time, the most substantial decrease in symptoms on these three measures occurred in the initial 6-month period following the arrest incident and baseline visit, while symptom decline may have slowed during the subsequent 6-12 month period. The trajectory of dissociation level over time also suggested significant decrease over the course one year following the arrest incident and baseline visit. These overall findings are encouraging; they indicate that in general, women reported symptom reduction in

multiple areas over the course of the study. As reported in a recent publication related to the current study (see DePrince, Labus, Belknap, Buckingham, & Gover, 2012), a subset of 129 women from the current sample was randomized to one of two community-coordinated response programs following the arrest incident. Results showed that women who were contacted directly by a community-based victim advocate reported decreased PTSD and depression symptoms one year after the initial study visit, while women who received referrals to (but were not contacted by) community-based advocates reported increased symptoms. While we do not have the ability to determine all of the specific factors that influenced these reductions, we can conclude that many of the women in our sample experienced resilience and improvement in psychological functioning over time in the aftermath of IPA.

The model assessing social support indicated a positive slope in support between the baseline visit and T3. While mean social support also increased between T1 and T2, the difference was not significant; the slope of the overall trend towards increased social support over time may have been too slow to be significant between the first two visits, or may have increased more rapidly or substantially as more time passed since the arrest incident. As discussed in regards to the previous longitudinal analyses, these findings indicate that women are often able to access increased social support over time following IPA exposure. While we did not examine the potential relationship between social support and symptoms in detail in the current study, prior research suggests that social support is a protective factor against a wide range of deleterious psychiatric symptoms, and the increase in social support that was reported by the women in our sample may have contributed to the general decline in other symptoms.

Similarly, there was a significant upward trajectory of mean weekly alcohol consumption between T1 and T2, while alcohol consumption decreased slightly between T2 and T3. The overall trajectory may reflect an increase in alcohol consumption as a coping strategy in response to negative emotions and experiences following exposure to IPA. If this is the case, the insignificant change between T2 and T3 may reflect a plateau in the rate of increased alcohol consumption over time. Of note, the main effect of time on alcohol use was only marginally significant ( $p = .054$ ), suggesting that these results should be interpreted with caution.

## **Question 2. Understanding IPA-Related Correlates From a Person-Oriented Approach.**

**2a. Are there distinct latent subgroups among women exposed to IPA?** We selected LPA for our analysis in order to assess for meaningful subgroups within the larger sample based on symptom measures (PTSD, depression, dissociation, and alcohol use) and related factors (social support, arrest incident severity, and lifetime number of perpetrators). Our LPA identified four distinct profiles. Twenty-one women (9%) were in Profile 1, with high dissociation scores and low social support. One hundred and fifty women (64%) were in Profile 2, with low symptom scores and high social support. Forty women (17%) were in Profile 3, with low dissociation and more perpetrators. The remaining twenty-two women (9%) in Profile 4 had very elevated symptoms and low social support. The number of women in Profiles 1 and 4 were relatively low; however, prior studies using LPA have also identified groups that represented a small percentage of the full sample (see Copeland-Linder, Lambert, & Ialongo, 2010). The group

classification probabilities were high for all four profiles, and were highest for Profiles 1 and 4.

Women in Profile 2 show low scores across all symptom measures, have low incident severity and lifetime number of perpetrators, and high social support; in fact, their symptom scores and levels violence of exposure are lower than those of any of the other three profiles, and their level of social support is higher than those of the other three profiles. In contrast, women in Profile 4 show the opposite pattern, with the highest levels of symptom severity and violence exposure of any of the profiles, and markedly lower social support than Profiles 1 and 2. These opposite trends are unsurprising given previous research establishing that 1) multiple comorbidities (e.g., depression, PTSD, alcohol abuse) are known to exist in women who have been exposed to trauma (Golding, 1999; Goodman, Koss, & Russo, 1993); 2) repeated, severe violence exposure is associated with increases in symptoms (Alexander, 2009); and 3) social support has been established as a strong protective factor against multiple domains of psychiatric symptoms (Coker, Smith, Thompson, McKeown, Bethea, & Davis, 2002; Coker, Watkins, Smith, & Brandt, 2003), including the symptoms domains that were included in our LPA. There are multiple explanations that may account for our findings, including the possibility that social support helped to protect women in Profile 2 from symptoms that may otherwise have developed following IPA. Another possibility is that women in Profile 4 were likely to be isolated from others as a function of increased IPA severity, which in turn limited the protective effects of social support. Isolation from social support in Profile 4 may also increase women's risk for chronic victimization. For example, a perpetrator's efforts to socially isolate their partner serves to increase power and control

by limiting the victim's access to emotional, legal, and practical support, including support that may enable the victim to leave the relationship. (Coohey, 2007; Katerndahl, Burge, Ferrer, & Wood, 2013). The LPA is cross-sectional and does not permit conclusions about the development of these opposite patterns. However, given the dramatic differences between these two profiles, these results highlight the need for person-centered analytic approaches that do not assume homogeneity among women who have experienced IPA.

