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A Network Analysis Examining Dissociation and Suicide Risk in Military Veterans and Non-Veterans

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A NETWORK ANALYSIS EXAMINING DISSOCIATION AND SUICIDE RISK IN

MILITARY VETERANS AND NON-VETERANS

by

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ABSTRACT

Higher rates of dissociation are related to more severe psychopathology, psychiatric comorbidity, and poorer response to treatment, yet there is limited research examining dissociation as a transdiagnostic factor. In particular, examining dissociation in a Veteran sample is vital, as Veterans have been shown to have higher trauma exposure and dissociation rates than non-Veterans. Dissociation has been linked to several adverse outcomes related to Veterans, particularly suicide, as dissociation may increase the possibility of a suicidal act because of intensified disconnect from the body. However, research examining the relationship between dissociation, suicide, and additional related factors has been limited, given the complexity of these relationships. Recently, a statistical technique called network analysis has made it possible to expand our understanding of how dissociation relates to suicide and other related comorbid disorders by allowing the examination of multiple complex interactions and facilitators and comparing these networks to civilian samples.

Military Veterans (n=254) and a comparative sample of non-Veterans (n=284) were recruited for a brief survey through online platforms. Our results indicated that Veterans reported significantly higher levels of depersonalization and derealization, dissociative amnesia, suicidal ideation, posttraumatic stress symptoms, anxious arousal, and pain tolerance; however, non-Veterans reported significantly higher levels of emotion dysregulation. Network analysis results revealed that there were no significant differences in network structures or node strength between these two networks, and addressing dissociative amnesia, depressive symptoms, and generalized anxiety may have broad effects on overall symptomatology for both Veterans and non-Veterans. However,

there were some differences in the relative expected influence of nodes on the model in Veterans compared to non-Veterans, namely, that depersonalization and derealization may be important to consider and influence overall pathology in Veterans. Limitations of this study included uneven sample sizes within subsamples and the use of a cross-sectional sample, which limits the ability to determine causality. Future studies using longitudinal and multimodal approaches are needed to continue to investigate the potential causal mechanisms underlying these relationships.

ACKNOWLEDGMENTS

DEDICATION

I would like to dedicate this thesis to my mother, Denise Patricia Caulfield, who tragically passed away in 2019. Mom, you are my continual hope and give me the strength to finish this journey. Thank you for being my ultimate inspiration. I love and miss you forever.

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LIST OF ABBREVIATIONS

DAS Depression, Anxiety, and Stress Scale-21 Autonomic Arousal Subscale

DER Difficulties in Emotion Regulation Scale Symptoms

DpD Depersonalization and Derealization Symptoms

DsAm Dissociative Amnesia Symptoms

DsAb Dissociative Absorption and Consumption Symptoms

GAD Generalized Anxiety Disorder-7 Symptoms

PCL Posttraumatic Checklist-5 Symptoms

PHQ Patient Health Questionnaire Depression Symptoms

PnT Acquired Capability for Suicide Pain Tolerance

SIS Suicidal Ideation Scale Symptoms

CHAPTER I - INTRODUCTION

Dissociation is defined as the presence of disruptions of identity, consciousness, reality, and control, often causing altered perceptions of the self and the outside environment (Lanius et al., 2012; van Heugten et al., 2018). Yet, dissociation is a transdiagnostic factor involved in the development and maintenance of various conditions (Calati et al., 2017; Lyssenko et al., 2018), such as suicidal ideation and attempt behaviors (Herzog et al., 2020; Levinger et al., 2015; Webermann et al., 2016), depression symptoms (Herzog et al., 2020; Maaranen et al., 2005), anxiety and anxious arousal symptoms (Lyssenko et al., 2018), emotion dysregulation (Ebner-Priemer et al., 2005, 2009), capability for suicide and pain tolerance (Caulfield et al., 2022; Shelef et al., 2014), and posttraumatic stress symptomology (e.g., Briere et al., 2005; Lanius et al., 2012). Despite dissociation being associated with more severe psychopathology, psychiatric comorbidity, and poorer response to treatment, there is limited research examining dissociation as a transdiagnostic factor (Herzog et al., 2020; Somer et al., 2012).

Recent research on dissociation was focused on clarifying the link between dissociation and PTSD symptomology. High rates of dissociation are most often exhibited after exposure to trauma, with the highest rates being found in survivors of child abuse, sexual assault, and military combat (Bremner et al., 1992; Wolf et al., 2012; Ozdemir, 2015). In the DSM-5, the dissociative subtype of PTSD was added to capture those who respond to trauma with emotional detachment (Schiavone et al., 2018; van Huijstee & Vermetten, 2018). Those diagnosed with this subtype meet criteria for PTSD

with the additional presence of dissociative symptoms, namely depersonalization and derealization (Schiavone et al., 2018).

However, dissociation does not exclusively occur in the context of trauma and PTSD (Herzog et al., 2020) and is involved in the development and maintenance of a range of disorders (Calati et al., 2017; Lyssenko et al., 2018). Researchers have proposed that dissociation may be a response to intensive emotions rather than be a symptom of a specific disorder (Herzog et al., 2020). Dissociation may be used as a stress response which allows those who dissociate to disengage from reality, resulting in the stress temporarily becoming unconscious from their awareness (Putnam, 1997). Further, frequent dissociation may contribute to the development and maintenance of psychopathology (Herzog et al., 2020). By disengaging from psychological distress, an individual may be less attuned to internal emotional states, dampening response cues to threats. In turn, this can disrupt cognitive and attentional processes required for emotion regulation and crisis coping (Herzog et al., 2020).

<center>Dissociation in Veterans</center>

Recently, researchers have highlighted the lack of research examining dissociation and suicide in U.S. military Veterans (Herzog et al., 2020; Smith et al., 2020). Veterans are more likely to experience dissociation than non-Veterans because they are more likely to be exposed to traumatic events in the military and childhood (Özdemir et al., 2015). Researchers have shown that Veterans are more likely to experience interpersonal traumas that often demonstrate the highest dissociation rates, such as childhood trauma, combat trauma, and military sexual trauma (Blosnich et al., 2014; Özdemir et al., 2015). Veterans are also more likely to be diagnosed with the

dissociative subtype of PTSD than the general population, with studies indicating between 8 to 32 percent of Veterans exhibiting high rates of depersonalization and derealization (Özdemir et al., 2015).

