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Complex Traumatic Stress in Substance Abuse Treatment

A Dissertation submitted in partial satisfaction of the

requirements for the degree of Doctor of Philosophy

in Counseling, Clinical, and School Psychology

by

Megan T. Donahue

Committee in charge:

Professor Merith Cosden, Chair

Professor Michael Furlong

Professor Steve Smith

September 2014

The dissertation of Megan T. Donahue is approved.

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Professor Michael Furlong, Ph.D.

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Professor Merith Cosden, Ph.D., Committee Chair

June 2014

Complex Traumatic Stress in Substance Abuse Treatment

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by

Megan T. Donahue

ACKNOWLEDGEMENTS

CURRICULUM VITA

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EDUCATION

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Ph.D. in Combined Psychology, Department of Counseling, Clinical, and School Psychology,
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M.A. in Counseling Psychology, *June 2010,* Thesis: *Considering gender, trauma, and psychological distress in substance abuse treatment: What matters most?*

Northwestern University, Evanston, IL

M.A. in Learning Disabilities, *August 2005*

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HONORS AND AWARDS

University of California, Santa Barbara, CA

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Northwestern University, Evanston, IL

2005 Distinction in Graduate Studies, Recognition of excellence by Dr. Doris Johnson
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2004 Lambda Phi Eta, National Communication Honors Society, Inaugural Member
2003 Undergraduate Summer Research Grant
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PROFESSIONAL AFFILIATIONS

American Psychological Association, Divisions 39, 53, & 56, Student Member
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PUBLICATIONS

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Sanford, A., **Donahue, M.T**., & Cosden, M. (2014). Consumer perceptions of trauma assessment and intervention in substance abuse treatment. *Journal of Substance Abuse Treatment,* 47, 233—238. doi: 10.1016/j.jsat.2014.05.011

Cosden, M. & **Donahue, M.T.** (2012). Auditory processing in youth and adults with learning disabilities: Impact on social information processing. In T.P. Long & L. R. Eifert (Eds.) *Speech Processing and Auditory Processing Disorders: Causes, Diagnosis and Treatment*. Nova Science: Hauppauge, NY.

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PROFESSIONAL PRESENTATIONS

Cosden, M., Hopsicker, R**., & Donahue, M.T**.., Hughes, J., & Boles, S. Providing Trauma-Informed Substance Abuse Treatment. Colloquium presentation at the American Psychological Association Annual Convention, Washington, DC. August, 2011.

Cosden, M., Hopsicker, R.J., & **Donahue, M.T.** *Providing Gender Specific Trauma- Informed Substance Abuse Treatment*. Presented at the 15th International Conference on Violence, Abuse & Trauma, September 13, 2010, San Diego, CA

Donahue, M.T, Hopsicker, R.J, Benki, C, Hughes, J., & Cosden, M.A. *Differences Between Men and Women in Trauma-Informed Substance Abuse Treatment*. Poster presented at the American Psychological Association Annual Conference, August 12, *2010*, San Diego, CA.

Cosden, M.A., Flores, R., Gottlieb, N., & **Donahue, M.T**. *Implementing a Trauma- Informed System of Care in a Drug Court.* Presented at the National Association of Drug Court Professionals Sixteenth Annual Conference, June 3, 2010, Boston, MA.

Cosden, M.A., Tawalbeh, S, & **Donahue, M.T.** *A Systematic Review of Parental Notification for Drinking Violations*. Presented at the Association for Psychological Science 21st Annual Conference; May 22, 2009, San Francisco, CA.

PROFESSIONAL SERVICE

University of California, Santa Barbara
June 2012 – June 2013 APA Self-Study Preparation Committee
September 2009- 2010 Curriculum Committee
September 2009- 2010 Student Affairs Committee

RESEARCH EXPERIENCE

University of California, Santa Barbara, Santa Barbara, CA
October 2008 — June 2012, **Graduate Research Assistant**
Program Evaluation of: Methamphetamine Recovery Services (SAMHSA), Clean and Sober Drug Court (SAMHSA), CA AB109 & SB678 in Santa Barbara County,
Assisting principle evaluator of grant-funded programs that provides enhanced mental health and trauma-informed substance abuse treatment in a drug court. Responsibilities include: database creation, data analysis, writing biannual reports, training, conducting satisfaction surveys with program participants, developing procedures for data management, and attending monthly collaborative meetings with committee members representing the legal, criminal justice, mental health treatment, and Santa Barbara County Alcohol & Drug Program administration. Supervisors: Merith Cosden, Ph.D. & Jill Sharkey, Ph. D.

CLINICAL EXPERIENCE

Astor Services for Children and Families, Rhinebeck & Poughkeepsie, NY
August 2013 – August 2014, Predoctoral Psychology Intern
Provide individual and family psychotherapy with children, adolescents, and families in residential milieu and outpatient clinic. Complete comprehensive assessments including cognitive, neuropsychological, achievement, and personality testing. Training and supervision in providing evidence-based treatments including Play Therapy, Trauma-Focused Cognitive-Behavioral Therapy, and Dialectical Behavior Therapy. Collaborate with Child Welfare Services, psychiatrists, community schools and treatment providers to inform treatment planning and service delivery. Complete rotation in supervision and program evaluation. Director of Clinical Training: Athena Drewes, Psy.D.

Child & Adolescent Psychology Private Practice, Santa Barbara, CA
October 2011 – July 2013, Psychological Assistant (PSB-36432)
Provide a range of child clinical psychology services including comprehensive psychoeducational evaluations, individual psychotherapy, school observations & interventions, family therapy, and consultation. Integrated assessment battery includes a clinical interview, behavior rating forms from multiple respondents, cognitive assessment, academic achievement testing, neuropsychological measures (e.g., NEPSY-II; CPT-II, Rey), a comprehensive written report with extensive recommendations, and collaborative feedback sessions. Psychotherapy caseload currently focuses primarily on adolescents reporting symptoms of anxiety and/or depression and comorbid ADHD using integrated theoretical approach to treatment. Supervisor: Carrie Towbes, Ph.D.

Child Abuse Listening and Mediation (CALM), Santa Barbara, CA
September 2010 – August 2011, Psychology Extern (PSB-33504)
Conduct individual and family psychotherapy with children, adults, and families for whom traumas such as recent or past child abuse, substance abuse, and family violence was a major treatment concern. Clients frequently presented with PTSD and severe mood and behavioral disorders. Ran groups for children ages five to seven exposed to domestic violence. Use evidence-based treatment methods, including Play Therapy, Trauma-Focused Cognitive-Behavioral Therapy, Parent- Child Interaction Therapy (PCIT), and Dialectical Behavior Therapy. Collaborate with Child Welfare Services, psychiatrists, and community schools and treatment providers to inform treatment planning and service delivery. Supervisors: Carrie Towbes, Ph.D. & Jessica Adams, Ph.D.

CLINICAL EXPERIENCE (continued)

Psychology Assessment Center, Santa Barbara, CA
September 2009 – June 2013, Student Clinician
Conduct integrated assessments with child, adolescent, and adult clients with a variety of referral questions ranging from mood, personality, attention, or learning disorders. Assessments include a clinical interview, cognitive, personality, and neuropsychological measures, and collaborative feedback sessions. Supervisors: Steve Smith, Ph.D. / Jordan Witt, Ph.D. / Steve Rogers, Ph.D.

Hosford Counseling & Psychological Services Clinic, Santa Barbara, CA
June 2009 – September 2010, **Student Therapist**
Conduct individual and family psychotherapy with children, adolescents, and adults presenting with a wide variety of concerns including personality, mood, and adjustment disorders. Consultation with clinic psychiatrist. Conduct intakes, write integrated assessment report, and case presentations to clinic administration. Supervisors: Merith Cosden, Ph.D./ Maryam Kia-Keating, Ph.D

Child Abuse Listening and Mediation (CALM), Santa Barbara, CA
May 2009 – August 2010, Assessment Specialist
Score standardized assessments of parent and child symptomatology and collaborate with assessment team to plan efficient and effective assessments for the agency. Evaluate outcome data on the efficacy of specific programs and the agency as a whole. Assessments include the Trauma Symptom Checklist, Child Behavior Checklist, Parenting Stress Index, and Beck Depression Inventory. Supervisor: Jessica Adams, Ph.D.

Northwestern University Learning Clinic, Evanston, IL
September 2004 – August 2005, Student Clinician
Design remedial, goal-specific instruction to improve academic achievement using neuropsychological strengths to bypass weaknesses. Administer, score, and interpret results of psychoeducational assessments and compose written report and specific recommendations based on diagnostic impressions. Supervisors: Doris Johnson, Ph.D. Frank van Santan, M.A.

SUPERVISION EXPERIENCE

Hosford Counseling & Psychological Services Clinic

September 2011 – October 2012, Student Supervisor
Overseeing the clinic's transition to electronic record keeping system (Point and Click) in collaboration with IT department. Assist in collaborative supervision of weekly group of four doctoral students enrolled in a basic practicum structured to develop students' psychotherapy skills including case conceptualization, psychotherapy interventions, helping skills and clinical techniques. Provide on- site supervision in department clinic observing intake interviews, managing crises, managing billing and daily clinic operations. Supervisor: Heidi Zetzer, Ph.D.

July 2010 – March 2011, Teaching Assistant for Advanced Practicum
Assist in collaborative supervision of weekly group of five doctoral student therapists to develop psychotherapy skills including case conceptualization utilizing a psychodynamic theoretical orientation, specific transtheoretical psychotherapy interventions, therapeutic assessment, diagnostic decision making, and clinical techniques. Supervisor: Steven Smith, Ph.D.

ABSTRACT

Many women with substance use disorders (SUD) have experienced complex
psychological trauma including childhood interpersonal victimization. Research confirms
that many adults seeking treatment for SUD exhibit co-occuring symptoms of PTSD leading
to the implementation of trauma-informed treatment in behavioral health and substance abuse
treatment settings. This study examined whether women in trauma-informed treatment for
SUD exhibited distinct symptom profiles of simple and complex traumatic stress, and how
symptomatology related to women's cumulative trauma history and trauma-informed SUD
treatment completion. Traumatic stress symptomatology was examined in two ways: (a)
symptom profiles based on intake *T*-scores on simple and complex posttraumatic stress
symptom domains of the Trauma Symptom Inventory (TSI; Briere, 1995), and (b)
cumulative traumatic stress symptom complexity (e.g., Briere et al., 2008; Cloitre et al.,
2009). A Ward's method hierarchical cluster analysis with k-means procedure created a
typology of traumatic stress symptomatology based upon intake *T*-scores on seven TSI
subscales for 360 women enrolled in trauma-informed SUD treatment programs. As
predicted, the clusters varied in the types, severity, and clinical complexity of traumatic stress
symptoms reported. Examination of cluster centroids and descriptive data suggested evidence
for all three traumatic stress symptom profiles hypothesized: (a) No Traumatic Stress, (b)
Simple Posttraumatic Stress subgroup, and (c) Complex/Cumulative Traumatic Stress. In
addition, the final four-cluster solution revealed a Defensive Avoidant subgroup of substance
abusing women characterized by elevated centroid scores on the Defensive Avoidance
clinical subscale of the TSI without concurrent elevation of other symptoms of simple or

complex traumatic stress. Women in all clusters reported histories of cumulative, interpersonal trauma, but the prevalence was greatest among women exhibiting complex/cumulative traumatic stress symptomatology. Program completion was similar across traumatic stress symptom clusters in both models of trauma-informed treatment. Implications for research, diagnosis, and intervention are discussed. This study calls for complex-trauma-informed assessment and treatment of co-occurring psychological trauma, traumatic stress, and SUD.

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Chapter I

Introduction

In her seminal book on interpersonal violence and complex traumatic stress, *Trauma*

and Recovery (1992b)*,* Judith Herman states:

> Psychological trauma is an affliction of the powerless. At the moment of trauma, the
> victim is rendered helpless by overwhelming force. When the force is that of nature,
> we speak of disasters. When the force is that of other human beings, we speak of
> atrocities.…Traumatic events are extraordinary, not because they occur rarely, but
> rather because they overwhelm the ordinary human adaptations to life. (p. 33)

Within clinical treatment settings, there is growing evidence suggesting that co-occurrence of

psychological trauma and substance abuse is the rule, rather than exception. Studies of

patients in substance abuse treatment typically find between 25% and 66% report a history of

interpersonal trauma (Najavits, Weiss, & Shaw, 1997), with rates as high as nearly 90% in

some clinical populations (Farley et al., 2004; McHugo et al., 2005; Simpson & Miller,

2002). Among patients seeking treatment for physical or mental health problems, studies

indicate that trauma, psychological distress, and substance use disorder (SUD) symptoms

often coexist. For instance, the large-scale Adverse Childhood Experiences (ACE) Study

assessing more than 17,000 adults in primary care settings indicated adults' retrospective

report of multiple adverse childhood experiences significantly related to substance use and

abuse (Dube et al., 2003). Within mental health and addiction treatment settings, research

finds similar interplay between patients' trauma history and SUD symptom severity has been

documented. Many women seeking treatment for co-occurring mental health problems and

SUD report a history of several potentially traumatic experiences including interpersonal

violence and victimization (Becker et al., 2005), and those patients who report histories of

trauma have more severe alcohol and drug problems than do those who did not report a history of trauma (Ouimette, Kimerling, Shaw, & Moos, 2000).

Trauma-Informed Treatment of Substance Use Disorders

In order to better address the co-occurrence of trauma, PTSD symptoms, and SUD, both researchers (e.g., Grella, 2003; Najavitz et al., 1997) and the policy advocates at the Substance Abuse and Mental Health Services Administration (SAMHSA) called for *trauma-informed* approaches to behavioral health and substance abuse treatment. In 2005, SAMHSA established the National Center for Trauma-Informed Care (NCTIC) to promote trauma-informed program implementation in an effort to shift the focus from pathologizing what is wrong with patients toward what traumatic events have happened to them. Trauma-informed interventions are defined as client services that are influenced by knowledge regarding the impact of violence and other forms of trauma on the individual (Elliott, Bjelajac, Fallor, Markoff, & Reed, 2005). A growing body of research indicates that substance abuse treatment programs that provide trauma-informed interventions result in better outcomes than do programs that provide substance abuse treatment alone (Amaro, Chernoff, Brown, Arevalo, & Gatz, 2007; Clark & Young, 2009; Farley, Golding, Young, Mulligan, & Minkoff, 2004).