We observed another important contrast between the other two profiles. Women in Profile 1 had higher social support and fewer lifetime perpetrators, while both groups were roughly equivalent in alcohol consumption and arrest incident severity. However, their differences on three core symptom measures (depression, PTSD, and dissociation) were striking. Women in Profile 3 were elevated on depression symptoms, with a mean score of 24.4 ( $SD = 6.2$ ) within the "Moderate" range of the BDI, and an elevated PTSD symptom score of 24.8 ( $SD = 9.5$ ) within the "Moderate to Severe" range of the PDS, while their dissociation was relatively low in comparison to the rest of the sample. In contrast, women in Profile 1 were low on measures of depression symptoms, with a mean score of 13.0 ( $SD = 7.3$ ) just within the "Minimal" range of the BDI, and a lower PTSD symptom score of 17.1 ( $SD = 11.7$ ) within the "Moderate" range of the PDS, but were notably high in dissociation. The recommended Dissociative Experiences Scale (DES) clinical cutoff in treatment settings is 30 (Waller, Putnam, & Carlson, 1996), which makes Profile 1's mean dissociation score of 25.8 ( $SD = 5.05$ ) fairly striking within the context of a non-treatment seeking sample, while Profile 3's mean DES score of 12.9 ( $SD = 4.5$ ) is more typical of low dissociation samples. One explanation for marked contrast



between the two profiles on these three symptom measures (PTSD, depression, and dissociation) is the possibility that women in Profile 1, while reporting lower levels of depression symptoms and PTSD symptoms, are employing dissociation (consciously or subconsciously) to reduce levels of anxiety and distress. In contrast, women in Profile 3 may report much higher levels of depression and PTSD symptoms because they are less likely or able to use dissociation to cope with related anxiety and distress. As stated previously, the LPA is cross-sectional and does not permit conclusions about the development of these opposite patterns. However, the notable contrast between these two profiles warrants future investigation of the trajectory of this distinct dissociative pattern over time. If this pattern is in fact a unique manifestation of posttraumatic symptomatology, the use of dissociation may reduce anxiety and distress in the shorter term; however, chronic dissociation and avoidance may have deleterious effects on other domains, such as risk detection or openness to positive emotional experiences.

One strength of the current study was the use of variable-oriented analyses as well as person-oriented analyses. The results of variable-oriented analyses described above produced several important findings: 1) As predicted, we found significant cross-sectional associations among our key variables of interest, including symptom measures (PTSD, depression, dissociation), alcohol use, social support, prior victimization, and IPA exposure; 2) We found that most of these associations were consistent across time points; and 3) We identified variables that predicted or contributed to variance among our key outcome measures. These findings reflect patterns of relationships *among variables* in our study, and informed the subsequent use of analyses that assessed patterns of relationships *among individuals* in our sample. For example, our analyses revealed an

association between increased depression and increased dissociation symptoms, an increase in dissociation in conjunction with arrest incident severity, and indicated that higher levels of dissociation were related to increased odds of unhealthy drinking. Using a variable-oriented approach, we might assume that these findings could be applied uniformly to our entire sample, and expect that women who report higher levels of dissociation will also report increased depression, greater arrest incident severity, and a higher likelihood of unhealthy drinking. However, this assumption is predicated on the notion that our sample is homogenous, and that the relationships between constructs (e.g. depression and dissociation) are consistent among participants. Our person-oriented analyses were selected to test the hypothesis that women in our study might present with patterns of symptom endorsement that differed from that of the entire sample, and that women could be grouped according to these specific patterns. This prediction was supported by the results of our LPA. For example, results indicated the presence of a subgroup of women (Profile 4) who did report high dissociation, greater depressive symptom severity, increased arrest incident severity, and higher weekly alcohol consumption, as we might have predicted based on relationships among variables in the full sample. However, the LPA also identified a subgroup of women (Profile 1) who reported high dissociation but did not report high levels of depression, greater arrest incident severity, or higher alcohol consumption, as well as a subgroup of women (Profile 3) who reported relatively low dissociation, incident severity, and alcohol consumption, but high levels of depression. The current study provided important observations about broader trends among the full sample, but also provided us with a

more nuanced understanding of ways in which subgroups of individuals differed from the larger sample.