Moreover, military personnel are more likely to be diagnosed with certain mental health conditions that have been associated with increased dissociation, such as anxiety and anxious-arousal, PTSD, and depression (Inoue et al., 2021; Rosellini et al., 2015). Veterans are also more likely than non-Veterans to be diagnosed with multiple comorbid disorders (Rosellini et al., 2015). One concern for Veterans that seems to be related to dissociation is suicide risk, as Veterans are 1.5 times more likely to die by suicide than non-Veterans (Department of Veteran Affairs, 2018).

Dissociation and Suicide in Veterans

Understanding suicide risk among Veterans is an urgent concern, as Veterans account for 18% of suicides nationwide (Flory et al., 2017). Given these facts, there has been an increase in studying suicidal causes, and many risk factors for suicide (e.g., depression, anxiety and arousal, emotion regulation, posttraumatic stress disorder [PTSD], and capability for suicide) have been identified for veteran personnel (Lemaire & Graham, 2011; Monteith et al., 2013; Stanley & Larsen, 2019; Wood et al., 2020). Yet, recent meta-analyses have shown that these risk factors are only weak indicators of suicide attempts and suicide death (Belsher et al., 2019; Franklin et al., 2017).

Recently, dissociation has been highlighted as a central factor to consider for suicide and has even been proposed as a potential facilitator of suicide that may aid in the transition from ideation to attempt behaviors (Caulfield et al., 2021). Several studies found correlations between dissociation and self-harm behavior (e.g., Batey et al., 2010;

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Gratz et al., 2002), and treatment for dissociative disorders appears to be associated with reductions of suicidal ideation and attempts (e.g., Brand et al., 2009). Notably, there is growing evidence that dissociation may be a pertinent factor for suicide attempts (Herzog et al., 2020; Levinger et al., 2015; Webermann et al., 2016), and many risk factors for suicide (e.g., depression, anxiety and anxious arousal, emotion dysregulation, posttraumatic stress symptoms, capability for suicide) are also associated with increased dissociation rates (Calati et al., 2017; Lyssenko et al., 2018). In a nationally representative sample of U.S. Veterans, Herzog et al. (2020) found that Veterans who reported dissociation were five times more likely to report suicidal ideation and four times more likely to report a prior suicide attempt. Additionally, a recent MSRC secondary data analysis examining self-injurious thoughts and behaviors and interoceptive deficits (conceptually related to dissociation; Smith et al., 2020) in a large military sample found that interoceptive deficits were more strongly associated with suicidal ideation, suicide attempt, and attempt lethality over and above other cited risk factors, including PTSD, hopelessness, gender, and age (Smith et al., 2020).

Prior theories have attempted to explain the robust association between dissociation and suicide. Initially, Shneidman (1980) proposed that dissociation leads to the development of a constriction of options and tunnel vision, leading to the suicidal process. In 1990, Baumeister described dissociation as *cognitive deconstruction*, decreasing inhibition to suicidal behavior and increasing the willingness to escape using suicide. The most recent theory proposed by Orbach (1996, 2003) posited that after experiencing a painful or provocative event, repeated detachment and dissociation from the body may facilitate choosing suicide as an option.

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Extant research has not examined the dissociation-suicide relationship in the context of other relevant covariates for dissociation and suicide risk, such as depression, anxiety and arousal, pain tolerance, PTSD, and emotion dysregulation. There has also been no direct comparison of how dissociation might relate to suicide and relevant covariates in a sample of Veterans compared to non-Veterans. Given the heightened risk of trauma exposure and dissociation rates in Veterans, exploring differences in associations between dissociation, suicide, and other comorbid disorders might give insight into the unique risk factors and treatment recommendations for these two samples. Furthermore, examining specific facets of dissociation would help determine which aspects of dissociation are most central to suicide and other comorbidities.

Facets of Dissociation

Dissociation is a complicated phenomenon that involves a multitude of symptoms that lie on a continuum from daydreaming to hallucinations (Lanius et al., 2012). These symptoms include several related components grouped into two main facets: compartmentalization symptoms and detachment symptoms (Rossi et al., 2019). Compartmentalization symptoms refer to when one's mental processes are not unified, and decisions are not entirely under voluntary control. Detachment symptoms are feelings of detachment or separation from everyday experiences. Two common symptoms related to compartmentalization are dissociative amnesia (inability to recall important personal information) and absorption and consumption (tendency to become engrossed and lose self-awareness, van Heugten et al., 2018). Two of the most common detachment symptoms are depersonalization and derealization (van Heugten et al., 2018). Depersonalization is a feeling of detachment from the self and the body and is often

described as a feeling of floating above themselves while observing their actions (van Heugten et al., 2018). Derealization involves feeling as though the external world is unreal or altered, like a dream (van Heugten et al., 2018).

Despite the complex and transdiagnostic nature of dissociation, dissociation is most often studied as a single construct (Lanius et al., 2012). However, examining facets of dissociative can aid in determining which aspect of dissociation is most central to specific disorders. These facets could give insight into treatment recommendations, as dissociation can often lead to treatment resistance and poorer treatment outcomes (Prasko et al., 2016; Semiz et al., 2013). Examining which facets of dissociation are most relevant to certain disorders may lead to more targeted interventions and better treatment outcomes. This question may be especially relevant for those with dissociation and suicidal ideation, as a reduction in dissociation has predicted decreases in suicidal ideation (Lynch et al., 2008). Prior research has indicated that detachment symptoms, particularly, are significantly related to suicide risk (Levinger et al., 2015). Additionally, preliminary research by Caulfield et al. (2021) indicated that detachment symptoms (i.e., depersonalization and derealization symptoms) were the only significant facet of dissociation related to engaging in a suicide-related task.

Indeed, more research is needed to understand the transdiagnostic and complex facets of dissociation and how they are associated with suicide and other comorbidities in a sample of Veteran personnel. Furthermore, comparing these associations with a non-Veteran sample would be valuable to determine if there are distinct differences based on Veteran status. However, prior statistical approaches have been limited in their ability to assess multiple complex interactions. Using a statistical approach called network

analysis, researchers can examine relevant symptoms and covariates as interacting networks that may help explicate these relationships further.