Subsequently, treatment of substance abuse has begun to include specific focus on trauma-related psychological distress in both veteran and civilian populations. Drawing upon Khantzian's self-medication hypothesis (1997), trauma-informed models of substance abuse treatment often view clients' substance abuse as a symptom of their efforts to cope with posttraumatic psychological distress. In the case of posttraumatic stress responses, the self -

medication hypothesis suggests that clients utilize their alcohol or other drug addiction in order to attenuate the physiological and psychological reactivity they are experiencing. Recent research provided empirical support that the link between substance use disorders and PTSD can be best explained by the self-medication hypothesis (Ouimette, Read, Wade, & Tirone, 2010). The use of drugs and alcohol to self-medicate traumatic stress is further supported by studies showing that a history of traumatic events is most likely to be associated with substance abuse when individuals continue to experience anxiety or depression subsequent to their trauma (see Simpson & Miller, 2002, for a review).

Simple Posttraumatic Stress Symptomatology

Posttraumatic Stress Disorder (PTSD) is a commonly recognized psychiatric disorder associated with exposure to trauma and violence first included as a distinct diagnosis in DSM-III (American Psychiatric Association, 1980). According to the DSM-IV-TR diagnostic criteria, the symptoms of PTSD are organized into three domains: (a) re-experiencing the trauma in ways such as intrusive thoughts, dreams, or flashbacks; (b) avoidance of stimuli associated with the trauma, as well as general emotional numbing, and (c) increased arousal evidenced by symptoms such as hypervigilance, increased startle response, and irritability (American Psychiatric Association, 2000). Although initially based upon posttraumatic responses to war and rape, PTSD has been confirmed following exposure to a wide range of extreme life events (Keane, Marshall, & Taft, 2006). Moreover, the PTSD symptom constellation appears to characterize psychological reactions to severe stressors across cultures (Osterman & de Jong, 2007). Epidemiological research estimates that between 8% to 20% of trauma exposed individuals will develop PTSD, noting that although

men are more likely to be exposed to trauma in their lifetime, women are more likely to meet criteria for PTSD following a traumatic event (Breslau, Petersen, & Schultz, 2008; Kessler, Sonnega, Bromet, Hughes, & Nelson, 1995).

For the purpose of clarity and consistency with previous research differentiating types of posttraumatic stress symptomatology (e.g., Miller & Resick, 2007), this study will use the term "Simple PTSD" to identify the DSM-IV-TR criteria for Posttraumatic Stress Disorder symptoms.

Defining Complex Trauma

Courtois (2004) defines complex trauma as the cumulative histories of multiple traumatic stressor exposures and experiences, often of an interpersonal nature and involving severe disturbances in primary caregiving relationships. Patients suffering from complex trauma have often been victims of the coercive control of a perpetrator of sexual or physical violence over extended periods of his or her development. Unfortunately, these traumatic experiences of interpersonal violence or victimization often involve harm or abandonment by caregivers, adults or romantic partners who were supposed to be responsible and trustworthy. Neurobiological evidence suggests that complex posttraumatic states thwart brain development in the service of adapting to a constantly perceived threat (Yehuda & LeDoux, 1997) and disrupt one's ability to regulate emotional reactions (Lanius et al., 2010).

Complex Traumatic Stress Symptomatology

In the past two decades, clinical researchers in the field of trauma psychology have proposed several theoretical models defining complex posttraumatic stress symptomatology. Some researchers proposed specific diagnostic models including Complex PTSD (Herman,

1992a) and Disorders of Extreme Stress Not Otherwise Specified (DESNOS) proposed to be added to DSM-IV-TR by the PTSD task force (Roth, Newman, Pelcovitz, van der Kolk, & Mandel, 1997).

Herman's Complex PTSD. The construct of Complex PTSD (CPTSD) was developed to describe the constellation of psychological disturbance commonly observed among survivors of recurrent interpersonal abuse that was not captured by the Simple PTSD diagnostic criteria. Herman (1992b) noted several important characteristics of individuals who have endured chronic interpersonal victimization, including survivors of childhood physical and sexual abuse, political refugees seeking asylum, and children who grew up in the midst of war and genocide. First, complex trauma survivors present a, "complicated and tenacious symptom picture" commonly including somatization, dissociation, and affective dysregulation. Second, they display characteristic personality changes, including relational difficulties and disturbances of identity. Third, they are vulnerable to repeated harm, either self-inflicted or perpetrated by others.

More specifically, Herman outlined seven domains of Complex Posttraumatic Stress Disorder (CPTSD) symptomatology including: (a) *alterations in consciousness* (e.g., forgetting traumatic events, reliving traumatic events, derealization, dissociation); (b) *alterations in emotional regulation* (e.g., persistent sadness, suicidal thoughts, explosive anger, or inhibited anger); (c) *alterations in self-perception* (e.g., helplessness, shame, guilt, stigma, and a sense of being completely different from other human beings); (d) *alterations in perception of the perpetrator* (e.g., attributing total power to the perpetrator, preoccupation with the relationship to the perpetrator, preoccupied with revenge); (e) *alterations in*

relations with others (e.g., isolation, distrust, repeated search for a rescuer); and (f) *changes in one's systems of meaning* (e.g., loss of sustaining faith, sense of hopelessness and despair). In order to address this constellation of symptoms, Herman (1992b) outlined a stage-based approach to treatment that begins by addressing safety and stabilization before moving to trauma-specific psychotherapy interventions.

Disorders of Extreme Stress Not Otherwise Specified (DESNOS). Building upon Herman's CPTSD construct, during the field trials for the text revision of DSM-IV, the PTSD task force investigated the multiple domains of symptomatology associated with chronic interpersonal trauma in clinical samples and proposed the diagnostic category of DESNOS (Roth et al., 1997). The researchers developed a semistructured interview to assess the symptom domains of CPTSD/DESNOS and several studies provided evidence in support of the diagnostic validity of a complex trauma diagnosis for patients who have endured recurrent interpersonal abuse, particularly during childhood (see van der Kolk et al. [2005] for review). The emerging CPTSD research, however, did not consistently distinguish PTSD and DESNOS as distinct phenomena as originally proposed. Studies revealed that the majority of patients meeting partial or full criteria for CPTSD/DESNOS also met criteria for Simple PTSD (Ford & Smith, 2008; Roth et al., 1997).

Complex Trauma Task Force defined Complex PTSD. The International Society for Traumatic Stress Studies (ITSTSS) established a Complex Trauma Task Force who conducted an expert consensus study examining best practices in treatment of complex PTSD (Cloitre et al., 2011). Based upon the foundational constructs and available empirical literature, the authors conceptualized complex PTSD responses as including the core

symptoms of Simple PTSD, as well as self-regulatory disturbances in five psychological domains: (a) emotion regulation difficulties, (b) disturbances in relational capacities, (c) alterations in attention and consciousness, (d) adversely affected belief systems, and (e) somatic distress or disorganization. The authors noted that studies in both clinical and community samples demonstrate symptomatology in these domains following repeated interpersonal violence, and that the development of CPTSD is inversely related to the age of victimization (e.g., van der Kolk et al., 2005).

Complex PTSD diagnosis & DSM-5. In anticipation of the release of DSM-5, several scholars in trauma psychology completed an analysis of the extant literature on Complex PTSD. The authors concluded that, since completion of the DSM-IV-TR field trial studies, there has not been adequate research to empirically validate the construct of complex PTSD (Resick et al., 2012). In particular, the authors cited problems with inconsistent definition of complex trauma and Complex PTSD symptom domains, a dearth of empirically validated instrumentation assessing CPTSD, and few studies of PTSD treatments comparing Simple PTSD and Complex PTSD patients to determine clinical utility of diagnostic category. As noted by Weiss (2012), however, Simple PTSD would have been excluded from DSM-III if the empirical standards for construct validity were similar to those required for Complex PTSD for DSM-5.

Dimensional Models of Trauma and Traumatic Stress

Based upon an analytic review of the complex PTSD literature, Resick and colleagues (2012) recommended that the field of trauma psychology consider moving toward conceptualizing posttraumatic stress disorders along a spectrum of adaptations to trauma.

Several of the scholars invited to comment on the article noted that such a shift would be a beneficial step for the traumatic stress field given the problematic heterogeneity of the PTSD diagnostic category for both clinical work and research (e.g., Goodman, 2012; Herman, 2012). A more dimensional approach to trauma psychology is consistent with recent clinical (Briere & Spinazzola, 2005) and research models (Briere, Kaltman, & Green, 2008; Cloitre et al., 2009), considers both simple and complex traumatic stress concurrently, and examines the cumulative manifestation of traumatic stress over time.

Continuum of traumatic stressor complexity. In moving toward a more dimensional model of trauma and traumatic stress responses, Briere and Spinazzola (2005) propose a framework for conceptualizing psychological stressors along a *complexity continuum*. Figure 1 depicts the author's examples of the opposing extremes of the continuum based upon empirically supported variables demonstrated to impact the intensity of posttraumatic stress responses.

The continuum of posttraumatic responses considers the combination of the trauma-related, person-level, and environmental factors that may affect adaptation following trauma exposure. First, trauma-specific characteristics include frequency, type, and interpersonal nature of the trauma, while the continuum also considers person-level variables (e.g., nervous system hyperactivity, co-occurring psychological disorders of mood and personality, and substance abuse) and environmental risk factors (e.g., lack of social support, lower socioeconomic status, stigmatization associated with the trauma) that empirical studies have found to moderate the impact of trauma exposure.

Phenomenology of complex posttraumatic states. Rather than trying to define a single syndrome to capture the complex range of psychological distress resulting from complex trauma, Briere and Spinazzola (2005) propose domains of disruption observed among individuals with "high complexity" posttraumatic reactions (see Figure 1). While the authors acknowledge that these individuals are likely to have suffered the victimization and disruptions described by Herman as complex trauma and the DSM-IV Task force as DESNOS, Briere and Spinazzola dispute that a single syndrome or label can capture the complex responses to multiple, chronic, interpersonal traumatic stressors. Consequently, the authors call for a dimensional conceptualization of posttraumatic states and suggest a framework for domains of disruption to assess and treat in cases of complex trauma.

Cumulative traumatic stress symptom complexity. In considering the empirical study of complex posttraumatic stress, researchers have proposed a different approach to conceptualizing and measuring complex posttraumatic responses. Consequently, researchers have evaluated complex traumatic stress phenomena by examining whether more frequent trauma leads to more clinical symptom complexity (Briere et al., 2008; Cloitre et al., 2009). Both of these recent studies examined the relation between cumulative trauma exposure, types and timing of the PTE, and psychological symptom complexity measured by the number of clinical level symptoms on the Trauma Symptom Inventory (TSI; Briere, 1995). This construct of *symptom complexity* offers a new conceptualization of complex traumatic stress responses that is not restricted to inclusion or exclusion based on a specific Complex PTSD syndrome or diagnosis.

Figure 1

"Complexity Continuum" of Traumatic Stressors Adapted from Briere & Spinazzola (2005)

LOW Complexity	HIGH Complexity
Single occurrence	*Multiple, recurrent stressors*
Adult-onset	*Early, childhood onset*
Not interpersonal violence	*Interpersonal victimization*
No comorbid disorders	*Physically invasive stressor*
Normoreactive nervous system	*Involving stigma or shame*
Adequate childhood development	*Stress vulnerability of victim*
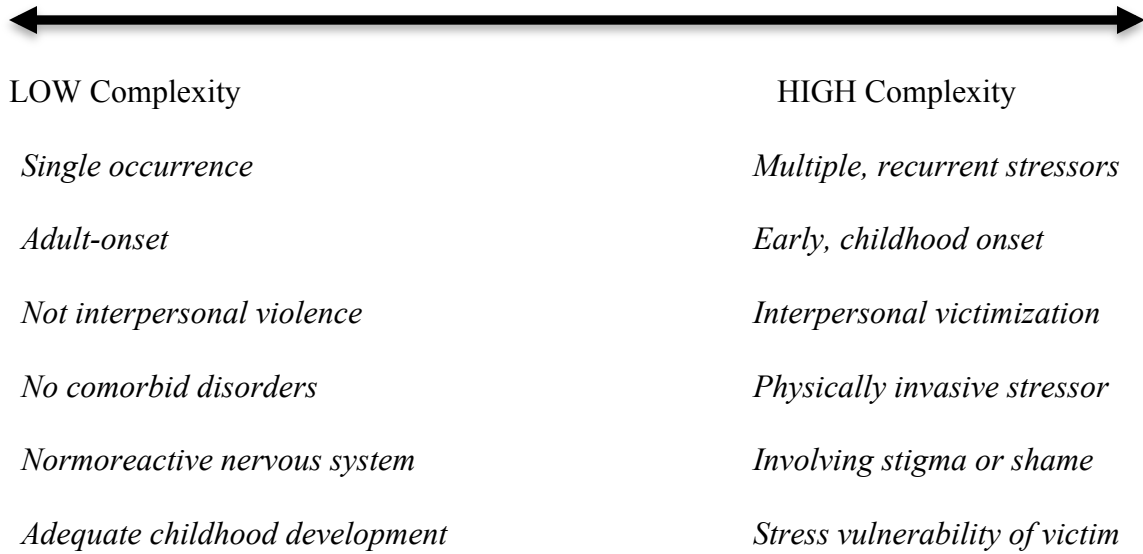
Adverse childhood experiences and cumulative traumatic stress. The direct relation between childhood complex trauma and adulthood complex traumatic stress symptoms has been supported empirically, but researchers have not yet examined prospective, longitudinal data in order to establish causality (see Resick et al., 2012). Nevertheless, research on specific types of complex trauma of childhood, including childhood sexual abuse and physical abuse in particular, provides evidence of a variety of specific contextual factors that impact the relationship between childhood trauma and adulthood psychological distress.

In a review of the literature, Briere and Jordan (2009) identify several empirically supported variables found to impact the trajectory from childhood adverse experiences and adulthood psychological outcomes. Specifically, research of the relation between childhood maltreatment and adult psychological functioning indicates several trauma-specific characteristics found to impact the strength of the relation including: (a) age of the child at onset of the maltreatment, (b) intrafamilial versus extrafmilial abuse, (c) frequency and/or duration of the trauma, (d) penetration in sexual abuse, and (e) bodily injury in physical abuse. Additional adverse childhood experiences demonstrated to impact adulthood psychological outcomes include parental psychopathology and/or substance abuse, childhood exposure to domestic violence, dysfunctional family system characterized by emotional neglect and rigid, authoritarian parenting, and disrupted attachment. The authors note the difficulty facing researchers seeking to disentangle the cumulative impact of these adverse childhood experiences, characteristics specific to the complex trauma history, and other social and environmental risk factors, and encourage them to consider intervening variables in research designs and models.

Purpose of Study

        This study examined the prevalence of complex trauma and traumatic stress symptoms among adult women seeking treatment for substance abuse. Although only a few recent studies have explicitly sought to measure *complex posttraumatic stress* or *Complex PTSD* among this population, there is longstanding evidence that women seeking substance abuse treatment are more likely to have been a victim of interpersonal trauma, including childhood sexual abuse, at rates that far exceed the general population (e.g., Chilcoat & Menard, 2003). Furthermore, symptoms of complex posttraumatic stress reactions, such as dissociation and emotional dysregulation, have been documented among women in substance abuse treatment (e.g., Ford & Smith, 2008) and cited as possible barriers to treatment retention and response (Hien, Cohen, & Campbell, 2005).