**2b. Do symptom trajectories differ among latent subgroups?** Having established the presence of several distinct profiles within our larger sample, we wanted to assess the nature of profile differences on several measures across time points: PTSD, depression, dissociation, social support, and alcohol use. We found a main effect of profile status on average score across time points for all of these measures. Given that these measures represented most of the T1 variables that were included in the LPA in order to identify latent profiles, this finding was unsurprising. Data points from repeated measures tend to be correlated within individuals (Gueorguieva & Krystal, 2004), and even in light of our finding that time was associated with changes in symptom levels in the full sample, differences in mean symptom levels between profiles seemed to remain consistent even as the profile means increased or decreased. While the consistency of profile differences over time was not surprising, they may be accounted for by several difference factors that were illustrated by the LPA. For example, the main effect of profile status on alcohol consumption indicated that women in Profile 4 reported substantially higher alcohol consumption than did women in all other profiles. This finding is to be expected, given that the LPA seems to have identified Profile 4 by the notably elevated symptom levels across *all* domains. The substantial body of research establishing comorbidities among substance abuse and the other symptoms included in the LPA seems to support the finding that alcohol use is consistently higher among the one profile with global (compared to Profiles 1 and 3) symptom elevations.

We found significant interaction effects of profile status on symptom trajectories over time for several measures, suggesting meaningful variance in symptom trajectories between the latent profile groups. For example, when examining depressive symptoms, analyses indicated differences over time as a factor of profile status. The main effect of time on depression suggested an overall reduction in symptoms over time, with significant decreases occurring between T1 and T2 and T1 and T3. An examination of profile-level trajectories suggested that women in Profiles 1 and 3 reported symptom decreases over the course of the first two time points, followed by smaller decreases between the second and third time points. In contrast, women in Profile 2 reported larger decreases in depression between T1 and T2, followed by minimal change between T2 and T3, while women Profile 4 reported larger and steadier decreases in depression over the three visits. In assessing the impact of profile status on change in dissociation over time, we again found a significant interaction. In terms of the overall sample, our analyses suggested a general and significant decrease in dissociation from T1 to T3, with a significant decline in dissociation from T1 to T2 followed by a slight (and non-significant) increase from T2 to T3. Further examination of the profile trajectories provided further insight into the overall model: women in Profiles 2 or 3, who also reported low initial levels of dissociation, endorsed minimal fluctuations in dissociation between time points; in contrast, women in Profiles 1 and 4, who also reported relatively higher initial levels of dissociation, reported initial decreases in dissociation between T1 and T2, followed by minimal change (Profile 1) or small increases (Profile 4) in dissociation between T2 and T4. These findings highlight the extent to which person-oriented analyses can enhance our variable-oriented understanding of the data; the current

study identified groups of women according to different profiles at the initial assessment, established consistent profile differences across time, and also found that the trajectories differed between profiles on two key measures.

### **Limitations**

Several limitations impacted the present study. First, we were unable to retain all participants over the course of all study visits, resulting in missing data for some women. While a large percentage of women (87%) returned for the T2 and/or T3 visit, several factors contributed to the lower retention rate (32%) for the T4 visit, including losing track of participants when they relocated over the longer course of time between the T3 and T4 study visits, reduced funding for participant compensation, and lack of funding available for cab vouchers. We attempted to address this issue by including T4 data only in cross-sectional analyses, and selecting several analyses that were able to partially account for missing data at T2 and T3. Second, the current study was designed specifically for female participants whose male partners had recently been arrested, and so the study's findings may not generalize to IPA in other gender configurations (e.g. same-sex couples, male victims, etc.). While the study measures included an assessment of typical alcohol use, this assessment only included the frequency and quantity of alcohol consumed by participants. While our study variables adhered to the NIDA-Modified Alcohol, Smoking, and Substance Involvement Screening Test (NMASSIST) guidelines for assessing "unhealthy drinking" and "binge/at-risk" drinking, in the absence of a more thorough assessment of contextual factors, including historical patterns as well as the current impact (if any) of alcohol use on individual functioning, it is not possible to draw formal conclusions regarding the presence of alcohol abuse or dependence. Second,

while the T1 interviews were held within a median of 26 days following the *target* arrest incident (i.e., the particular incident for which an arrest was made during the study recruitment period), this arrest represented the first and only experience of IPA for some women, while many women reported one or more previous incidents of violence (for which the perpetrator had or had not been arrested), as well as incidences of violence by one or more partners previous partners. In short, while our sample included a wide range of prior experiences with IPA, it would have been impossible (given time constraints) to assess a complete trauma history for each participant. We did include one historical trauma variable (lifetime number of perpetrators) in our analyses, but we cannot know what effect previous exposures to violence had on women prior to our T1 assessment.