<center>Network Theory</center>

A common approach to conceptualizing mental disorders is called latent theory, which refers to the presence of underlying latent constructs (e.g., major depressive disorder) that cause observable symptoms to emerge (Borsboom, 2017; Cramer et al., 2010). However, this does not consider the common cause hypothesis, where all symptoms co-occur, contributing to the development of a mental disorder. In this conceptualization, symptoms can influence each other, forming feedback loops allowing for the development and maintenance of certain disorders (Borsboom, 2017; Borsboom & Cramer, 2013). This alternative approach suggests that symptoms are related rather than stemming from a latent disorder engendering separate symptoms.

In response to this idea, network theory suggests that instead of symptoms predicting the development of certain disorders, symptoms co-occur, and the causal interactions between them result in the identification of a disorder (Armour et al., 2017; Birkeland et al., 2020; Borsboom, 2017). This theory has four main proposals: (a) mental disorders are best characterized as interactions between different factors in a proposed network, (b) the factors in that network correspond to specific symptoms that have been determined to be associated with such psychopathology, (c) the network structure is generated by patterns of direct causal connections between symptoms, and (d) networks can determine which symptoms, or groups of symptoms, are more central and tightly connected to psychopathology (Borsboom, 2017).

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Network analysis is a statistical method that examines all partial correlations between factors in a network while holding the relationships between all other factors in the network constant (Borsboom & Cramer, 2013). Network analysis consists of two main building blocks, nodes, and edges. Nodes, usually visualized as circles, refer to individual variables included in the model, while edges, visualized as the lines connecting nodes, represent the regularized partial correlation coefficients between them (Borsboom & Cramer, 2013). Greater thickness and edges indicate greater strength of associations, and colors of edges indicate positive or negative associations.

The network structure is indicated by node centrality, which highlights the most relevant factors to the variables of interest (Borsboom & Cramer, 2013). Centrality can be measured through strength, closeness, betweenness, and expected influence (Robinaugh et al., 2016; Smith et al., 2019). Strength refers to the sum of all absolute connections to other nodes, indicating the overall importance of a node within a network structure (Smith et al., 2019). Closeness is the inverse of the mean shortest connection to other nodes in the network, with higher closeness indicating shorter distances and a more direct connection to that given node. Thus, closeness accounts for the connections between nodes and their importance in the global network (Smith et al., 2019). Betweenness refers to the number of times a node falls between the path of two other nodes, and can indicate potential bridge symptoms or comorbidities within a network (Smith et al., 2019). Expected influence is the sum of edge weights, but it considers the negative associations among nodes and is useful for evaluating centrality and strength in networks with both positive and negative correlations (Robinaugh et al., 2016).

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Network analysis can also aid in examining the complexity of psychological disorders and common comorbidities. It is vital to consider comorbidity as an intrinsic feature of mental disorders, and network analysis can allow for the analysis of comorbidity by examining bridge symptoms, which facilitate the development and maintenance of multiple disorders (Borsboom, 2017; Cramer et al., 2010). However, according to network theory, comorbidity is not a bidirectional relationship between those latent variables (Cramer et al., 2010). Instead, comorbidity arises from a direct interconnection of variables from multiple disorders. Exploring comorbidities can help us determine how symptom networks can become self-sustaining, leading individuals to become stuck in maladaptive response patterns (Armour et al., 2017; Borsboom, 2017; Borsboom & Cramer, 2013). Examining node centrality and edge presence can help us determine if dissociation is a bridge symptom to other comorbid disorders, specifically suicide risk in a sample of Veterans and non-Veterans.

<center>Network Approach to Dissociation</center>

To our knowledge, only one network analysis has examined how dissociation relates to other mental health comorbidities using a network analysis framework. Černis et al. (2021) examined how dissociation related to common mental health conditions utilizing a network analysis in a sample of adults in the United Kingdom. Results showed that dissociation is highly connected to other mental health conditions, namely anxiety, depression, and posttraumatic stress symptoms.

This study builds on previous research in two main ways. First, the study by Černis et al. (2021) utilized a novel scale for dissociation in which the psychometric properties are not well established. The current study will utilize the Dissociative

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Experiences Scale-II (DES-II; Carlson & Putnam, 1993), a well-validated and widely used measure of dissociation. Additionally, utilizing the DES-II will also allow us to explore both compartmentalization and detachment facets of dissociation, specifically considering which facets are most relevant to consider for specific disorders.

Second, research has yet to explore how dissociation relates to suicidal ideation within a network analysis framework. Examining how dissociation relates to suicide risk in the context of other established comorbid covariates for both dissociation and suicide risk (e.g., depression, PTSD, emotion regulation, anxiety, anxious arousal, capability) in both Veteran and non-Veteran personnel can aid our understanding of how these disorders are connected and how their pathways might lead to suicide risk. By examining these factors through network analysis, we can determine the most central variables for these two populations, which can be determined as targets for intervention. In fact, a recent study indicated that node centrality was strongly related to prognostic utility, highlighting the importance of how determining central symptoms can provide further understanding of clinical impairment and treatment intervention (Elliott et al., 2020). Network analysis is also a valuable tool for generating and testing hypotheses about the etiology and maintenance of the dissociation-suicide relationship and its related comorbidities in a sample of Veterans and non-Veterans.

<center>Network Comparison Approach</center>

The beginning stages of psychological network analyses were mainly exploratory, focusing on hypothesis generation to determine the most important and central elements to consider for specific disorders (van Borkulo et al., 2017). However, researchers recently have determined the significance of research that compares network structures

across different populations (van Borkulo et al., 2017). A Network Comparison Test

(NCT) is a two-tailed permutation test that examines differences in network structure,

global network strength, and edge strength between two networks (Schlegl et al., 2021;

Smith et al., 2019). Network structure compares the structure of the network as a whole

to examine whether the network structures are identical or different across

subpopulations (van Borkulo et al., 2017; 2022). Global network strength refers to

comparing the summed value of all the edges between the two networks (Perko et al.,

2019; van Borkulo et al., 2017; 2022). Finally, edge strength invariance testing compares

the absolute difference in edge strength of each specific edge between the two networks

(van Borkulo et al., 2017; 2022). Network comparison is vital because differences in

symptom severity can alter connection strengths between nodes in the network by

influencing symptom variance (Groen et al., 2019). With this approach, one could

compare differences in network structure and edge strength and examine any differences

between specific facets of dissociation, suicidal ideation, and other comorbid disorders in

Veterans and non-Veterans.