        Traumatic stress symptomatology will be examined in two ways: (a) specific symptom domains of simple and complex traumatic stress, and (b) total symptom complexity (e.g., Briere et al., 2008; Cloitre et al., 2009). First, symptom profiles of simple and complex traumatic stress will be explored among women entering substance abuse treatment. Symptom domains for simple posttraumatic stress will include the DSM-IV-TR criteria of re-experiencing, defensive avoidance or numbing, and anxious hyperarousal. This study draws on a model of complex traumatic stress using the terminology proposed by the ITSTSS Complex Trauma Task Force (Cloitre et al., 2011) and will examine symptoms of three domains: (a) emotion regulation difficulties, (b) disturbances in relational capacities, and (c) alterations in attention and consciousness. Two domains of complex traumatic stress,

adversely affected belief systems and somatic distress or disorganization, were not assessed in this archival study.

In addition, cumulative traumatic stress symptoms will be operationally defined as trauma-related symptom complexity. In accordance with the methods reported by two distinct research teams (i.e., Briere et al., 2008; Cloitre et al., 2009), this construct will provide a count of the number of clinically significant symptoms of simple and complex traumatic stress that women exhibit at entry to substance abuse treatment. Furthermore, this study will consider the developmental perspective of complex, cumulative trauma by considering adverse childhood experiences, including interpersonal victimization, known to impact the severity of disruption of emotional regulation and self-capacities.

Thus, using archival data collected for the purpose of program evaluation, this study will use a quasi-experimental research design to explore the traumatic stress symptomatology, complex trauma history, and treatment outcomes of adult women enrolled in trauma-informed substance abuse treatment programs.

Research Questions and Hypotheses

This study addresses three general research questions:

Question 1. Do women entering treatment for substance abuse exhibit distinct profiles of simple and/or complex traumatic stress symptomatology?

Hypothesis 1.1. It is hypothesized that a typology of traumatic stress symptom profiles will emerge that includes the following subgroups: (a) *No Traumatic Stress* cluster characterized by low scores on measures of symptom complexity, Simple or Complex PTS symptoms; (b) *Posttraumatic Stress* cluster characterized by moderate symptom complexity,

elevated scores on Simple PTSD symptom domains, but subclinical scores on Complex

PTSD symptoms; and (c) *Complex/Cumulative Traumatic Stress* cluster characterized by

high symptom complexity scores, as well as elevated scores on both Simple and Complex

PTS symptom domains.

Question 2. What is the relation between substance-abusing women's cumulative

trauma history and traumatic stress symptomatology? Drawing upon Briere and Spinazzola's

(2005) empirically derived continuum of traumatic stressor complexity (see Figure 1) and the

findings of the Adverse Childhood Experiences study (e.g., Anda et al., 2005), is there

evidence that complex, cumulative interpersonal trauma relates to women's complexity of

trauma symptoms in adulthood.

Hypothesis 2.1. The prevalence of lifetime interpersonal trauma will differ by

traumatic stress symptom profile. Specifically, it is predicted that a larger proportion of

women in the Cumulative/Complex Traumatic Stress (CPTS) group will report lifetime

sexual and physical abuse, while the No Traumatic Stress cluster will have the lowest

prevalence of interpersonal trauma.

Hypothesis 2.2. Traumatic Stress Symptom Clusters will differ in the prevalence of

developmental complex trauma. Specifically, it is hypothesized that recurrent, childhood

interpersonal victimization will be greatest among the women exhibiting symptoms of

complex traumatic stress.

Hypothesis 2.3. It is predicted that women exhibiting complex traumatic stress

symptomatology will report more adverse childhood experiences than other symptom profile

groups.

Question 3. Do rates of successful completion of trauma-informed substance abuse treatment differ by traumatic stress symptomatology?

Hypothesis 3.1. Traumatic Stress Symptom Clusters will differ in rates of program completion for women in gender-specific, residential treatment programs. Specifically, it is hypothesized that women exhibiting complex traumatic stress symptomatology will be more likely to be unsuccessful discharged.

Hypothesis 3.2. Traumatic Stress Symptom Clusters will differ in rates of program completion for women in a drug court. Specifically, its hypothesized that women exhibiting complex traumatic stress symptomatology will be more likely to be unsuccessful discharged.

Literature Review

Posttraumatic Stress Symptomatology

It is important to consider the history of posttraumatic stress and trauma psychology within the social and political contexts of its diagnostic genesis. Throughout American history, there is documentation of attempts to label posttraumatic responses to war—*soldier's heart* following the Civil War, *shell shock* after World War I, *physioneurosis* and *combat fatigue* after World War II (Chu, 2011, p. 5). The first and second editions of the Diagnostic and Statistical Manual included descriptions of the behavioral and emotional reactions to severe fear or stress, but no trauma-specific diagnostic criteria. During the 1970s, American discontent with the Vietnam War created a climate in which returning veterans were reluctant to share their experiences or wear their uniforms in public. Nevertheless, eventually professions and the public came to recognition of the enduring effects of war on the welfare of this cohort of veterans.

The diagnosis of Posttraumatic Stress Disorder (PTSD) was introduced in the third edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-III; American Psychiatric Association, 1980). Therefore, the official history of PTSD and trauma psychology is relatively brief despite over a century of discourse about posttraumatic stress and states. Since the advent of the diagnostic construct in DSM-III, PTSD has received extensive attention in clinical and research contexts.

Complex Traumatic Stress Psychology

The formal recognition of the diagnosis of PTSD was a monumental step forward for trauma psychology. Many clinicians and researchers, however, found that the diagnostic

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criteria did not capture the complexity of problems for some traumatized populations, especially survivors of childhood maltreatment or interpersonal violence (Briere & Jordan, 2009; Courtois, 2004; Herman, 1992a; van der Kolk et al., 2005). The diagnostic construct of complex trauma and complex posttraumatic stress disorder was proposed by Herman (1992b) to describe the psychological trauma afflicting survivors of chronic, interpersonal abuse survivors. First, she noted that these victims present a complicated and tenacious clinical symptom picture, most commonly including somatization, dissociation, and impaired affect and impulse regulation. Second, they display characteristic personality changes, including relational difficulties and disturbances of identity. Third, they are vulnerable to repeated harm, either self-inflicted or perpetrated by others, including increased likelihood of revictimization (see Classen, Palesh, and Aggarwal [2005] for review).

While the specific nomenclature and symptom constellation remain in question, many support the notion of distinct complexity of symptomatology among survivors of recurrent childhood trauma or maltreatment. Some authors suggest that CPTSD is actually more similar to personality disorders than Simple PTSD, but also distinguish complex trauma from personality disorders by virtue of emanating from a traumatic stressor (Cloitre, Koenen, Cohen, & Han, 2002).

Research confirms the complex psychological symptom presentation of survivors of interpersonal victimization (e.g., sexual abuse/rape, physical abuse). Studies find these trauma survivors meet criteria for many other diagnoses besides PTSD including mood disorders (Breslau, 2008), other anxiety disorders (Zlotnick et al., 2008), eating disorders (de Groot & Rodin, 1999), dissociation (Chu & Dill, 1990), somatization and conversion disorders (Roelofs, Keijsers, Hoogduin, Näring, & Moene, 2002), and personality disorders

(e.g., Ogata, Silk, & Goodrich, 1990). Although often described as comorbid conditions, the evidence of frequent concurrent diagnoses of PTSD and other psychological disorders may reflect an error in our categorization and measurement of posttraumatic responses.

Empirical studies of Complex PTSD & DESNOS. The DSM-IV field trial was the first empirical examination of the construct of Complex PTSD/DESNOS (van der Kolk et al., 2005). Conducted from 1990 to 1992, the field trial investigated correct definition of Criterion A of the DSM PTSD diagnosis, placed symptoms of PTSD into proper clusters of posttraumatic disruption, and explored whether victims of chronic interpersonal trauma as a group presented with Simple PTSD and/or additional constellations of symptoms (Kilpatrick et al., 1998; Pelcovitz et al., 1997).   The PTSD Field Trial sample included both clinical (*N* = 395) and community (*N* = 128) participants screened for exposure to high magnitude traumatic stressors. Participants completed a measure of trauma history (i.e., Potential Stressor Events Interview) and three diagnostic interviews: the posttraumatic stress module of the Structured Clinical Interview for DSM-III-R (SCID), the Diagnostic Interview Schedule (DIS), and the Structured Interview for Disorders of Extreme Stress. The SCID posttraumatic stress module and a modified implementation of the DIS were used to confirm PTSD diagnosis as defined by the DSM-III-R.

One study using DSM-IV-TR Field Trial data examined the relation between type and chronicity of interpersonal trauma, and diagnostic symptom presentation (van der Kolk et al., 2005). A total of 234 participants were included in the sample; the majority were adult, White women. Overall, 72% of participants who met criteria for Simple PTSD, also met criteria for Complex PTSD. Analysis of posttraumatic stress diagnoses across types of interpersonal abuse (sexual, physical, both sexual and physical) revealed that sexual abuse,

with or without physical abuse experiences, was significantly more likely to result in co-occurring Simple PTSD and Complex PTSD (74% of sexual and physical abuse group; 53% of sexually abuse only group). Further, 75% of the sample met criteria for PTSD, 41% met criteria for co-occurring PTSD and CPTSD; however, only 4% – 6% of the field trial sample exhibited Complex PTSD in absence of a Simple PTSD diagnosis.

Moreover, studies conducted by the PTSD task force during the DSM-IV-TR field trials suggested the development of DESNOS was associated with experiencing early interpersonal trauma, younger age of trauma onset, and longer exposure to traumatic events (van der Kolk et al., 2005). These symptoms were found to occur in addition to Simple PTSD and were more strongly associated with sexual abuse. Studies with civilian (Ford et al., 2006; Ford & Smith, 2008; McLean & Gallop, 2003; Pelkovitz et al., 1997; Roth et al., 1997; van der Kolk et al., 2005) and military (Ford, 1999) samples also indicated that DESNOS is most likely to occur when complex trauma occurs earlier in childhood and involves interpersonal violence.

A study by Zlotnick and colleagues (1996) examined symptoms of DESNOS in 108 women consecutively admitted to a psychiatric hospital. Among the sample, 68% reported a history of childhood sexual abuse. Participants completed validated measures of psychological symptoms that corresponded to criteria of DESNOS (e.g., somatization, dissociation, affect dysregulation, relationship problems, identity changes, repetition of self-harm). Women reporting sexual abuse experiences and the comparison group (i.e., no sexual abuse) did not differ on demographic variables. Analysis of DESNOS domains indicated that women reporting a history of sexual abuse scored significantly higher on all criteria except depression as measured by a subscale of the SCL-90-R. Comparison of the proportion of

each group scoring above the clinical cutoff indicated more than 70% of sexually abused women exceeded the clinical level for all measures of DESNOS symptoms, whereas the comparison group generally hovered around 50% at the clinical cutoff with the exception of social adjustment problems (75%) and depression (93%). This study provided further evidence that Complex PTSD symptomatology might be strongly related to experiences of childhood sexual victimization and the constellation of clinical psychopathology that could develop goes beyond Simple PTSD.

Cluster analytic studies of Complex PTSD. In addition, cluster analytic research using measures of psychological symptomatology suggests that there could be multiple subtypes of Complex PTSD. For instance, a study of an inpatient psychiatric sample of 227 traumatized women examined the relation between measures of psychopathology and trauma history (Allen, Huntoon, & Evans, 1999). The final cluster solution chosen by the authors identified five symptom typologies among survivors of interpersonal trauma: (a) alienated, (b) withdrawn, (c) aggressive, (d) suffering, and (e) adaptive. Each cluster was associated with particular symptom presentation and related diagnostic categories.

Similarly, a cluster analytic study of female sexual assault survivors with chronic PTSD indicated support for three types of traumatic stress subtypes: Simple PTSD, internalizing Complex PTSD, and externalizing Complex PTSD (Miller & Resick, 2007). The authors stated that the externalizing group was characterized by symptoms of behavioral impulsivity and disinhibition, substance dependence, and cluster B personality disorder features, whereas the internalizing group was associated with low positive temperament, high rates of major depressive disorder, and elevations on measures of schizoid and avoidant personality disorder. This study replicated previous findings of internalizing and

externalizing symptomatology clusters among veterans with PTSD (Miller, Greif, & Smith, 2003; Miller, Kaloupek, Dillon, & Keane, 2004).

Taken together, these cluster analytic studies illuminated the heterogeneous presentation of individuals with complex PTSD but suggested differences in clinical symptomatology that might reflect different treatment needs.

Studies of cumulative trauma symptom complexity. In considering empirical study of complex posttraumatic stress, Briere, Kaltman, and Green (2008) proposed a different approach to conceptualizing and measuring complex posttraumatic responses. Noting the lack of empirical research of effects of cumulative trauma, the authors conducted a study that explored the relation between the number of potentially traumatic experiences, the type of traumas, and the symptom complexity, defined as the number and type of clinical-level symptoms exhibited. Their sample included 2,453 female university students in greater Washington, DC. The results indicated a linear relation between number of trauma types in childhood and current symptom complexity as measured by the number of clinically elevated subscales on the *Trauma Symptom Inventory* (TSI; Briere, 1995). Consequently, the authors suggested this study offered a new conceptualization of complex posttraumatic stress responses that is not restricted to particular posttraumatic symptoms to define a *Complex PTSD* syndrome.

Similarly, Cloitre et al. (2009) examined the relation between childhood and adulthood cumulative trauma, types of trauma, and trauma symptom complexity using archival data from a clinical treatment sample of adults ($N = 582$). The authors operationalized symptom complexity as the number of clinically elevated subscales on six measures of clinical symptoms nested within three domains of complex traumatic stress: (a)

PTSD symptoms, (b) emotion regulation difficulties, and (c) interpersonal problems. Symptom complexity scores ranged from 0 to 6 clinical level symptom scores, out of a possible six symptoms of complex posttraumatic stress. Results from the study of adults revealed that childhood cumulative trauma was significantly related to symptom complexity, but the relation between adult symptom complexity and adult cumulative trauma was non-significant.