### **Future Directions and Implications**

The current study highlights several important issues that researchers should consider in future work on the risk factors and consequences associated with IPA. The results of the current study have important clinical implications for the treatment of PTSD symptoms and alcohol abuse. We found positive correlations between weekly alcohol use and PTSD symptoms at two time points, and we also found that unhealthy alcohol use at the baseline visit was predictive of higher PTSD symptoms averaged over the course of the first three study visits. The measures used in our study captured the frequency and quantity of alcohol consumption, which we classified further according to NIDA guidelines for “healthy” and “binge” alcohol use, but we were not able assess alcohol abuse or dependence based on our data. We also assessed PTSD symptoms but did not diagnose PTSD. However, these findings are supported by previous research suggesting that exposure to IPA increases the risk for higher alcohol consumption in

women, and by extension they may be consistent with broader findings that PTSD and substance abuse are highly comorbid and are risks factors for one another.

Several factors may partially account for the relationship between alcohol use and PTSD symptoms in the current study. Specifically, we found that dissociation was associated with increased PTSD symptoms at all four visits, and that dissociation was predictive of at-risk alcohol use at T1. Taken together, our results support broader findings demonstrating the co-occurrence of substance abuse and other psychiatric symptoms, including PTSD symptoms. In recent years, clinical researchers have advocated for a combined approach to the treatment of co-occurring SUD and PTSD, based on evidence that individuals may have different needs, skills deficits, and barriers to treatment than individuals with only one of these disorders. For example, “gold standard” evidence-based treatments for PTSD require that patients be as emotionally present as possible during the intervention, and active substance abuse during treatment (e.g. drinking in order to avoid negative emotional responses to homework assignments or session content) can adversely affect treatment outcomes. At the very least, clinicians who failure to assess for substance abuse before and during PTSD treatment may overlook an important barrier to treatment success. Similarly, evidence-based treatment for SUD generally requires abstinence from, or dramatic reduction in, substance use during treatment. Trauma-exposed patients who use substances heavily may numb themselves or detach from the experience of negative trauma-related symptoms; with the cessation of substance use, patients may experience what they perceive to be a sudden re-emergence or “flare-up” of PTSD symptoms, which may in turn increase the risk of relapse. For patients with co-occurring disorders, treatment that focuses only on PTSD

symptoms may be less successful in the context of substance use, while treatment that focuses only on substance abuse may increase distress by removing the “protective” effects of substance use before the patient has acquired tools to cope with trauma-related symptoms. In both cases, clinicians can increase the likelihood of positive treatment outcomes by taking both disorders into account, and co-treating both disorders whenever possible.

Our results have several implications for advocacy efforts and clinical interventions. We identified subgroups of women who differed from the larger group means, symptom patterns, and trajectories of the full sample, indicating meaningful variance in the ways that women respond to IPA. This suggests that women may vary in the ways that they present to those within the system, including advocates, judicial system representatives, etc. One profile (Profile 2) included women with strong social support, fewer previous perpetrators of interpersonal violence, and relatively lower levels of IPA severity; women in this profile also reported lower symptom severity on all study measures. In contrast, a second profile (Profile 4) included women with more severe arrest incident severity, more lifetime perpetrators, and weaker social support, and these women also reported universally higher symptom severity. The two profiles reflect near-opposite patterns of symptom endorsement and environmental factors, and it is not difficult to imagine that the women included in these profiles may have required different approaches (e.g. resources, referrals, advocacy) on the part of those they encountered within the judicial system. For example, women who are more similar to those in Profile 2 may be more equipped to navigate the system independently because they are able to draw upon their social supports to provide advice and assistance, and because they