Proposed Study

Overall, there is a need to examine the complex relationship between dissociation,

suicide, and relevant covariates in military Veteran and non-Veteran participants.

Through network analysis, this study investigated how dissociation relates to suicide risk

while considering pertinent covariates for both dissociation and suicide, such as

depression (Armour et al., 2014), PTSD (Calati et al., 2017; Smith et al., 2020), emotion

dysregulation (Stanley & Larsen, 2019), anxiety and anxiety-arousal (Armour et al.,

2014), and pain tolerance capability (Shelef et al., 2014) in a sample of Veteran and non-Veteran personnel.

The current study examined one primary aim and two exploratory aims. Given the exploratory nature of network analysis, exploratory aims were proposed in lieu of specific hypotheses for network analyses. For our primary aim, independent samples t-tests were utilized to examine the differences in dissociation severity, suicidal ideation, and related comorbidity severity in Veterans and non-Veterans. Given that prior research has indicated that those with increased dissociation and trauma exposure have increased suicide risk and related mental health comorbidities, it was hypothesized that Veterans would have significantly higher scores on measures of dissociation facets, suicidal ideation, and comorbidity measures (i.e., depression, anxiety, anxious arousal, PTSD, pain tolerance capability, emotion dysregulation) than participants from a non-Veteran sample.

For our exploratory aims, first, the network structure of the Veteran and non-Veteran samples was explored separately by examining the relative importance and centrality of nodes, particularly strength, closeness, betweenness, and expected influence of nodes in both samples. Network analysis was used to determine the most central symptoms in these two networks and how detachment and compartmentalization facets of dissociation are related to suicide risk and other related comorbidities, which could potentially be explored as targets for intervention. The second exploratory aim was to compare network structure, global network strength, and edge strength between Veterans and non-Veterans using a Network Comparison Test to examine if there were any

significant differences in global network structure, network strength, and edge weights between these two samples.

CHAPTER II - METHODOLOGY

Participants

Participants were 300 U.S. military Veterans and a comparison group of 300 non-Veteran civilians. All participants had to be over the age of 18 and speak English fluently. Participants were recruited online in two ways. First, Veterans and non-Veterans were recruited through Prolific's online survey platform. The current study used strategies to enhance data quality and employ methods for screening low-quality data. To ensure we reached a Veteran population, we utilized Prolific's prescreen option to survey eligible participants who had previously identified as military personnel. Recommendations were also utilized to enhance data quality, including asking Veteran eligibility questions for the Veteran sample, examining response time, and adding three instructional attention checks (Bauer et al., 2020). Participants completed a 20-minute survey and were compensated $3.15 for their time. Participants were informed during the consent process that they would only be compensated if they passed all three attention checks throughout the survey.

Given the large sample required for this network analysis, additional participants were recruited for the 20-minute survey through Facebook, email, Reddit, and Twitter platforms. Participants recruited through social media were given the option to enter their email for the chance to win a $25 Amazon gift card. Participants were informed during the consent process that they could only be entered into the gift card drawing if they passed all three attention checks throughout the survey. All participants that completed the survey on Prolific and through social media received the Suicide Prevention Hotline number.

Materials

Dissociation

The Dissociative Experiences Scale-II (DES-II; Carlson & Putnam, 1993) is a 28-item self-report measure of lifetime frequency and intensity of dissociative experiences on a measure of 0-100%. The total is scored by adding the numbers and dividing that total by 28 (the number of questions) to calculate the average score (Carlson & Putnam, 1993).

Additionally, Carlson and Putnam (1993) endorsed an independent three-factor structure of the DES-II that allows for the examination of compartmentalization and detachment symptoms through three dissociative subfactors. These three subfactors are dissociative amnesia, absorption and consumption, and depersonalization and derealization. This factor structure has been supported in several follow-up analyses in general populations (e.g., Armour et al., 2014; Carlson & Putnam, 1993) and clinical populations (Stockdale et al., 2002). Researchers have indicated that the three-factor structure of the DES-II can be utilized as a valid instrument to measure both compartmentalization and detachment symptoms (Carlson & Putnam, 1993; Caulfield, 2020; Garbóczy et al., 2021; Mazzotti et al., 2016). Growing evidence has shown that these three subfactors may provide clinically relevant information on psychopathology and maladaptive mental functioning (Soffer-Dudek et al., 2015).

The psychometric properties and reliability and validity of the DES-II have been well established in several studies (Carlson & Putnam, 1993; Dubester & Braun, 1995; van Ijzendoorn & Schuengel, 1996). In the current study, the DES-II demonstrated excellent internal consistency (Cronbach α = .95). Additionally, all subfactors

demonstrated good internal consistency: amnesia subfactor (Cronbach α = .89), depersonalization and derealization subfactor (Cronbach α = .88), absorption and consumption subfactor (Cronbach α = .84).

Suicidal Ideation

The Suicidal Ideation Scale (SIS; Rudd, 1989) is a 10-item self-report measure of suicidal ideation and includes one item examining past suicide attempts. Items are scored on a Likert scale of 1 (never) to 5 (always), with a total score ranging from 10-50 (Rudd, 1989). Rudd (1989) recommended scores of 15 or higher to be considered as *serious suicidal ideation*. The psychometric properties, including internal consistency, reliability, and validity of the SIS have been well established in college, adult, and military populations (Luxton et al., 2011; Rudd, 1989). In the current study, the SIS demonstrated excellent internal consistency (Cronbach α = .95).

Posttraumatic Stress Symptoms

The PTSD Check List-5 with Criterion A (PCL-5; Weathers et al., 2013) examines past month DSM-5 PTSD-symptom criteria. Respondents first identify the worst event they have experienced in their life (i.e., a stressful event that involved actual or threatened death, serious injury, or sexual violence). Then, respondents complete a 20-item self-report measure assessing past month posttraumatic stress symptoms. Items are rated on a Likert scale ranging from 0 (not at all) to 4 (extremely), with total scores ranging from 0 to 80 and higher scores reflecting higher PTSD symptom severity. The psychometric properties of the PCL-5 have been well established (Blevins et al., 2015; Wortmann et al., 2016). In the current study, the PCL-5 demonstrated excellent internal consistency (Cronbach α = .95).