Trauma, PTSD, and Co-occurring Substance Abuse

Studies in both the general population and in trauma-exposed samples repeatedly find high prevalence rates of PTSD in subjects with substance use disorders (SUD; Becker et al., 2005; Breslau et al., 2008; Chilcoat & Menard, 2003; Kessler et al., 1995; McHugo et al., 2005; Najavits et al., 1997). As many as 90% of adult SUD patients report a history of psychological trauma and 33-50% of SUD clients meet criteria for PTSD (Hien, Cohen, & Campbell, 2005). In a study of women dually diagnosed with a substance use and mental health disorder, 85% reported physical abuse by a known person, 71% reported that they had been stalked or threatened, 73% reported having been raped, and 67% reported other unwanted sexual contact over the course of their lifetime (McHugo et al., 2005). Adults with SUD are 11 times more likely to have PTSD that non-SUD adults, while adults with PTSD are four to five times more likely to have a SUD than adults without PTSD (Chilcoat & Menard, 2003).

Despite the high frequency of their co-occurrence, however, traditionally substance abuse and mental health concerns have been addressed separately, often sequentially, or at least via different treatment providers. While in-depth exploration of trauma requires professional intervention by those with expertise, the need to provide some intercession for

trauma-related symptoms within substance abuse treatment programs is supported by studies which find that when this does not occur participants with a history of trauma are more likely to have negative treatment outcomes (e.g., Jaycox, Ebener, Damesek, & Becker, 2004; Sacks, McKendrick, & Banks, 2008) and cost more to treat than clients without PTSD symptoms (Jacobson, Southwick, & Kosten, 2001).

In addition, co-occurring PTSD and SUD diagnoses are correlated with poorer treatment recruitment and retention (Brown, Read, & Kahler, 2003) and treatment outcomes (Ouimette, Moos, & Finney, 2003). Failure to address victimization, PTSD, and substance abuse concurrently may interfere with treatment retention and effectiveness and may contribute to relapse for men and women (Cohen & Hien, 2006; Trifflemann, 2000). Even for those who complete treatment, continued experience of trauma-related symptoms may lead to relapse and recidivism, as noted in a follow-up study of over 300 adults who received residential treatment for substance abuse. After leaving treatment, those who reported higher levels of anxiety and depression at follow-up were also more likely to report relapse (Gil-Rivas, Prause, & Grella, 2009). Thus, it is important to incorporate interventions for trauma and trauma-related symptoms within substance abuse treatment programs to improve outcomes for clients who have had these experiences.

Empirical studies of trauma-informed treatment. Recent empirical studies have focused on the use of trauma-informed assessment and interventions for women receiving substance abuse treatment and provide preliminary support for the effectiveness of trauma-related interventions for improving substance use and psychological functioning (McHugo et al., 2005; Morrissey et al., 2005; Najivitz, 2009). A growing body of research suggests that substance abuse treatment programs that provide trauma-informed interventions result in

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better outcomes than do programs that provide substance abuse treatment alone (Amaro, Chernoff et al., 2007; Amaro, Dai et al., 2007; Clark & Young, 2009; Farley, Golding, Young, Mulligan, & Minkoff, 2004).

For instance, a study of women in residential treatment who also received enhanced, trauma-informed interventions were more likely to be retained in treatment for at least four months than women in residential programs who did not receive that type of intervention (Amaro, Chernoff et al., 2007). Similarly, researchers assessed over 1,000 women for 12 months after they entered substance abuse treatment programs as part of the Women, Co-occurring Disorders and Violence Study (Morrisey et al., 2005). The investigators found that those women who received integrated treatment for co-occurring disorders had similar substance abuse outcomes but greater reductions in trauma symptoms relative to those who did not have those specialized interventions. An analysis of data on several thousand clients collected as part of the National Treatment Improvement Evaluation Study (Marsh, Cao, & D'Aunno, 2004) found that both men and women showed significant improvements in drug and alcohol use when provided with comprehensive treatment (including mental health services). Taken together, the research findings suggest that integrated trauma-informed substance abuse treatment appears to be a promising practice to address the treatment needs of traumatized clients entering substance abuse treatment.

Co-occurring Complex Traumatic Stress and Substance Abuse

Building upon the work of the PTSD task force during the DSM-IV field trials, Ford and Smith (2008) examined the prevalence of Simple and complex PTSD symptoms of men and women in outpatient addictions treatment. The authors found that 75% of the sample met criteria for Simple PTSD, 41% met criteria for co-occurring PTSD and CPTSD, while

only 4% exhibited solely CPTSD. Notably, within the PTSD group many met some, but not all, criteria for complex PTSD including difficulty with interpersonal trust (97%), pathological dissociation (87%), emotional dysregulation (87%), and perceiving the self as "damaged" (87%). In addition, the co-occurrence of Simple PTSD and CPTSD was associated with the history of childhood sexual trauma, adulthood sexual revictimization, and more severe PTSD and depression symptoms.

Recently, researchers have examined Complex PTSD symptoms in relation to substance abuse treatment and outcomes. Cohen and Hien (2006) examined the impact of cognitive-behavioral therapy (CBT) on problems associated with complex trauma and substance use for 107 women. This study assigned women to either of two CBT intervention conditions (i.e., relapse prevention and Seeking Safety) as part of a clinical trial and assessed severity of substance use and trauma symptoms at various points of treatment. Utilizing Herman's constructs, the authors used a variety of assessments to capture each potential domain of impairment in of Complex PTSD. Comparison of baseline scores to 3-months post-baseline indicated significant reductions in PTSD and alcohol use disorder symptoms regardless of intervention condition. Measures of depression, dissociation, social problems, and sexual functioning did not improve over time in treatment. The authors posit that the treatment resistant symptoms are consistent with complex posttraumatic stress and might require more intensive or different intervention than co-occurring Simple PTSD and SUD.

A randomized control study of two addiction treatments included a measure of complex posttraumatic stress disorder (CPTSD) in addition to typical measures of psychological distress and substance use severity (Ford, Hawke, Alessi, Ledgerwood, & Petry, 2007). Adult outpatients being treated for cocaine or opioid dependence were

randomly assigned to standard treatment or contingency management treatment ($N = 142$). The authors found that treatment outcome was mediated by complex PTSD symptom level at intake, and that complex PTSD predicted all outcomes over and above a commonly utilized measure of psychological distress. Interestingly, higher levels of PTSD symptoms at baseline were the strongest protector of achieving abstinence at nine-month follow-up.

Conclusions

The past few decades of research have supported the frequent occurrence of substance abuse and potentially traumatic experiences. Studies of women seeking substance abuse treatment estimate that as many as 80% to 90% may have a lifetime history of sexual assault, physical assault, or both (i.e., interpersonal abuse; Cohen & Hien, 2006; Ford & Smith, 2008). Moreover, studies have shown that 30% to 59% of substance abusing women meet criteria for Simple PTSD. Nevertheless, only recently have empirical inquiries been made about the likelihood that many SUD women may meet criteria for complex posttraumatic stress disorder or DESNOS.

Herman (1992b) and the PTSD task force called for a paradigm shift to differentiate the experiences and psychological distress of those who have endured ongoing physical and sexual assault perpetrated by another human being. Further research is needed to better understand the construct of complex posttraumatic stress responses and its relation to Simple PTSD, mood disorders, personality disorders, and substance use disorders, as well as to examine implications for treatment. While some view complex trauma as relating to only the most extreme cases, there is significant evidence that the majority of patients seeking mental health and substance abuse services have endured multiple potentially traumatic experiences, and many include childhood maltreatment (Chu, 2011). Empirical evidence suggests that the

treatment needs of patients reporting symptoms of Complex PTSD differ from Simple PTSD

(see Resick et al., 2012). In fact, some experts found that effective treatments for Simple

PTSD, such as prolonged exposure or cognitive restructuring may actually cause harm for

patients exhibiting symptoms of complex PTSD if adequate coping skills and an

interpersonal alliance have not been established prior to trauma-specific psychotherapy

(Courtois, 2004).

Chapter III

Method

This study used archival data drawn from three trauma-informed substance abuse treatment programs in Santa Barbara County. All data were collected as part of an evaluation process for each of the three treatment programs. A quasi-experimental research design was used investigate this study's research questions and hypotheses.

Participants

This study examined archival data collected on 360 adult women enrolled in trauma-informed substance abuse treatment programs funded through grants provided by the Substance Abuse and Mental Health Services Administration (SAMHSA) between October 2004 and March 2012. Participants were selected into this study's dataset if they obtained valid scores on a norm-referenced assessment of trauma-related symptoms at intake to treatment. All participants resided in central California, and exhibited a significant substance use problem at entry to the treatment program.

Examination of demographic information indicated that the majority of the participants were either White or Latina and the average age of participants at intake to treatment was 29 years. Table 1 details the ethnicity and age groups frequencies for each program and the overall sample.   Comparison of mean age between programs indicated differences in women's age at intake to treatment, $F (2, 358) = 10.48$, $p < .001$. Post-hoc pairwise comparisons revealed that women enrolled in Program A ($M = 26.9$; $SD = 6.6$) were significantly younger on average than women in Program B ($M = 29.8$; $SD = 7.5$) or Program C ($M = 30.9$; $SD = 9.1$).

Table 1

Women's Demographic Characteristics

Program	RTP-A ($n = 139$)	RTP-B ($n = 102$)	DCP ($n = 119$)	TOTAL ($N = 360$)
Ethnicity				
Latina	53%	33%	45%	45%
White	42%	62%	47%	48%
Other	5%	5%	8%	7%
Age (years)				
18 – 21	23%	11%	17%	18%
22 - 25	32%	26%	18%	25%
26 - 35	32%	39%	33%	34%
35 – 45	12%	23%	23%	18%
46 – 55	1%	2%	10%	4%

Note. RTP-A = Residential Treatment Program A; RTP-B = Residential Treatment Program B; DCP = Drug Court Program.

Program

Descriptions of the specific programs included in this study are provided for *Residential Treatment Program A*, *Residential Treatment Program B,* and an *Enhanced Drug Court Treatment Program.*

Residential Treatment Program A (RTP-A). This grant-funded trauma-informed treatment program operated from January 1, 2005 and March 31, 2009. The RTP-A program was designed for women with substance abuse problems and their young children. It provided six months of residential treatment followed by outpatient treatment. While living at the residential center for a six-month intensive treatment phase, women received screening and assessment, case management, referral for psychiatric services, individual and group counseling for alcohol and drug problems, trauma-informed group counseling, parent education, childcare services, vocational training, transportation, and drug testing. Mothers that were under the age of 18 years or that are deemed to pose a significant risk of violence to others were excluded from the program.

Residential Treatment Program B (RTP-B). This grant-funded trauma-informed treatment program was an implementation of a multisite study operated between January 1, 2009 and March 31, 2012. The RTP-B program provided residential treatment to pregnant, postpartum, or parenting women with substance abuse problems and their children. While living at the residential center for a six-month intensive treatment phase, women received screening and assessment, case management, referral for psychiatric services, individual and group counseling for alcohol and drug problems, trauma-informed group counseling, parent education, childcare services, vocational training, transportation, and drug testing. Children received screenings and assessment, therapeutic interventions, pediatric health care, social

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services and financial supports, educational and recreational services, family therapy, and referral resources. Mothers who were under the age of 18 years or who were deemed to pose a significant risk of violence to others were excluded from the program.

Enhanced Drug Court Program. This grant-funded program operated between January 1, 2009 and March 31, 2012 and provided trauma-informed enhancements to treatment received by adult men and women in a drug court. In the drug court of study, adults charged with a drug related misdemeanor or felony and who demonstrated a need for substance abuse treatment were eligible. Offenders were *in*eligible if they were charged with a violent crime, the distribution of drugs, or a sex crime. In accordance with the key component guidelines established by the National Association of Drug Court Professionals (1997), the drug court model used a non-adversarial approach toward offenders, frequent drug and alcohol testing, use of graded incentives and sanctions in response to compliance with treatment, and ongoing judicial involvement. Participants received screening and assessment, case management, referral for psychiatric services, individual and group counseling for alcohol and drug problems, trauma-informed group counseling, vocational assessment and training, and receive frequent drug testing. The enhanced drug court program was approximately 12- to 18-months long with treatment graded in intensity over time.

Trauma-informed treatments. In establishing a trauma-informed system of care, local mental health administrators disseminated information and training to support implementation of evidenced-based treatments for both substance abuse and co-occurring PTSD symptoms. All participants in this study received specific evidence-based interventions for substance abuse (i.e., Matrix Model; Rawson et al., 1995, 2005) and

trauma-informed treatment of co-occurring SUD and posttraumatic stress (i.e., Seeking Safety; Najavits, 2002) as part of their respective programs.

Matrix Model. Clients in all three grant programs received evidenced-based interventions for substance abuse based upon adaptations to the Matrix Model of substance abuse treatment (Rawson et al., 1995, 2005). The Matrix Model is a manualized program that integrates cognitive behavioral therapy, contingency management, motivational interviewing, 12-step facilitation, and family involvement. The Matrix has been researched for over 25 years, and is considered an evidence-based practice by SAMHSA for reduction of alcohol and drug use, including methamphetamines.

Seeking Safety. In addition, clients received weekly, trauma-informed group interventions through Seeking Safety (Najavits, 2002). Seeking Safety is a cognitive-behavioral treatment program designed to support abstinence and reduce self-destructive behaviors by building coping skills for adults with substance abuse problems who also have a history of trauma. The program helps clients understand the co-occurrence of substance abuse and trauma and the impact both have on their functioning. Viewing substance abuse as an attempt to cope with the pain of trauma is facilitated as participants are taught coping skills that apply to both problems. Seeking Safety has 24 modules; each group is structured to provide group interaction and discussion but with a focus on current behavior; depth discussions of personal trauma is relegated to individual sessions with trained therapists when needed. Studies of this intervention have yielded promising results with regard to reductions of trauma symptoms as well as substance use. For example, in a study by Gatz and colleagues (2007) women receiving Seeking Safety as part of their substance abuse treatment showed significantly better treatment retention over three months and greater

improvement on posttraumatic stress symptoms and coping skills compared to women without the Seeking Safety groups. Similarly, Desai, Harpaz-Rotem, Najavits, and Rosenheck (2008) reported that women who received Seeking Safety experienced less psychiatric distress and fewer PTSD symptoms over the course of the following year than did women in treatment who did not receive this intervention.

Measures

A variety of self-report measures were utilized to collect information about the characteristics, trauma history, and trauma-related symptoms of participants. The *Trauma Symptom Inventory* was used to evaluate women's trauma symptoms across a range of symptoms of simple and complex traumatic stress. The *Government Performance and Results Act Tool* collected information about treatment completion status, treatment services received, as well as to collect basic demographic information. Additional information about women's interpersonal trauma history will be used from the *Addiction Severity Index* at intake to treatment and a *Consumer Survey*. For women participating in the two most recent grant programs, RTP-B and the Drug Court Program, the *Adverse Childhood Experiences Scale* will be to assess the experience of potentially traumatic events in childhood.