experience less impairment stemming from depression, PTSD, alcohol use, and dissociation. In contrast to women in Profile 2, women who are similar to those in Profile 4 may have difficulty navigating the system due to the impact of trauma-related symptoms, and may be especially likely to benefit from access to clinical services in conjunction with standard victim outreach efforts. Women who are similar to those in Profile 4 may also benefit from additional outreach and guidance from advocates within the system. In comparing women in Profiles 1 and 4 (higher dissociation) to women in Profiles 2 and 3 (lower dissociation), we could predict that dissociation might contribute to the perception that women in Profiles 1 and 4 are less engaged in, or committed to, certain aspects of involvement with the system, such as collaborating with the prosecution, seeking resources, or following up with system-based advocates, while women in Profiles 2 and 3 are more present in their interactions with the system. Conversely, we could predict that dissociation may enable women to participate more fully in the system by serving as a “protective” factor against difficult emotional responses elicited by their involvement. Extending our current results, we could also predict that women in Profiles 3 and 4 reported more lifetime perpetrators of violence and therefore may have had more “opportunities” to interact with the system in the past. Although we did not include prior interactions with the justice system in our analyses, women in these profiles may have had more data points (both positive and negative) to inform their perceptions of the justice system; depending on the nature of their previous experiences, they may differ in their preferences for the extent and type of their own involvement in the system. Further research that is focused more explicitly on women’s involvement with advocates and the justice system would be needed in order to evaluate

approaches that may be more beneficial to women in specific subgroups, and to assess potential contributing factors that we did measure or not include in our analyses.

However, our findings suggest that a “one size fits all” approach on the part of advocates and judicial system representatives may not be sufficient.

The other two profiles identified by the LPA also showed important differences that may have implications for our approach to clinical interventions. For example, women in Profile 3 endorsed high levels of PTSD symptoms and depression symptom severity, but relatively low levels of dissociation. In contrast, women in Profile 1 endorsed relatively low levels of PTSD symptoms and depression symptom severity, but very high levels of dissociation. While both groups of women may be experiencing significant adverse effects related to exposure to violence, they may be perceived very differently from a clinical standpoint, and may require very different clinical approaches. First, because the women in Profile 1 do not report as many symptoms of depression or PTSD, they may be much less likely to elicit concern from friends, family, or coworkers, to be referred for treatment, or to seek treatment for themselves. Second, even when women from both profiles do present for treatment, women like those in Profile 2 may appear to be “less severe” and less in need of clinical services than women similar to those in Profile 3 in the eyes of clinicians who are not familiar with dissociative symptoms. Finally, women with higher levels of dissociation in response to violence exposure may require different approaches to clinical intervention.

Women in Profile 4 tend to report much higher symptom levels than women in all other profiles, including greater PTSD, depression, dissociation, and alcohol use. They also report more lifetime perpetrators, which may explain the severity of their symptoms,

and may also indicate that they would respond well to longer and more intensive intervention to address the effects of trauma histories that are long-standing and complex. Women in Profile 4 also report low levels of social support, as do women in Profile 3, which may call for intervention approaches that include a targeted emphasis on establishing peer connections, social engagement, and the development of group-focused activities and hobbies. Efforts to increase social support may help to reduce women's current symptoms in addition to protecting against future symptom development, and may also reduce isolation from others who could provide more tangible support to women who choose to leave violent relationships.

## **Chapter Seven: Conclusions**

The current study demonstrated links among depression, PTSD, dissociation, and alcohol use in women exposed to IPA, as well as links between the aforementioned psychological symptoms and increased exposure to violence. Results also suggest that social support is related to decreased psychological symptoms and (in some cases) violence exposure. The variable-oriented analyses in the current study provided important information about general relationships among variables across the entire sample, as well as information about the nature of these relationships over time. Our latent profile analysis built upon these findings by using multiple symptom measures (depression, PTSD, dissociation, and alcohol use) as well as several related factors (arrest incident severity, social support, and lifetime number of perpetrators) to identify four distinct profiles within the larger sample. The results of the current study do not suggest that one approach is superior to the other; rather, we advocate for the use of person-oriented analyses in order to enhance and expand upon information gathered from more traditional variable-oriented methods. From a theoretical standpoint, it is important to account for the possibility of heterogeneity between subsets of individuals who have experienced IPA. When true distinctions are found among these subsets of individuals within broader populations, we cannot accurately examine factors that contribute to the development, course, and treatment of trauma-related symptoms and comorbidities by categorizing trauma-exposed women as a (relatively) homogenous group. Above all other findings, the

current study supports the use of more nuanced examinations of heterogeneous patterns among individuals in addition to broader and more general assessment.

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