Capability for Suicide- Pain Tolerance

The Acquired Capability for Suicide Scale (ACSS; Van Orden et al., 2008) is a 20-item self-report measure of how individuals perceive themselves as capable of performing or being exposed to potentially dangerous or fatal situations, including suicide. Items are rated on a Likert scale ranging from 0 (not at all) to 4 (extremely), with some items needing to be reverse scored and total scores ranging from 0 to 80. Higher scores reflect a higher capability to complete dangerous acts, such as dying by suicide. The psychometric properties of the ACSS have been well established (Van Orden et al., 2008). The ACSS has been proposed to have two subscales, fearlessness about death and pain tolerance. Pain tolerance is assessed using one item on the ACSS (i.e., "the pain involved in death does not frighten me"). Only the pain tolerance item will be included in the analysis since it has been associated with both dissociation and suicide risk (Orbach, 1996; Franklin et al., 2011), and the pain tolerance item of the ACSS have been successfully used in prior research (e.g., Ribeiro et al., 2014; Van Orden et al., 2010). The original 20-item measure will be given, but only the pain tolerance question will be included in the analyses (Ribeiro, 2011). In the current study, the ACSS demonstrated good internal consistency (Cronbach α = .80).

Anxiety Arousal

The Depression, Anxiety, and Stress Scale-21 (DASS-21) anxiety scale (Lovibond et al., 1995) is a 7-item measure examining general anxiety symptoms, such as autonomic and anxious arousal, situational anxiety, somatic symptoms of anxiety, and anxious affect. The rating scale for the DASS-21 is from 0 (did not apply to me at all) to 3 (applied to me very much or most of the time). Scores for the anxiety scale are

calculated by summing the scores and multiplying by two to get the final score, with higher scores demonstrating more severe anxiety and anxious arousal levels. The psychometric properties of the DASS-21 anxiety scale have been well established (Antony et al., 1998). In the current study, the DASS-21 anxiety scale demonstrated good internal consistency (Cronbach α = .84).

Depression

The Patient Health Questionnaire-9 (PHQ-9; Kroenke et al., 2001) is a 9-item self-report measure of depression symptom severity. The PHQ-9 has a rating scale of 0 (not at all) to 3 (nearly every day). Severity scores range from 0 to 27, with higher scores indicating greater depression severity. The psychometric properties of the PHQ-9 have been well established (Kroenke et al., 2001; Wittkampf et al., 2007). In the current study, the PHQ-9 demonstrated good internal consistency (Cronbach α = .88).

Anxiety

The Generalized Anxiety Disorder-7 scale (Spitzer et al., 2006) is a 7-item self-report scale assessing DSM-5 generalized anxiety criteria. Respondents are asked to rate how often they have felt anxiety symptoms within the past two weeks on a scale of 0 (not at all) to 3 (nearly every day). GAD-7 scores range from 0 to 21, with higher scores indicating increased severity of anxiety symptoms (mild >5, moderate >10, and severe > 15; Spitzer et al., 2006). The GAD-7 has demonstrated good internal consistency, and the psychometric properties have been well established (Johnson et al., 2019). In the current study, the GAD-7 demonstrated excellent internal consistency (Cronbach α = .91).

Emotion Dysregulation

The Difficulties in Emotion Regulation Short-Form (DERS-SF, Kaufman et al., 2016) is an 18-item self-report form was developed from the original 36-item DERS and has comparable concurrent validity to the original DERS (Gratz & Roemer, 2004). Participants are asked to rate how often items apply to them, ranging on a scale of 1 (almost never) to 5 (almost always), with higher scores indicating increased emotion dysregulation. The psychometric properties, including internal consistency and internal reliability for the DERS-SF, have been well established (Charak et al., 2019; Kaufman et al., 2016). In the current study, the DERS-SF demonstrated good internal consistency (Cronbach α = .85).

Data Analytic Plan and Network Visualization

In psychological network analyses, nodes refer to individual variables included in the model, while edges represent the regularized partial correlation coefficients between them. Regularized partial correlations allow for the estimation of correlations between variables while holding all other variables constant (Borsboom, 2017; Borsboom & Cramer, 2013). In network visualizations, stronger correlations are represented by thicker and darker lines, and positive correlations are shown as green lines, while negative correlations are shown as red lines. These analyses allow for the comparison of whether the nodes within these networks differ across samples, how the edges between these two specific symptoms differ between the two networks, and if the sum of the strengths of all edges in the network differs across samples. Using recommendations from Constantin (2018), sample sizes of 250 are generally enough to observe moderate sensitivity, high specificity, and high edge weights correlation when the networks are sparse and consist

of 20 nodes or less. Additionally, Van Borkulo et al. (2017) reported that comparing

networks utilizing cross-sectional and independent data were successful with a study of

10 variables with 250 observations each.

This comparative network analysis included 10 variables, so at least 500

participants were needed for analysis, 250 Veterans and 250 non-Veterans. For a list of

nodes included in this network model, please see Table 1. Due to the possibility of

missing data and validity errors, a total of 600 Veterans and non-Veterans were recruited

utilizing both the Prolific platform and social media platforms. Data were analyzed

through SPSS v.28.0 and R Version 4.1.0 and will utilize the *haven*, *qgraph*, *bootnet*,

networkcomparisontest, and *networktools* packages (Epskamp et al., 2012; 2018; van

Borkulo, 2018; Jones et al., 2018).

Table 1

Nodes and Node Acronyms Included in Network Models

Node	Measuring Scale
1. Dissociation- Depersonalization and Derealization (DpD)	Dissociative Experiences Scale -II subscale
2. Dissociation- Dissociative Amnesia (DsAm)	Dissociative Experiences Scale -II subscale
3. Dissociation- Absorption and Consumption (DsAb)	Dissociative Experiences Scale -II subscale
4. Suicidal Ideation (SIS)	Suicidal Ideation Scale
5. Posttraumatic Stress Symptoms (PCL)	PTSD Checklist for DSM-5
6. Depression Symptoms (PHQ)	Patient Health Questionnaire-9
7. Capability for Suicide – Pain Tolerance (PnT)	Acquired Capability for Suicide Scale
8. Autonomic Arousal (DAS)	Depression, Anxiety, and Stress Scale-21 anxiety arousal subscale
9. Generalized Anxiety Symptoms (GAD)	Generalized Anxiety Disorder -7
10. Emotion Dysregulation (DER)	Difficulties in Emotion Regulation Scale short form

Variables for scale and sub-scale scores are represented by nodes in network diagrams, while the connections between them are edges (Karnick et al., 2022; Smith et al., 2019). Edges between nodes represent regularized partial correlations between the variables in the model and indicate the relative strength of correlations between two nodes while holding the connections between all other nodes constant in Gaussian graphical models (GGM; Epskamp et al., 2018). Due to the large number of pairwise comparisons between variables in GGMs, smaller sample sizes may quickly become insufficient to calculate network correlations. For this reason, a least absolute shrinkage and selection operator (LASSO) procedure was used to regularize the data by using absolute parameter estimates to identify and remove irrelevant edges and develop a sparse (i.e., conservative) network (Armour et al., 2017; Epskamp et al., 2018; Tibshirani, 1996). Additionally, the LASSO technique minimizes the Estimated Bayesian Information Criterion (EBIC) to select a tuning parameter for estimating the network (Epskamp et al., 2018).