Trauma Symptom Inventory (TSI; Briere, 1995). The *Trauma Symptom Inventory* is a 100-item self-report measure developed to assess symptoms commonly associated with posttraumatic stress. The items fit on 10 subscales, which form three summary clinical scales: (a) the Trauma Summary Scale, comprised of the Intrusive Experiences, Defensive Avoidance, Dissociation, and Impaired Self-Reference sub-scales; (b) the Self Summary Scale, comprised of the Impaired Self-Reference, Sexual Concerns, Dysfunctional Sexual Behavior, Tension-Reduction Behavior and Anger/Irritability subscales; and (c) the

Dysphoria Summary Scale, comprised of the Anger/Irritability, Anxious Arousal, and Depression subscales. All item-responses use a four-point scale ranging from 0 (*never*) to 3 (*often*) and are answered based on the frequency of occurrence of the symptom over the prior six months. Two types of scores, *T*-scores and clinical scores, are obtained. *T*-scores reflect the level of distress indicated by respondents; respondents with a *T*-score of 65 or higher were identified as scoring in the clinical range while respondents with T-scores less than 65 had subclinical levels of distress. The three validity scales—Response Level, Inconsistent Response, and Atypical Response—measure exaggerated, inconsistent, or unusual responding, respectively.

The TSI has demonstrated reliability and validity as a measure of trauma-related symptoms in studies on a number of populations, including clinical samples (Briere, Elliott, Harris, & Cotman, 1995), veterans (Snyder, Elhai, North, & Heaney, 2009), trauma-exposed community residents (McDevitt-Murphy, Weathers, & Adkins, 2005), and university women (Runtz & Roche, 1999). Results of readability analyses indicate that a fifth- to seventh-grade reading ability is required to complete the TSI. The 10 clinical scales of the TSI are internally consistent (mean alphas of .86, .87, .84, and .84 in standardization, clinical, university, and military samples, respectively), and exhibit reasonable convergent, predictive, and incremental validity (Briere, 1995). In a standardization subsample ($N = 449$), TSI scales predicted PTSD *positive* or *negative* status in over 90% of cases. Similarly, in a psychiatric inpatient sample, TSI scales identified 89% of those independently diagnosed with borderline personality disorder. Studies indicate that specific TSI scale elevations are associated with a wide variety of traumatic experiences, including adult interpersonal violence, adult natural

disaster, childhood interpersonal violence, childhood natural disaster, involvement in prostitution, and professionals' exposure to trauma.

Government Performance and Results Act Tool (GPRA). The tool resulting from the Government Performance and Results Act of 1993 (Public Law-103-62) is required of all SAMHSA programs in order to annually set performance targets related to their strategic plan and to annually report the degree to which those targets were met. The GPRA tool has six sections: drug and alcohol use, family and living conditions, education, employment and income, crime and criminal justice status, mental and physical health problems and treatment, and demographics.

Addiction Severity Index (ASI; McLellan et al., 1992). The ASI is a structured interview, designed to evaluate client problems across seven domains: drug use, alcohol use, legal, medical, family/social, employment, and psychiatric status. Composite scores, derived from the client responses, are calculated from each domain. The ASI also contains specific questions assessing prior physical and/or sexual abuse by family members, friends, and/or acquaintances. Specifically, participants are asked separately, "Did any of these people abuse you emotionally… physically… and/or sexually?" This is asked both in reference to the past 30 days and in the participant's lifetime.

Adverse Childhood Experiences Questionnaire (ACE). In order to examine childhood risk factors and potentially traumatic experiences occurring within the family system, the consumer surveys conducted in the RTP-B and Enhanced Drug Court Program included the *Adverse Childhood Experiences* (ACE) scale (Felitti et al., 1998). A copy of the ACE scale is included in Appendix A. The ACE scale was developed as part of a large-scale epidemiologic study of the influences of stressful and traumatic childhood experiences on

health and behavioral outcomes later in life. The initial study was conducted with more than 17,000 clients in a primary care setting. Respondents are asked about their exposure to 10 forms of childhood trauma: (a) physical abuse, (b) emotional abuse, (c) sexual abuse, (d) household substance abuse, (e) incarcerated household member, (f) household mental illness, (g) mother treated violently, (h) emotional neglect, (i) physical neglect, and (j) parental separation or divorce. Scores can range between 0 and 10, with an ACE Score of zero given when a respondent reports no exposure to any type of potentially traumatic event and an ACE Score of 10 reflecting client reported exposure to all of the categories of trauma. In large-scale, retrospective study of patients in primary care, the number of types of traumatic events was associated with greater risk for depression and adult substance abuse (Anda et al., 2002); this has been replicated in subsequent studies (e.g., Dube et al., 2003).

Data Collection Procedures

In all three programs, clients were administered the ASI, TSI, and GPRA at intake to treatment. Due to variability in clients' linguistic and literacy abilities, all assessments were read aloud and the treatment provider recorded most data. Only providers, who received specific training and instruction on the proper administration of the measures, perform data collection. Treatment providers also received periodic trainings to insure the consistency of the integrity of the assessment administration. Moreover, given the psychologically sensitive content of the TSI, providers were instructed to have a same-gender professional administer the questionnaire and clients circled their own responses. Due to frequent elevations on the Atypical Response Scale for dually-diagnosed patients in the normative sample (Briere, 1995), the validity of TSI protocols were evaluated on a case-by-case basis in consultation with treatment providers.

Approximately three months into treatment, members of the research team administered a Consumer Survey. As part of the consumer satisfaction survey for all three programs, participants were asked about whether they had ever experienced sexual and/or physical abuse. If interpersonal abuse was endorsed, several follow-up questions were asked including age when they first experienced the abuse, relationship to the perpetrator (i.e., family member, someone known outside the family, stranger), and recurrence (i.e., single versus multiple episodes). In addition, the consumer surveys for two programs (i.e., RTP-B; Drug Court Program) included the ACE questionnaire (Felitti et al., 1998). Participants were offered a $5.00 gift card for their participation in the consumer interview.

All data were deidentified by the treatment provider and entered into databases by researchers using an anonymous ID number to ensure confidentiality. Data were stored and entered into an onsite computer at by graduate students and trained research assistants, and all paper copies of data are stored in locked file cabinets in locked rooms. UCSB's IRB board approved all research.

Methodological Procedures for Cluster Analysis

Cluster analysis is the umbrella term describing several classification procedures used to identify subgroups within multivariate data sets. It is a multivariate grouping technique that allows for identification of homogenous subgroups (or clusters) within diverse samples based on shared common characteristics or similarities (Allen & Goldstein, 2013). Cluster analysis is described as the "useful division of a sample into a number of groups, where both the number of clusters and their properties are to be determined," (Everitt, Landau, Leese, & Stahl, 2011). As compared to "variable-centered" grouping techniques (e.g., factor analysis),

CA is considered a "person-centered" approach used to identifying groups of people with a constellation of interrelated features (Bergman & Trost, 2006).

Data screening and clustering variable selection. Preliminary data screening determined whether variables of interest were suitable for inclusion in the cluster analysis. In order to reduce the threat of "noisy" variables that could mask the true underlying structure of the sample, only variables of importance were included in this study's cluster analysis model (DiStefano & Mindrila, 2012). Given empirical and theoretical support for trauma-related symptoms captured by the TSI all 10 clinical subscales were considered (Briere, 1995). Unfortunately, the TSI does not assess two symptom domains of complex trauma: (a) altered belief systems and (b) somatization or somatoform distress.

While the statistical assumptions of "cluster analysis" as a methodological group are ill-defined, it is recommended that multivariate assumptions of normality, independence of observations, and threats of multicollinearity are examined for all continuous variables (Cross, 2013). For this study, independence of observations was assumed due to grant contracts requiring nonduplication of participants. Preliminary data screening included examination of histograms, descriptive data, and collinearity diagnostics for women's intake *T*-scores on all clinical subscales of the Trauma Symptom Inventory (TSI; Briere, 1995).

Ward's method. According to Everitt et al. (2011), "The hierarchical methods form the backbone of cluster analysis in practice" (p. 110). Within the social and behavioral sciences, the most popular cluster analytic method is Ward's method of hierarchical agglomeration (Aldenderfer & Blashfield, 1984; Borgen & Barnett, 1987). By mathematical definition, Ward's method creates clusters that minimize the within-group variance at each step

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of the procedure (Rencher & Christensen, 2012; Ward, 1963). Thus, for this study, Ward's method was chosen in order to create groups that minimize the within-group differences.

K-means optimization procedure. One limitation of Ward's method, however, is that once a case is assigned into a particular cluster, it cannot be changed (Everitt et al., 2011). To overcome this drawback, the Ward algorithm was followed by a k-means procedure, a method within the iterative partitioning family. The k-means method requires the researcher to establish the number of clusters a priori and provide representative "seed" data to calculate the centroids of the initial trial of clusters (Borgen & Barnett, 1987). Initially, cases were placed in the cluster with the nearest centroid based on the seed data, and each cluster centroid was recalculated. Next, the "reassignment pass" allowed cases to change cluster assignment if closer to the typical case of another group and the k-means procedure continued until cases did not change their cluster assignment (Aldenderfer & Blashfield, 1984).

In this study, the Ward's method clustering results were used as the starting point for the k-means procedure to obtain the benefits of both clustering algorithms (DiStefano & Mindrila, 2012). Specifically, results from the Ward's analysis were input into SPSS as starting parameters for the k-means classification procedure, including: (a) the number of clusters determined in the Ward solution; (b) centroid "seed" data itemizing the mean scores on each of the TSI subscales per Ward cluster (D. Mindrila, personal communication, January 23, 2014). The k-means procedure determined cluster groups that minimized Trace (W), thereby achieving recommendations for conscientious cluster solution optimization (Everitt et al., 2011).

Cluster solution selection. After evaluating the Ward agglomeration schedule and dendrogram, the final cluster solution was chosen based on the interpretability of the cluster centroids, average silhouette coefficient measure of cohesion, concordance between the solution and traumatic stress theories and research, cluster size and demographic characteristics.

Cluster naming. Following completion of the Ward's method and k-means procedure, cluster centroids for variables included in the analysis were examined for patterns of clinical symptomatology. In addition, clusters' clinical symptomatology were further described using frequency scores on a variable dichotomizing intake scores on TSI subscales as falling in the nonclinical versus clinical range compared to the age-matched normative sample (Briere, 1995). Furthermore, in order to examine "cumulative traumatic stress" (Briere, Kaltman, & Green, 2009), a *Symptom Complexity* variable was created to count the total number of scores falling in the clinical range (i.e., $T \geq 65$) for symptoms of simple and complex traumatic stress measured by the TSI. Descriptive data for *Symptom Complexity* was compared between clusters. Next, a series of chi-squared analyses compared women's demographic data (i.e., age group, SAMHSA program, ethnicity) of the cluster groups. Finally, researchers determined cluster names describing the symptom profiles of each cluster group.

Chapter IV

Results

Question One

The first research question inquired whether adult women entering substance abuse treatment exhibited differing traumatic stress symptom profiles. Specifically, it was hypothesized that a typology of traumatic stress symptom profiles would emerge that included the following subgroups: (a) *No Traumatic Stress* cluster characterized by low scores on measures of symptom complexity, Simple or Complex PTS symptoms; (b) *Posttraumatic Stress* cluster characterized by moderate symptom complexity, elevated scores on Simple PTSD symptom domains, but subclinical scores on Complex PTSD symptoms; and (c) *Complex/Cumulative Traumatic Stress* cluster characterized by high symptom complexity scores, as well as elevated scores on both Simple and Complex PTS symptom domains.

Data Screening and Variable Selection. Preliminary analyses examined suitability of ten clinical subscales of the TSI for inclusion in the cluster analysis. Evaluation of statistical assumptions included examination of histograms, descriptive data, and collinearity diagnostics for women's *T*-scores on the clinical subscales of the TSI at intake to treatment. Results revealed non-normal distributions of scores on the Sexual Concerns[1] (SC) and Dysfunctional Sexual Behavior[2] (DSB) subscales. Visual examination of histograms revealed a floor effect for *T*-scores on both SC and DSB, with the majority of women

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[1] Sexual Concerns subscale (SC): skew = 1.53; kurtosis = 2.14
[2] Dysfunctional Sexual Behavior subscale (DSB): skew = 1.37

obtaining the lowest possible score on these clinical subscales. Descriptive statistics indicated positively skewed distributions, as well as significant kurtosis for the SC subscale. Furthermore, examination of tolerance and VIF scores suggested concerns about multicollinearity between these subscales (i.e., Sexual Concerns, Dysfunctional Behavior) and other subscales that load onto the Self Summary composite scale (i.e., Impaired Self-Reference, Tension Reduction Behaviors). Inclusion of nonnormal variables, or any subsequent data transformations of such variables, may substantially bias a clustering model and mask the true underlying structure of the data (Pastor, 2010). Examination of histograms and collinearity diagnostics for the Self Summary scale *T*-scores did not reveal any threats of bias. Consequently, the Self Summary *T*-Score was used to broadly capture the conceptual complex trauma domain described as Altered Self-Capacities (Briere & Spinazzola, 2005) or Relational Difficulties (Cloitre et al., 2011), but the specific TSI clinical subscales domains (i.e., DSB, SC, ISR) were of interest when comparing characteristics of the derived clusters.

Cluster analysis. Using SPSS Version 22 data analysis software, a hierarchical cluster analysis using Ward's method classified women based upon intake *T*-scores on six clinical subscales (i.e., Anxious Arousal; Intrusive Experiences; Defensive Avoidance; Dissociation; Depression; Anger/Irritability) and one composite scale (i.e., Self-Dysfunction Summary Score) of the TSI (Briere, 1995). Specific parameters of the Ward's method analysis included: (a) squared Euclidian distance as proximity measure; (b) variables assumed standardized due to congruent scale (i.e., *T*-scores); (c) two through six cluster solutions requested. Results from the Ward method cluster solutions were input as "seed" data for a k-means optimization procedure to allow reassignment of women to the nearest cluster centroid.

Cluster solution selection. The agglomeration schedule, dendrogram, cluster centroids, and demographic data were examined for the two through six cluster solutions. Based upon the interpretability of the cluster centroids, sample size within clusters for follow-up analyses, measure of cohesion (average silhouette coefficient = 0.5), and resonance with traumatic stress theories and research, the four-cluster solution was determined to be optimal.

Cluster names and characteristics. The four-cluster solution included the following subgroups of women entering treatment for substance use disorders: (a) No Traumatic Stress (NTS) (b) Defensive Avoidance (DA), (c) Post-Traumatic Stress (PTS), and (d) Complex/Cumulative Post-Traumatic Stress (CPTS). Table 2 and Figure 1 describe the cluster centroids on TSI scales for the four-cluster solution. Comparison of cluster demographic characteristics, detailed in Tables 2 and 3, revealed that cluster groups were similar in age[3], race[4], and treatment program[5].