Network diagrams for each group were estimated separately using the *qgraph* package in R, and correlations were calculated using the *cor_auto* function, which automatically estimates the appropriate correlation function (i.e., polyserial, polychoric, or Pearson) for each variable in the network (Epskamp et al., 2012). A diagram output represents nodes and edges; green edges represent positive partial correlation coefficients, and red edges represent negative associations. Edge thickness represents the strength of connections between variables. Mixed graphical modeling was used to calculate the variance explained by surrounding nodes and to graphically represent these values around the border of each node in the network diagrams (Epskamp et al., 2012;

Haslbeck & Waldorp, 2020). The borders surrounding each node in network diagrams

represent the amount of variance explained by surrounding nodes.

Network Centrality and Strength Estimation

Network parameters for estimating the strength and centrality of nodes relative to

others were estimated to indicate their importance within the network. A strength

parameter was calculated for each node in the network and represented the overall weight

of a node while accounting for the weight of all connections in the network (Opsahl et al.,

2010). Additionally, closeness and betweenness parameters were estimated for each node

in the network to estimate the inverse length of paths from a node to all other nodes in the

network and the number of shortest paths that pass through a given node in the network,

respectively (Armour et al., 2017; Opsahl et al., 2010). Finally, expected influence, a

metric designed to identify highly influential nodes in psychological networks that

include negative correlations, was estimated for each network (Robinaugh et al., 2016).

Network Accuracy and Stability

Network stability and edge accuracy were assessed using the R package *bootnet*

(Epskamp et al., 2018), following previously validated procedures for network estimation

(Armour et al., 2017; Groen et al., 2019). The accuracy of edge weights was examined

using bootstrapped 95% confidence intervals (CIs) with 1000 iterations, with larger edge

weight confidence intervals indicating lower accuracy (Smith et al., 2019; Karnick et al.,

2022). Stability of centrality indices was assessed by subsetting the data and comparing

resampled stability estimates of the network with fewer observations to the original

network. This analysis yields a correlation stability coefficient (CS-stability), which is a

metric obtained from different subsets of the data that assess the stability or robustness of

correlation patterns within a network, with values recommended no lower than 0.25 and preferably higher than 0.5 (Epskamp et al., 2018). In recent studies by Epskamp et al. (2018), it was discovered that strength emerges as the most stable centrality index even when cases are removed from the dataset, while betweenness and closeness measures were found to be less reliably estimated.

Network Comparison

Finally, Veterans and non-Veterans were compared using the R package *NetworkComparisonTest* (NCT; van Borkulo et al., 2017). The NCT estimates three measures of network invariance (i.e., network structure invariance, global strength invariance, and edge invariance). Network structures were estimated using observed data from the different dissociation groups. Test statistics were calculated by comparing network differences, and permutations of the data were calculated and repeatedly rearranged to form a reference distribution. This distribution was compared to the observed test statistics for significance (van Borkulo et al., 2017).

CHAPTER III - RESULTS

Preliminary Analyses

Data Screening and Participant Selection

For the Veteran sample, 300 Veterans were initially recruited through Prolific and social media platforms. Data first were screened using current recommendations to enhance online survey data quality (Bauer et al., 2020). These methods included examining three instructional attention checks, Veteran eligibility questions for the Veteran sample, examining data outliers, and examining response time. Based on these recommendations, participants who failed one or more attention checks were removed from analysis (Bauer et al., 2020; Curran, 2016). Fifteen Veterans were removed due to failing one or more attention checks, and 12 non-Veterans were removed. Additionally, 28 Veterans were removed from the sample due to failing one or more of the three Veteran eligibility questions. Outliers were assessed using Mahalonobis's Distance in SPSS (Ghorbani, 2019). One Veteran and four non-Veterans were flagged as outliers and removed from analysis. Further examination indicated that all remaining participants' response times fell within acceptable limits ($\geq$ 600 seconds). After removing data based on these qualifications, 256 Veterans were retained for analysis. For the non-Veteran sample, 300 non-Veterans were also initially recruited through Prolific and social media platforms, and 284 non-Veterans were retained for analysis based on these qualifications. Demographic characteristics of these samples are reported in Table 2.

Table 2

Descriptive Statistics for Veterans and Non-Veterans

Demographic Characteristics	Veterans N = 256	Non-Veterans N = 284
Age		
18-24	36 (14.1%)	102 (35.9%)
25-34	136 (53.1%)	113 (39.8%)
35-44	46 (18.0%)	37 (13.0%)
45-54	26 (10.2%)	18 (6.3%)
55-64	11 (4.3%)	11 (3.9%)
65+	1 (0.4%)	3 (1.1%)
Gender		
Male	189 (73.8%)	52 (18.3%)
Female	65 (25.4%)	218 (76.8%)
Transgender/Non-binary	2 (0.8%)	14 (4.9%)
Race		
White	206 (80.5%)	228 (80.3%)
Black or African American	27 (10.5%)	24 (8.5%)
Asian	6 (2.3%)	32 (11.3%)
American Indian or Alaska Native	0 (0.0%)	12 (4.2%)
Native Hawaiian or Pacific Islander	2 (0.8%)	2 (0.7%)
Mixed Race	15 (5.9%)	9 (3.2%)
Sexual Orientation		
Heterosexual (straight)	218 (84.4%)	181 (63.7%)
Homosexual (gay)	8 (3.1%)	15 (5.3%)
Bisexual	17 (6.6%)	69 (24.3%)
Prefer Not to Say	15 (5.9%)	19 (6.7%)
Branch		
Army	82 (32.0%)	--
Navy	54 (21.1%)	--
Air Force	60 (23.4%)	--
Marines	30 (11.7%)	--
Coast Guard	7 (2.7%)	--
National Guard/Reserves	23 (9.0%)	--
Past Year Suicidal Ideation		
Yes	89 (34.8%)	87 (30.6%)
No	154 (60.2%)	179 (63.0%)
Prefer Not to Say	13 (5.1%)	18 (6.3%)
Past Year Suicide Attempt		
Yes	41 (16.0%)	14 (4.9%)
No	209 (81.6%)	260 (91.5%)
Prefer Not to Say	6 (2.3%)	10 (3.5%)