First, women classified in the NTS cluster had mean and median scores on all symptom domains of traumatic stress falling within one standard deviation below the normative mean (i.e. $40 \leq T \leq 50$). Symptom Complexity scores ($M = 0.01$, $SD = .10$; $Mdn = 0$) provided further evidence of the nonclinical traumatic stress symptom profile of this group of women entering substance abuse treatment.   The NTS cluster represented 26.7% of the entire sample.

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[3] $F(3, 359) = 1.28$, *n.s.*
[4] $\chi^2(6, N = 360) = 5.52$, *n.s*
[5] $\chi^2(6, N = 360) = 8.00$, *n.s* .

Next, the DA cluster had elevated centroid scores for the Defensive Avoidance clinical subscale ($T = 59.48$) and median ($T = 60$) scores falling approximately one standard deviation above the normative mean, and centroids within the average range on all other symptom domains. In addition, scores on Symptom Complexity ($M = 0.68$, $SD = .78$; $Mdn = 1$) indicated women in the DA cluster reported some symptoms of psychological stress that may warrant clinical attention, but did not present with a constellation of symptoms characteristic of either simple or complex traumatic stress. The DA cluster comprised 30.0% of the sample.

The PTS cluster centroids fell one to two standard deviations above the normative mean on all simple posttraumatic stress symptom domains (i.e., Anxious Arousal, Intrusive Experiences, Defensive Avoidance), as well as on the Dissociation and Depression clinical subscales. The PTS cluster's highest mean scores were on the core posttraumatic stress symptom domains of Defensive Avoidance ($T = 68.24$; 75% clinical) and Intrusive Experiences ($T = 66.56$; 54% clinical), followed by the Anxious Arousal ($T = 63.15$; 40% clinical), Dissociation ($T = 62.82$; 44% clinical), and Depression ($T = 61.71$; 41% clinical) subscales. In contrast, centroid scores were in the average range for the Anger/Irritability ($T = 54.52$; 9% clinical) and Self-Dysfunction ($T = 57.83$; 16% clinical) scales. In addition, Symptom Complexity scores ($M = 2.74$, $SD = 1.14$; $Mdn = 3$) suggested the women in the PTS cluster reported a constellation of traumatic stress symptoms. The PTS cluster included 24.2% of the sample of women entering treatment for substance use disorders.

Finally, the CPTS cluster had centroid scores approximately two standard deviations above the normative mean on all seven traumatic stress symptom domains. The CPTS cluster's highest mean scores were on the Dissociation ($T = 73.23$; 88% clinical), Self-

Dysfunction ($T = 71.94$; 78% clinical), Intrusive Experiences ($T = 71.88$; 75% clinical), and

Defensive Avoidance ($T = 70.13$; 84% clinical) trauma symptom domains. Furthermore,

CPTS cluster centroids fell in the clinical range compared to the normative mean for the

Anxious Arousal ($T = 70.13$; 70% clinical), Depression ($T = 69.87$; 87% clinical) and

Anger/Irritability ($T = 68.25$; 67% clinical) subscales. In addition, Symptom Complexity

scores ($M = 5.49$, $SD = 1.27$; $Mdn = 5$) indicated that women in the CPTS cluster reported a

constellation of clinically significant symptoms of complex traumatic stress. The women in

the CPTS cluster comprised 19.2% of the women in the sample.

In summary, results from the exploratory cluster analysis created a typology of

traumatic stress symptomatology reported by adult women entering substance abuse

treatment based upon intake T-scores on seven symptom domains of the TSI. As predicted,

the clusters varied in the types, severity, and clinical complexity of traumatic stress

symptoms reported. Examination of cluster centroids and descriptive data suggested evidence

for all three traumatic stress symptom profiles hypothesized: (a) No Traumatic Stress

subgroup ($n = 96$) characterized by subclinical scores on all trauma symptom domains; (b)

Simple Posttraumatic Stress subgroup ($n = 69$) characterized by clinical-level scores on the

core symptom domains of simple posttraumatic stress but subclinical scores on complex

traumatic stress symptoms; (c) Complex/Cumulative Post-Traumatic Stress subgroup ($n =$

69) characterized by clinical-level scores on all symptom domains of simple and complex

traumatic stress. In addition, the final cluster solution revealed a subgroup of substance

abusing women (i.e., DA, $n = 108$) who had elevated centroid scores on the Defensive

Avoidance clinical subscale without concurrent elevation for other symptoms of simple or

complex traumatic stress.

Table 2

Centroids and Related Descriptive Data for the Four-Cluster Solution

Symptom Domain TSI Scale	NTS *M* (*SD*)	DA *M* (*SD*)	PTS *M* (*SD*)	CPTS *M* (*SD*)
Posttraumatic Stress				
Anxious Arousal	43.92 (5.47)	53.22 (6.06)	**63.15** (6.76)	**67.29** (5.51)
Defensive Avoidance	49.09 (6.42)	**59.48** (6.26)	**68.24** (5.44)	**70.13** (4.86)
Intrusive Experiences	45.91 (5.55)	55.06 (6.80)	**66.56** (7.05)	**71.88** (7.64)
Complex Traumatic Stress				
Dissociation	44.56 (4.86)	54.04 (6.21)	**62.82** (7.39)	**73.23** (8.63)
Depression	46.11 (5.94)	55.59 (7.22)	**61.71** (7.03)	**69.87** (5.47)
Anger/Irritability	44.21 (5.28)	56.10 (7.90)	54.52 (7.74)	**68.25** (7.55)
Self-				
Summary Score	44.87 (3.65)	55.46 (6.54)	57.83 (7.26)	**71.94** (9.27)
Symptom complexity[6]	0.01 (0.10)	0.68 (0.78)	2.75 (1.14)	5.49 (1.28)
Cluster *N*	96	108	87	69
Cluster %	26.6%	30.2%	24.1%	19.1%

Note. Cluster centroids falling approximately one or more standard deviations from the normative mean are emboldened. NTS = No Traumatic Stress Cluster; DA = Defensive Avoidant; PTS = Post-Traumatic Stress; CPTS = Complex Post-Traumatic Stress.

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[6] *Symptom Complexity* was defined as the total count of Trauma Symptom Inventory (TSI) *T*-scores falling at least 1.5 standard deviations above the normative mean for each of the symptom domains included in the cluster analysis (Range: 0 to 7).

Figure 2.

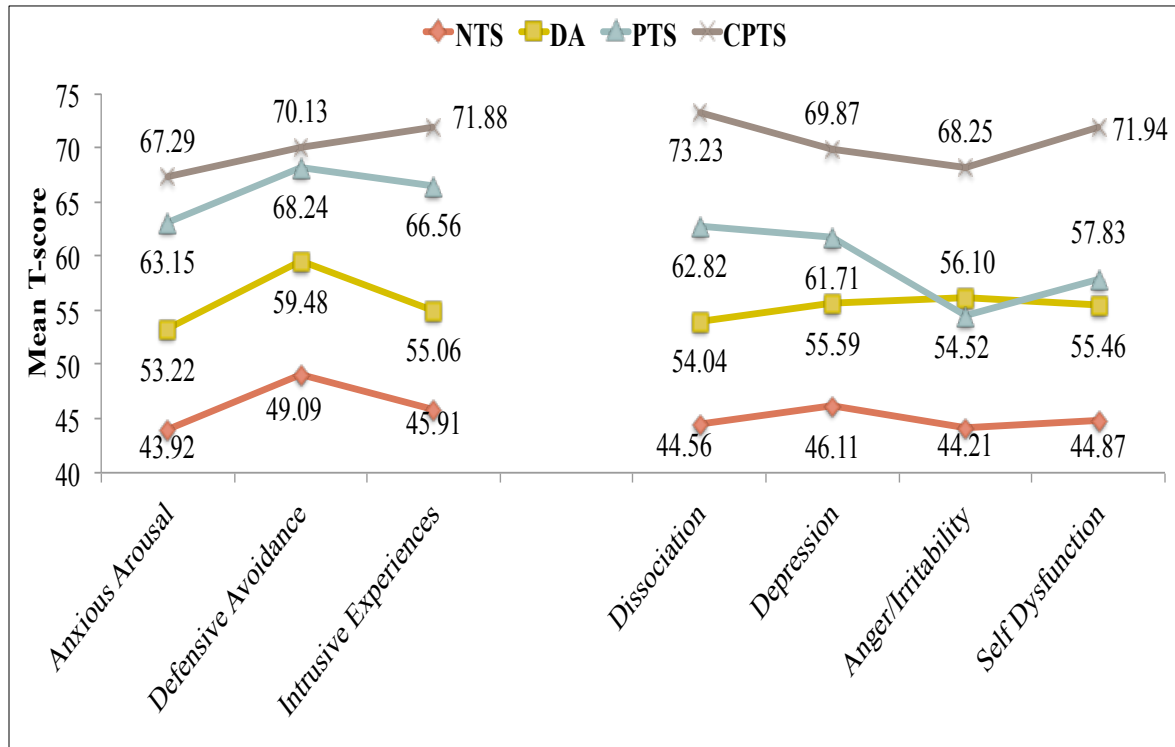*Cluster Centroids on TSI subscales for Final Four-Cluster Solution*

Table 3

Demographic Characteristics of Cluster Groups and Overall Sample

Variable	NTS (*n* = 96)		DA (*n* = 108)		PTS (*n* = 87)		CPTS (*n* = 69)		Total (*N* = 360)	
	n	%	*n*	%	*n*	%	*n*	%	*N*	%
Age Group										
18—21	13	14	19	17	16	18	15	22	63	18
22—25	27	28	35	32	15	17	14	20	91	25
26—34	32	33	33	31	34	39	25	36	124	35
35—44	18	19	17	16	18	21	13	19	66	18
45+	6	6	4	4	4	5	2	3	16	4
Race										
White	51	53	45	42	43	49	34	49	173	48
Hispanic	37	39	53	49	38	44	33	47	161	45
Other	8	8	10	9	6	7	2	3	26	7
Program										
RTP-A	36	38	38	35	43	49	23	33	139	39
RTP-B	29	30	28	26	24	28	21	31	102	28
DCP	31	32	43	39	20	23	25	36	119	33
	M (SD)		*M (SD)*		*M (SD)*		*M (SD)*		*M (SD)*	
Age (years)	29.4 (8.4)		27.8 (7.4)		29.8 (8.3)		28.5 (7.7)		28.9 (7.9)	

Note. NTS = No Traumatic Stress; DA = Defensive Avoidant; PTS = Post-Traumatic Stress; CPTS = Complex Post-Traumatic Stress; RTP-A = Residential Treatment Program A; RTP-B = Residential Treatment Program B; DCP = Drug Court Program

Question Two

The second research question explored the relationship between women's reported trauma history and traumatic stress symptomatology. First, it was hypothesized that women's report of lifetime interpersonal trauma would differ by traumatic stress symptom profile. It was predicted that women in the CPTS group would be more likely to report lifetime sexual and physical abuse, while women in the NTS cluster would have the lowest prevalence of interpersonal trauma. Next, it was predicted that developmental trauma, defined as recurrent, interpersonal victimization before age 14 years, would be most prevalent for women in the CPTS group and least prevalent for the NTS cluster. Finally, it was predicted that the mean total ACE score would be greatest for women exhibiting cumulative traumatic stress symptomatology in adulthood. Furthermore, it was hypothesized that the total ACE score would be greatest for women in the CPTS cluster and least for women in the NTS group. Tables 4 through 6 summarize the results of analyses examining these hypotheses.

Analyses for lifetime interpersonal trauma. A chi-squared analysis was conducted to examine the prevalence of lifetime interpersonal trauma between trauma symptom profile clusters. Items from the ASI assessing lifetime history of physical abuse and sexual abuse were recoded into three categories of interpersonal trauma history: (a) sexual abuse with or without physical abuse, (b) physical abuse only, and (c) no interpersonal trauma. The sexual abuse variable included women who also reported concomitant physical abuse because 89% of women reporting sexual abuse also reported lifetime history of physical abuse. As detailed in Table 4 and Figure 3, the results revealed significant differences between traumatic stress symptom clusters in the prevalence of interpersonal trauma in women's lifetime, $\chi^2 (6, N = 360) = 26.23, p < .001$. As predicted, women who did not report a history

of interpersonal trauma were most frequently in the NTS (39.6%) and DA (30.8%) clusters; however, some women in the PTS and CPTS groups, which were considered to represent simple and complex trauma symptoms, did not report a history of interpersonal trauma. The largest proportion of women reporting a lifetime history of sexual abuse with or without physical abuse was in the CPTS cluster (68.1%), as compared to the PTS cluster (50.6%), DA cluster (42.1%), and NTS cluster (30%). The proportion of women reporting physical abuse only was statistically similar across cluster groups, ranging from 18.8% (CPTS) to 30.2% (NTS).

Analyses for complex trauma. As depicted in Table 5 and Figure 4, a chi-squared analysis indicated clusters did not differ significantly in the proportion of women reporting recurrent interpersonal abuse during childhood (i.e., CPTS group), $\chi^2 (3, N = 163) = 11.07$, $p = .011$. A proportion of women in every cluster reported recurrent childhood interpersonal trauma, including the NTS (40.0%), DA (54.4%), and PTS (58.3%) clusters. As predicted, the largest prevalence was among women in the CPTS cluster (76.5%).

Analyses for adverse childhood experiences. A one-way analysis of variance (ANOVA) was conducted to examine differences in ACE scores across traumatic stress symptom groups. Assumptions of independence of observations, normality of residuals, and homogeneity of variance were tested and met. The one-way ANOVA test results are detailed in Table 6, and revealed a significant effect of traumatic stress symptomatology, $F (3, 146) = 6.56$, $p < .001$. The strength of the relation between traumatic stress symptomatology and ACE score, as assessed by partial η^2, was small to medium, with the traumatic stress

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symptom group accounting for 11% of the variance in total ACE score. Using the

Bonferonni correction[g], follow-up Tukey tests were conducted to evaluate pairwise

differences between group means.   As depicted in Figure 5, results indicated that the average

ACE score was significantly higher for women in the CPTS cluster *(M = 6.60, SD = 2.44)*

than in the NTS *(M = 3.77, SD = 3.00)* or DA *(M = 3.77, SD = 2.68)* clusters. The average

ACE score among women in the PTS cluster *(M = 4.82, SD = 2.92)* did not differ

significantly from scores in any of the other symptom clusters.

    In sum, question 2 was partially supported. Women's cumulative, interpersonal

trauma histories differed by traumatic stress symptomatology. As predicted, women in the

CPTS cluster reported greater incidence of lifetime interpersonal trauma (i.e., sexual abuse

with or without physical abuse), childhood complex trauma, and adverse childhood

experiences, than did women in the NTS symptom cluster.

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[g] Bonferroni correction was used to adjust the alpha used to determine the significance of the follow-up
pairwise comparisons. The significance level was adjusted to $\alpha = .05/4 = .0125$.

Table 4

Interpersonal Trauma History by Cluster (*N* = 359)

Trauma Variable	NTS (*n* = 96)		DA (*n* = 108)		PTS (*n* = 87)		CPTS (*n* = 69)		χ^2 (df)	*p*
	n	%	*n*	%	*n*	%	*n*	%		
Interpersonal Trauma									26.23 (6)	< .001
Sexual /Physical	29	30	45	42	44	51	47	68		
Physical only	29	30	29	27	22	25	13	19		
None reported	38	40	33	31	21	24	9	13		

Note. NTS = No Traumatic Stress; DA = Defensive Avoidant; PTS = Post-Traumatic Stress; CPTS = Complex/Cumulative Traumatic Stress.

Figure 3.

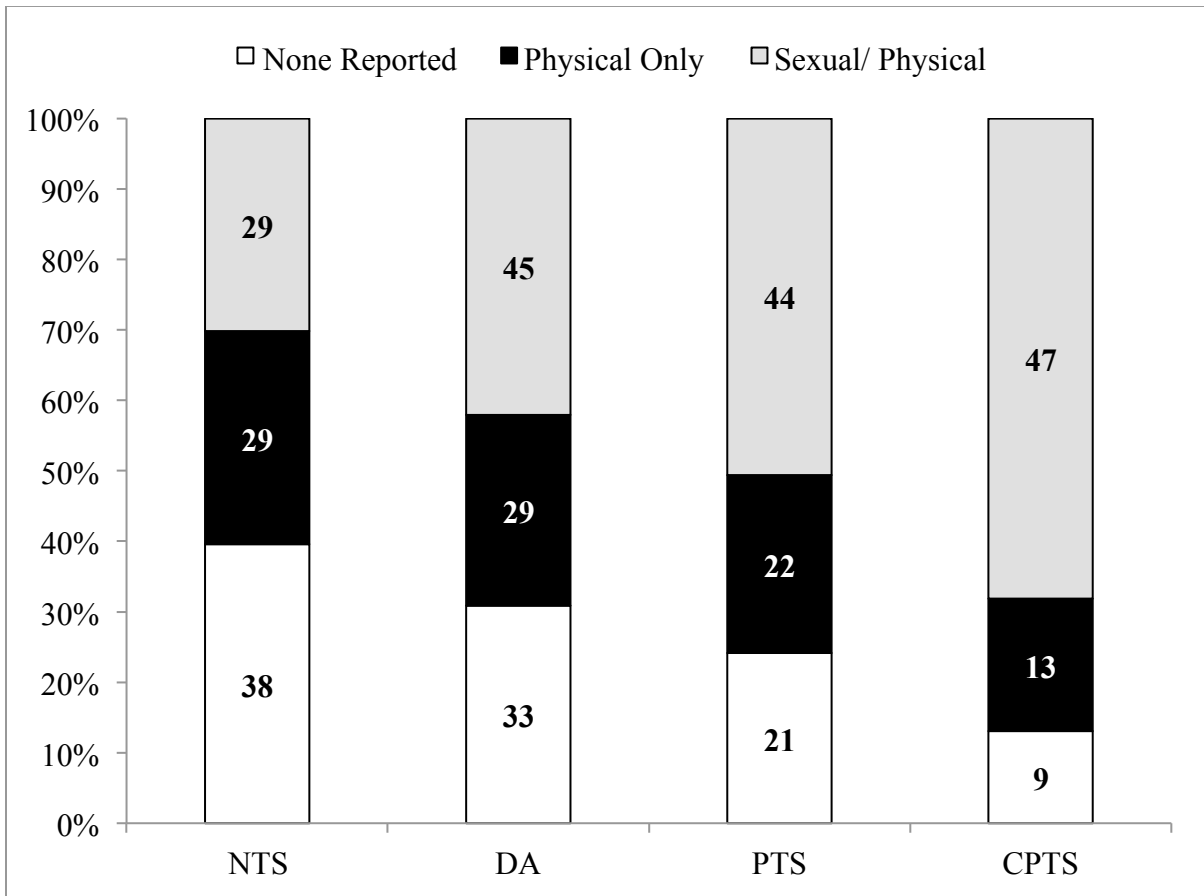*Prevalence of Lifetime Interpersonal Trauma Type by Cluster*

Table 5

Recurrent Childhood Interpersonal Trauma History by Cluster ($N = 163$)

	NTS ($n = 48$)		DA ($n = 57$)		PTS ($n = 24$)		CPTS ($n = 34$)		χ^2 (df)	*Diff*
	n	%	*n*	%	*n*	%	*n*	%		
Complex Trauma									11.07(3)***	
Complex Trauma[h]	19	40	31	54	14	58	26	76		CPTS > NTS
None Reported	27	60	29	46	10	52	8	24		NTS > CPTS

Note. Diff denotes where the column proportions differ significantly at the .05 significance level among the No Traumatic Stress (NTS), Defensive Avoidant (DA), Post-Traumatic Stress (PTS), and Complex Post-Traumatic Stress (CPTS) groups.
*** $p < .001$.

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[h] Complex trauma variable reflects endorsement of the all of the following trauma-specific factors: interpersonal trauma (i.e., physical and/or sexual abuse), recurrence (i.e., recurrent/multiple instances), and childhood onset of abuse (i.e., reported age ≤ 17).

Figure 4.

Frequency of Reported Childhood Interpersonal Trauma by Cluster
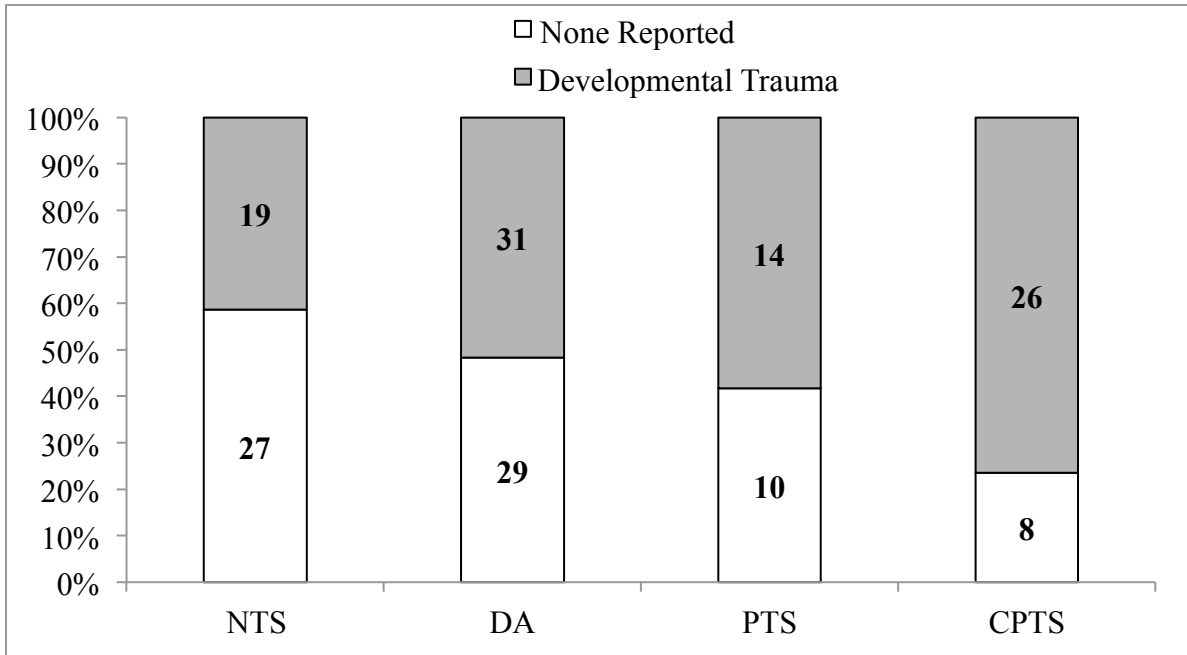
Table 6

Adverse Childhood Experiences (ACE) Comparisons by Cluster

	NTS (*n* = 48)		DA (*n* = 50)		PTS (*n* = 22)		CPTS (*n* = 30)		χ^2 (df)	*p*
	n	%	*n*	%	*n*	%	*n*	%		
ACE score									16.00[9]	.001
4+ ACEs	22	46	29	58	15	68	27	90		
< 4 ACEs	26	54	21	42	7	32	3	10		

Note. No Traumatic Stress (NTS), Defensive Avoidant (DA), Post-Traumatic Stress (PTS), and Complex/Cumulative Traumatic Stress (CPTS)

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[9] Chi-squared value should be interpreted with caution due to cell size < 5

Figure 5.

Mean Adverse Childhood Experiences (ACE) Scores by Cluster
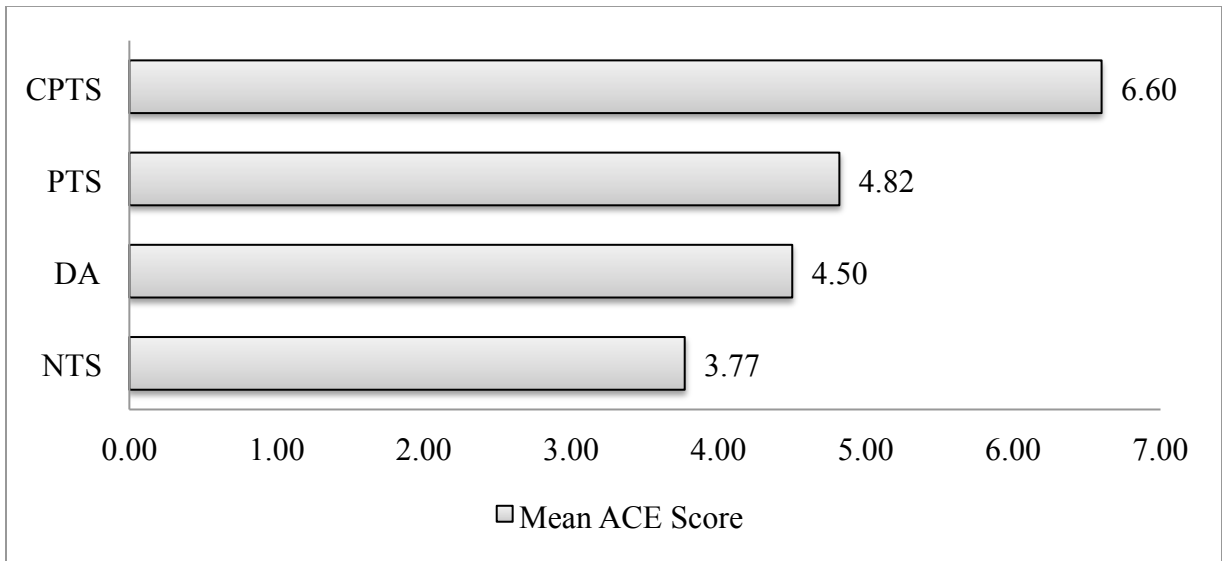
Note. No Traumatic Stress (NTS), Defensive Avoidant (DA), Post-Traumatic Stress (PTS), and
Complex/Cumulative Traumatic Stress (CPTS)

Question Three

The third research question explored whether women's traumatic stress symptom profile at intake related to program completion of trauma-informed substance abuse treatment. It was hypothesized that women exhibiting complex traumatic stress symptomatology would be less likely to successfully complete their respective trauma-informed treatment program.

Program completion outcomes were compared between traumatic stress symptom clusters for women enrolled in gender-specific, residential treatment and drug court models of trauma-informed substance abuse treatment programs. The results of chi-squared analyses were nonsignificant for the women in residential treatment, $\chi^2 (3, N = 235) = 4.00$, *ns*, or drug court, $\chi^2 (3, N = 115) = 5.90$, *ns*. The percent of women successfully completing treatment was similar for the residential (59.1%) and drug court (60.9%) treatment programs.

Thus, question three was not supported. Results indicated statistically similar rates of program completion across traumatic stress symptom clusters. Nevertheless, a few interesting trends emerged in the frequency data. In both treatment models, the CPTS and NTS clusters had similar program completion rates, with the highest success rates in residential treatment (CPTS, 71%; NTS, 70%) and lowest completion rates in the drug court program (CPTS, 57%; NTS, 55%). Similarly, a greater proportion of the PTS group was more successful in residential treatment programs (60%) than drug court program (40%). While not statistically significant, the similarity of treatment outcomes between the most disparate clinical groups is an unexpected result. Furthermore, women entering treatment with simple and complex traumatic stress symptomatology appeared to be relatively more successful in gender-specific residential treatment than in the intensive outpatient treatment of the drug court program.

Chapter V

Discussion

This study explored the prevalence of complex trauma and traumatic stress among adult women entering treatment for substance use disorders (SUD). Both research and policy have verified the frequent co-occurrence of trauma and substance abuse leading to the initiative for trauma-informed systems of care (Elliott et al., 2005). In particular, women in SUD treatment are more likely to have been a victim of interpersonal trauma, including childhood sexual abuse, at rates that far exceed the general population (e.g., Chilcoat & Menard, 2003). Only a few studies, however, have examined the phenomena of complex posttraumatic stress (CPTS) among adults in substance abuse treatment (e.g., Ford & Smith, 2008), but clinical symptoms of CPTS reactions, such as dissociation and emotional regulation problems, have been documented in studies of SUD women and cited as possible barriers to treatment retention and outcomes (Hien, Cohen, & Campbell, 2005).

Therefore, this study sought to explore whether women entering treatment for SUD exhibited distinct profiles of simple and complex traumatic stress, and how symptomatology related to women's cumulative trauma history and trauma-informed SUD treatment completion. Traumatic stress symptomatology was explored in two ways: (a) symptom profiles based on intake *T*-scores on simple and complex posttraumatic stress symptom domains of the Trauma Symptom Inventory (TSI; Briere, 1995), and (b) cumulative traumatic stress symptom complexity (e.g., Briere et al., 2008; Cloitre et al., 2009). Comparison of emergent clusters examined differences in women's reported complex trauma history, adverse childhood experiences, and program completion.

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Results from the cluster analysis revealed a typology of four distinct traumatic stress symptom profiles among women entering SUD treatment. Table 3 details cluster centroids and descriptive data for the final four-cluster solution. As hypothesized, cluster centroids on simple and complex trauma symptom domains created three symptom profiles consistent with trauma psychology theory and research: (a) No Traumatic Stress (NTS) cluster characterized by nonclinical centroid *T*-scores on all symptom domains; (b) Post-Traumatic Stress (PTS) cluster characterized by clinical-level centroids scores on simple posttraumatic stress symptoms (e.g., Defensive Avoidance, Intrusive Experiences) but subclinical centroids on complex traumatic stress symptom domains; (c) Complex/Cumulative Traumatic Stress (CPTS) cluster characterized by clinical-level centroids on simple and complex traumatic stress symptom domains. In addition, an unanticipated symptom profile, Defensive Avoidant (DA), emerged among women in SUD treatment characterized by elevated scores on the Defensive Avoidance subscale and average centroid scores on all other symptom domains. As hypothesized, cumulative traumatic stress symptom complexity was greatest among women in the CPTS cluster, followed by the PTS, DA, and NTS clusters, respectively.