Additionally, data were screened for missing data. Missing data in these samples ranged from 0.4% (SIS) to 5.4% (PCL-5). Due to some main study variables having over 5% of missing data, missing data were handled in R with the *mice* package by implementing multiple imputation through predictive means matching (Buuren, 2020; Buuren & Groothuis-Oudshoorn, 2011; Jakobsen et al., 2017; van Buuren et al., 1999). Predictive means matching is a simulation-based technique shown to be a valid method for handling missing data by imputing missing values using the observed values of similar cases in the dataset. This method identifies a small set of candidate donors (typically with 5 to 10 members) that are comparable to the case with the missing value based on other available variables and calculates the mean of those values. This mean value is then used to impute the missing value (van Buuren, 2018).

Finally, variables included in the analyses were screened for normality, including skewness and kurtosis. Suicidal ideation, the depersonalization and derealization subfactor, and the dissociative amnesia subfactor evidenced potentially problematic levels of skewness and kurtosis. However, data were not transformed because similar non-normal distributions would be expected in the general population for these variables and have been seen in prior studies (e.g., Caulfield et al., 2021; Mazzotti et al., 2016). Instead, violations of normality were considered when running analyses, and alternative tests to account for non-normality were utilized. Additionally, the R packages utilized for the network analyses automatically transforms non-normal data to approximate a parametric distribution prior to generating the networks (Epskamp et al., 2012; 2018; van Borkulo, 2018).

Examining Participants Recruited from Prolific and Social Media

Given the different methods utilized to recruit participants for these two samples, differences between participants recruited through Prolific versus social media were analyzed further. For the Veteran sample, 71 participants (27.7%) were recruited through the Prolific platform, and 185 participants (72.3%) were recruited through social media. Crosstabulations indicated that most Veterans recruited through the Prolific platform were between 25 to 34 years old (59.2%), identified as male (78.9%), Caucasian (87.3%), and heterosexual (87.3%). Additionally, these participants were most likely to report having been in the Air Force (43.7%), having some college but no college degree (31%), and not owning a firearm (53.5%). Further, 21.1% reported past year thoughts of suicide, and 2.1% reported a past year suicide attempt. Veteran participants recruited through social media were also mainly between 25 to 34 years old (50.8%), male (71.9%), Caucasian (77.8%), and heterosexual (83.2%). However, Veterans recruited through social media were more likely to report having been in the Army (33.0%), having a college degree (41.6%), and owning a firearm (64.3%). They were also more likely to report past year thoughts of suicide (40.0%) and a past year suicide attempt (21.1%).

Additionally, given the unequal sample sizes and variances, Welch's t-tests were conducted to compare the mean scores of main study variables between Veterans recruited from the Prolific platform and Veterans recruited through social media platforms (Welch, 1947; Zimmerman, 2004). Results of the Welch's t-test indicated that Veterans recruited from social media reported significantly higher depersonalization and derealization, dissociative amnesia, suicidal ideation, posttraumatic stress symptoms, anxious arousal, depression, and anxiety with effect sizes, as measured by *Hedges' g*

correction, between small and medium. Results and effect sizes are further summarized in Table 3A.

For the non-Veteran sample, 240 participants (84.5%) were recruited through the Prolific platform, and 44 participants (15.5%) were recruited through social media. Crosstabulations indicated that most non-Veterans recruited through the Prolific platform were between 18 to 24 years old (38.8%), identified as female (83.3%), Caucasian (72.4%), and heterosexual (60.4%). Additionally, most participants reported having a college degree (40.0%) and not owning a firearm (87.5%). Further, 30.8% reported past year thoughts of suicide, and 2.1% reported a past year suicide attempt. Most non-Veteran participants recruited through social media were between 25 to 34 years old (56.8%), identified as male (56.8%), Caucasian (77.3%), and heterosexual (81.8%). Also, most non-Veterans recruited through social media reported having a college degree (52.3%), not owning a firearm (75.0%). Non-Veteran's recruited through social media were not more likely to report past year thoughts of suicide (29.5%) but were more likely to report a past year suicide attempt (20.5%) than non-Veterans recruited through the Prolific platform.

As with the Veteran sample, given the unequal sample sizes and variances, Welch's t-tests were conducted to compare the mean scores of main study variables between non-Veterans recruited from the Prolific platform and non-Veterans recruited through social media (Welch, 1947; Zimmerman, 2004). Results of the Welch's t-tests indicated that non-Veterans recruited from social media reported significantly higher depersonalization and derealization, dissociative amnesia, suicidal ideation, posttraumatic stress symptoms, anxious arousal, depression, and anxiety with effect sizes, as measured

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by *Hedges' g* correction, between medium to large. Results and effect sizes are further summarized in Table 3B.

Table 3

Welch's t-tests comparing mean scores of main study variables between Prolific and Social Media subgroups in Veterans (A) and Non-Veterans (B)[1]