Women's interpersonal trauma histories differed by traumatic stress symptomatology. As predicted, women in the CPTS cluster reported greater incidence of lifetime interpersonal trauma (i.e., sexual abuse with or without physical abuse), childhood complex trauma, and adverse childhood experiences than did women in the NTS symptom cluster. Assessment of complex trauma indicated a proportion of women in every cluster reported recurrent childhood interpersonal trauma, including the NTS (40.0%), DA (54.4%), and PTS (58.3%) clusters, but, as predicted, complex childhood trauma was most prevalent among women in the CPTS cluster (76.5%).

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In addition, this study explored cumulative, developmental stressors by examining the prevalence of adverse childhood experiences (ACE) and its relation to traumatic stress symptomatology in adulthood. Comparison between clusters revealed the average ACE score was significantly higher for women in the CPTS cluster ($M = 6.60$, $SD = 2.44$) than the NTS ($M = 3.77$, $SD = 3.00$) or DA ($M = 3.77$, $SD = 2.68$) clusters. The average ACE score among women in the PTS cluster ($M = 4.82$, $SD = 2.92$), however, did not differ significantly from scores in any of the other symptom clusters.

Finally, traumatic stress symptom clusters did not differ in rates of program completion for either trauma-informed substance abuse treatment model (i.e., Gender-specific Residential; Drug Court).

Implications

First and foremost, this study provides evidence that women in SUD treatment exhibit distinct symptom profiles of complex traumatic stress. Consistent with findings from the DSM-IV-TR field trials (e.g., van der Kolk et al., 2005), the ISTSS expert panel on complex trauma (Cloitre et al., 2011), proposed latent profile analysis findings supporting the inclusion of Complex PTSD in ICD-11 (Cloitre, Garvert, D. W., Brewin, Bryant, & Maercker, 2013), and previous research with adults in SUD treatment (Ford & Smith, 2008), the CPTS cluster centroids fell in the clinical range for both simple and complex traumatic stress symptom domains.

Further, the PTS cluster centroid scores suggested women in SUD treatment are experiencing clinically relevant symptoms of simple posttraumatic stress (i.e., Intrusive Experiences, Defensive Avoidance, Anxious Arousal). In addition, the PTS cluster centroids were elevated for Dissociation ($T = 62.82$) and Depression ($T = 61.71$) centroid, but within

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the average range on other symptoms of complex PTSD (i.e., Anger/Irritability; Self-Dysfunction). Both elevations are consistent with research documenting the comorbid depression (e.g., Breslau, 2000) and dissociation (e.g., Cohen & Hien, 2006) among individuals with co-occurring SUD and PTSD.

The elevation of the Dissociation subscale for both PTS and CPTS symptom profiles is consistent with substantial empirical evidence converging from epidemiological, fMRI, and clinical treatment studies leading to the proposal of a dissociative subtype of PTSD for DSM-5 (see Friedman, Resick, Bryant, & Brewin, 2011). For instance, neuroimaging research over the past few decades provided compelling evidence that individuals with severe PTSD who dissociate, "exhibit a distinct neurocircuitry marked by over-modulation of brain regions governing emotion" (Lanius et. al, 2012). Thus, the elevation in the Dissociation centroid may suggest that some PTS women exhibit clinical symptoms of the dissociative subtype of Simple PTSD, while most women in the CPTS cluster would likely meet criteria.

In contrast, the NTS cluster provided evidence that many women entering SUD treatment do not present with traumatic stress symptoms. Examination of NTS women's interpersonal trauma history, however, revealed that 60% reported a lifetime history of sexual or physical abuse. Furthermore, more nuanced trauma history data available on a subset of the sample indicated that 40% of NTS women surveyed reported a history of childhood complex trauma and 48% had an ACE score of four or more. Thus, the NTS cluster includes a resilient subgroup of women in SUD treatment who have experienced cumulative, complex trauma but do not report posttraumatic stress in adulthood. This finding is consistent with neurobiological (e.g., Yehuda & LeDoux, 2007), epidemiological (e.g., Breslau, 2001; Chilcoat & Menard, 2003), and SUD treatment (e.g., Becker et al., 2005) research evidencing

inter-individual variability of human responses to psychological trauma. Alternatively, women reporting interpersonal trauma in the NTS cluster may have received prior mental health treatment services that successfully addressed any trauma-related symptomatology.

Furthermore, the emergence of the DA cluster may reflect a distinct symptom profile among SUD women. The overall sample mean on the DA subscale ($M = 60.83$, $SD = 10.10$) was elevated one standard deviation above the normative mean, providing evidence that DA symptoms are more frequently endorsed by SUD women than the general population. Items on the DA subscale assess avoidance of difficult emotions and past experiences (Briere, 1995), but do not state that avoidant reactions are trauma-specific. Perhaps women in the DA cluster exhibit "overdeveloped avoidance responses" conceptualized by Briere and Spinazzola as including substance abuse and affective avoidance (2005), but without the dissociative symptoms included in the construct by the authors.

Adding to previous research on SUD populations, this study provides further evidence that the majority of women entering SUD treatment have experienced interpersonal trauma during their lifetime (e.g., Hien, Cohen, & Campbell, 2005; McHugo et al., 2005), thereby supporting the trauma-informed perspective that a history of interpersonal victimization is the norm rather than the exception among women seeking SUD treatment. This study illuminates, however, that focus in research and clinical work should include consideration of trauma symptoms rather than just trauma history. Further, complex trauma history information was available on a subset of the sample. Results indicated that 55% of the women reported a history of childhood complex trauma defined as recurrent physical and/or sexual abuse by a known perpetrator before age 18 years. Women in all symptoms clusters reported childhood complex trauma, but the prevalence was significantly greater

among women exhibiting cumulative, complex traumatic stress symptoms in the CPTS cluster.

In addition, this study builds upon findings from the ACE study by substantiating the frequency of adverse childhood experiences among a population of women with SUD. Notably, among the subsample of women in trauma-informed SUD treatment in this study, 62.0% had an ACE score of four or more, compared to 15.2% of women surveyed in the ACE study (CDC, http://www.cdc.gov/ace/prevalence.htm). This study's finding of elevated ACE scores within the context of SUD treatment is consistent with epidemiological research from the ACE study on alcohol abuse (Anda et al., 2002) and drug abuse (Dube et al., 2002), and supports the ACE study researchers' hypothesis that the cumulative impact of multiple ACE stressors may relate to the "origins of addiction," (Felitti, 2004).

Finally, while program completion rates were statistically similar across cluster groups in both models of trauma-informed treatment, a few interesting trends emerged among the frequency data. Most unexpectedly, program completion rates were similar for the most disparate clinical groups (i.e., CPTS and NTS) in both treatment models. In addition, women entering treatment with simple and complex traumatic stress symptomatology appeared to be relatively more successful in gender-responsive residential treatment than in the intensive, 12 to18-month intensive outpatient treatment in the drug court program. These preliminary trends suggest that the intersection between treatment program and traumatic stress symptomatology warrants closer examination of factors specific to the individual, treatment program, and psychosocial domains that may influence participant engagement, retention, and outcomes in trauma-informed SUD treatment. For instance, the programs included in this study were flexible and responsive to clients'

individual needs, and provided more intensive treatment when clinically indicated. Anecdotal information provided to the program evaluation researcher via monthly team meetings suggested that additional services might include referral for psychiatric evaluation, medication management, individual psychotherapy, discharge to a higher level of care, case management, increased legal supervision, or any other psychosocial services available within the community to participants.

Future Research

As noted by the complex PTSD task force (Resick et al., 2012), it is imperative that the field of traumatic stress psychology establishes a consistent definition of the construct of complex PTSD, and develops comprehensive and validated assessments of CPTSD symptoms that can differentiate the diagnosis from similar comorbid disorders. This study provides evidence that women in SUD treatment are a relevant clinical population for assessment and treatment research focused on CPTSD. As such, researchers should carefully consider whether purposeful exclusion of individuals with substance use disorders creates selection bias that may threaten construct, internal, or external validity of translational research. Further, studies comparing CPTSD among women with and without co-occurring SUD will provide empirical support clarifying whether these are two distinct clinical subgroups of consumers versus whether SUD may be a behavioral symptom of CPTSD.

In addition, future research should examine whether latent variables underlie the relation between childhood complex trauma, adverse childhood experiences, cumulative trauma exposure, and the continuum of traumatic stress symptomatology among substance abusing adults. Building upon the scholarship of experts in the field of psychological resilience (e.g ., Masten, 2001), future research utilizing a more dimensional model of

complexity of factors leading to traumatic stress states, model-based research will help to examine the how the factors specific to the potentially traumatic stressor, individual, and environment relate to the development of complex traumatic stress or psychological resilience. In addition, prospective research designs will be instrumental in examining differences in trajectories to comorbid psychopathology—including substance use severity—before and after complex trauma exposure. Latent growth curve modeling will be instrumental in examining the cumulative changes in trauma symptomatology following multiple exposure to potentially traumatic experiences.

Future studies of co-occurring psychopathology among individuals with SUD should include measures of simple and complex posttraumatic stress. Moreover, it is recommended that studies include measures that will help differentiate trauma-specific defensive avoidance versus more global avoidance of difficult affect as a coping style. In addition, it would be beneficial to design multisite studies examining treatment retention, changes in simple and complex traumatic stress symptoms, and post-discharge relapse in different models of trauma-informed SUD treatment (e.g., gender specific, residential, intensive outpatient, drug court) and CPTSD treatment phase (e.g., Cloitre et al., 2011).

Limitations

One limitation of this archival study was that the construct of complex PTSD was not fully captured by measures available in the dataset. The TSI was not designed to assess complex traumatic stress specifically, but rather sought to assess a broad range of trauma-related symptoms of psychological distress associated with trauma-exposure based upon theory and research at the time of test development (Briere, 1995). While the TSI clinical subscales and factor summary scores assessed many symptoms of simple and complex

posttraumatic stress, this study did not include measure of two CPTSD symptom domains: (a) somatization and (b) altered belief systems. Consequently, this study utilized a more exploratory method for examining the observed traumatic stress symptomatology of women in the sample.

Relatedly, another limitation of this study was the lack of information about women's specific psychiatric diagnoses, including PTSD, SUD, and other comorbid psychological disorders known to co-occur with the aforementioned clinical diagnoses (e.g., Depression, Borderline Personality Disorder, Bipolar Disorder). This information would have provided a more rich understanding of the psychiatric presentation of women in the sample, and external validation of DSM-IV-TR diagnosis of PTSD when evaluating cluster solutions.

In addition, specific information about women's complex trauma history and ACE score were only available for a subset of the sample as these measures were not administered to most women enrolled in the FSOCC grant program. Further, in order to give participants adequate exposure to the treatment program to be able to evaluate satisfaction, the program evaluation team administered the consumer survey after three months of treatment. Thus, another limitation of the current study is that complex trauma and ACE score data were collected for participants who stayed in treatment at least 90 days. Finally, this study may be biased due to selection of a convenience sample from an archival sample of participants enrolled in grant-funded substance abuse treatment within a specific geographical region.

Conclusions

Women in SUD treatment exhibit a range of traumatic stress symptomatology, including clinical symptom profiles of simple and complex traumatic stress. Consequently, assessment and treatment practices should evolve to include best practices for assessment and

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treatment of co-occurring SUD and complex PTSD. In addition, SUD practitioners' and researchers' should include a comprehensive assessment of women's cumulative trauma history that asks about a range of potentially traumatic experiences as well as factors specific to complex traumatic stressors (e.g., age, relationship to perpetrator, and recurrence).

Furthermore, examination of the relation between childhood adverse childhood experiences and complexity of traumatic stress, adds to the findings of the ACE study (e.g., Dube et al., 2002; Felitti et al., 1998) in supporting the trajectory from childhood adversity to adult symptomatology. These findings can help inform both prevention efforts to reduce incidence of childhood ACEs, as well as reveal additional psychosocial treatment needs for women suffering from complex traumatic stress and substance abuse. The ACE scale could be used as a screening tool in trauma-informed treatment programs to identify women who might benefit from assessment of complex PTSD symptoms and appropriate treatment planning and intervention to address the range of clinical symptom complexity presented.

In sum, the findings from this study add to the trauma-informed substance abuse treatment knowledge base and can help improve services for women. Given the prevalence of interpersonal, complex, and cumulative trauma among women entering SUD treatment, the results of this study suggest that the field should continue to develop complex-trauma-informed substance abuse treatment and research.

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Appendix A

Table 7

Adverse Childhood Experiences Scale

Think specifically about while you were growing up, during your first 18 years of life

1. ☐ Yes ☐ No   Did a parent or other adult in the household **often or very often** swear at you, insult you, put you down, or humiliate you? **_or_** Act in a way that made you afraid that you might be physically hurt?

2. ☐ Yes ☐ No   Did a parent or other adult in the household **often or very often** push, grab, slap, or throw something at you? **_or_ Ever** hit you so hard that you had marks or were injured?

3. ☐ Yes ☐ No   Did an adult or person at least 5 years older than you **ever** touch or fondle you or have you touch their body in a sexual way? **_or_** Attempt or actually have oral, anal, or vaginal intercourse with you?

4. ☐ Yes ☐ No   Did you **often or very often** feel that no one in your family loved you or thought you were important or special? **_or_** Your family didn't look out for each other, feel close to each other, or support each other?

5. ☐ Yes ☐ No   Did you **often or very often** feel that you didn't have enough to eat, had to wear dirty clothes, and had no one to protect you? **_or_** Your parents were too drunk or high to take care of you or take you to the doctor if you needed it?

6. ☐ Yes ☐ No   Were your parents **ever** separated or divorced?

7. ☐ Yes ☐ No   Was your mother or stepmother **often or very often** pushed, grabbed, slapped, or had something thrown at her? **_or_ Sometimes, often, or very often** kicked, bitten, hit with a fist, or hit with something hard? **_or_ Ever** repeatedly hit at least a few minutes or threatened with a gun or knife?

8. ☐ Yes ☐ No   Did you live with anyone who was a problem drinker or alcoholic or who used street drugs?

9. ☐ Yes ☐ No   Was a household member depressed or mentally ill, or attempt suicide?

10. ☐ Yes ☐ No Did a household member go to prison?