A	Prolific N = 71		Social Media N = 185					
	M	SD	M	SD	*t*	*df*	*p* value	*Hedges' g*
DpD	**12.0**	**9.5**	**19.4**	**13.1**	**-4.97**	**173.6**	**<.001**	**-.66**
DsAm	**11.0**	**6.5**	**18.4**	**12.5**	**-6.15**	**231.3**	**<.001**	**-.60**
DsAb	22.5	11.3	22.5	11.8	-1.24	132.1	.218	-.17
SIS	**14.2**	**7.5**	**19.5**	**9.4**	**-4.74**	**159.1**	**<.001**	**-.60**
PCL	**41.8**	**19.5**	**51.0**	**17.3**	**-3.37**	**109.1**	**.001**	**-.51**
PHQ	**8.4**	**6.8**	**10.6**	**6.2**	**-2.34**	**117.0**	**.021**	**-.34**
PnT	3.3	1.3	3.3	1.4	0.39	129.9	.695	.05
DAS	**17.9**	**8.7**	**23.3**	**9.5**	**-4.34**	**138.6**	**<.001**	**-.58**
GAD	**13.8**	**5.6**	**17.9**	**8.7**	**-2.23**	**122.5**	**.028**	**-.32**
DER	44.5	12.7	46.2	11.3	-0.96	107.6	.340	-.15
B	Prolific N = 240		Social Media N = 44					
	M	SD	M	SD	*t*	*df*	*p* value	*Hedges' g*
DpD	**13.4**	**9.7**	**21.7**	**14.3**	**-3.70**	**50.5**	**<.001**	**-.79**
DsAm	**10.3**	**6.3**	**19.9**	**13.3**	**-4.68**	**46.5**	**<.001**	**-1.23**
DsAb	22.7	11.6	24.5	13.1	-1.02	56.2	.312	-.18
SIS	**15.5**	**7.6**	**19.9**	**9.2**	**-3.07**	**54.4**	**.003**	**-.57**
PCL	**42.0**	**16.5**	**54.1**	**17.0**	**-4.07**	**47.2**	**<.001**	**-.73**
PHQ	**9.6**	**6.2**	**12.4**	**5.2**	**-3.16**	**67.3**	**.002**	**-.46**
PnT	**2.2**	**1.2**	**2.9**	**1.2**	**-3.66**	**61.3**	**<.001**	**-.58**
DAS	**18.6**	**8.5**	**25.4**	**8.1**	**-5.02**	**67.3**	**.002**	**-.80**

Table 3 Continued

GAD	15.4	5.7	16.7	4.3	-1.69	74.3	.095	-.23
DER	48.5	10.5	50.1	11.4	-0.81	50.6	.420	-.15

1 DpD= Dissociative Experiences Scale-II Depersonalization and Derealization subscale, DsAm= Dissociative Experiences Scale-II Amnesia subscale, DsAb= Dissociative Experiences Scale-II Absorption and Consumption Subscale, SIS=Suicide Ideation Scale, , PCL=Posttraumatic Checklist-5, , PHQ= Patient Health Questionnaire-9, PnT= Acquired Capability for Suicide Pain Tolerance Question, DAS=Depression, Anxiety, and Stress Scale-21 autonomic arousal subscale, GAD = Generalized Anxiety Disorder-7, DER=Difficulties in Emotion Regulation Scale.

Primary Analyses

Independent t-tests were conducted to compare the mean scores of main study variables between Veterans and non-Veterans. Levene's test indicated a significant difference in variances between Veterans and non-Veterans for the dissociation depersonalization and derealization subfactor ($F(1, 538) = 8.72$, $p = .003$), dissociative amnesia subfactor ($F(1, 538) = 40.84$, $p < .001$), suicidal ideation ($F(1, 538) = 12.21$, $p < .001$), anxious arousal ($F(1, 538) = 8.03$, $p = .005$), and pain tolerance ($F(1, 538) = 5.82$, $p = .016$). Welch's t-tests were utilized for these variables, which assumes unequal variances (Welch, 1947). Results of the independent t-tests and Welch's t-test indicated that compared to non-Veterans, Veterans reported significantly higher self-reported symptoms of depersonalization and derealization, dissociative amnesia, suicidal ideation, posttraumatic stress symptoms, anxious arousal, and pain tolerance. However, non-Veterans reported significantly higher scores on a measure of emotion dysregulation compared to Veterans. There were no significant differences found between Veterans' and non-Veterans' self-reported scores on measures examining dissociative absorption and consumption, depression, and generalized anxiety symptoms. The effect sizes, as

measured by Cohen's *d*, were between small to medium. Results and effect sizes are

further summarized in Table 4.

Table 4

Independent samples t-tests comparing mean scores of main study variables between

Veterans and Non-Veterans.[1]

	Veterans		Non-Veterans				
	M	SD	M	SD	t	df	*p value*
DpD*	**17.3**	**12.6**	**14.7**	**10.9**	**2.61**	**533.9**	**.009**
DsAm*	**16.3**	**11.6**	**11.8**	**8.5**	**5.16**	**462.4**	**<.001**
DsAb	23.9	11.7	22.7	11.9	1.18	538	.240
SIS*	**18.0**	**9.2**	**16.1**	**8.0**	**2.51**	**504.9**	**.012**
PCL	**48.4**	**18.4**	**43.6**	**17.1**	**3.05**	**538**	**.002**
PHQ	10.0	6.3	10.0	6.1	.014	538	.989
PnT*	**3.3**	**1.4**	**2.4**	**1.3**	**8.07**	**515.6**	**<.001**
DAS*	**21.8**	**9.6**	**19.7**	**8.7**	**2.66**	**518.3**	**.008**
GAD	15.1	5.5	15.6	5.5	-1.15	538	.251
DER	**45.7**	**11.7**	**48.8**	**10.6**	**-3.13**	**538**	**.002**

[1] DpD= Dissociative Experiences Scale-II Depersonalization and Derealization subscale, DsAm= Dissociative Experiences Scale-II

Amnesia subscale, DsAb= Dissociative Experiences Scale-II Absorption and Consumption Subscale, SIS=Suicide Ideation Scale, ,

PCL=Posttraumatic Checklist-5, , PHQ= Patient Health Questionnaire-9, PnT= Acquired Capability for Suicide Pain Tolerance

Question, DAS=Depression, Anxiety, and Stress Scale-21 autonomic arousal subscale, GAD = Generalized Anxiety Disorder-7,

DER=Difficulties in Emotion Regulation Scale.

* Levene's Test for Equality of Variance was significant, and Welch's t statistics were reported for equal variances not assumed.

Exploratory Analyses

Network Structure and Estimation

The network structure for the Veteran and non-Veteran sample were generated

(Figure 1) along with degree centrality statistics (Figure 2). Bootstrapped edge weights

approximated the original sample in both networks with moderate confidence intervals,

indicating relative network stability (Figure 3). Additionally, the correlation between the

subsetted data of both networks was well correlated to the original data (Figure 4). These

results suggest that for both the Veteran and non-Veteran network, strength and expected

influence were the most stable statistic compared to betweenness and closeness.

Figure 1.
Network Structure for Veterans (Panel A) and Non-Veterans (Panel B)[1]

A.

B.
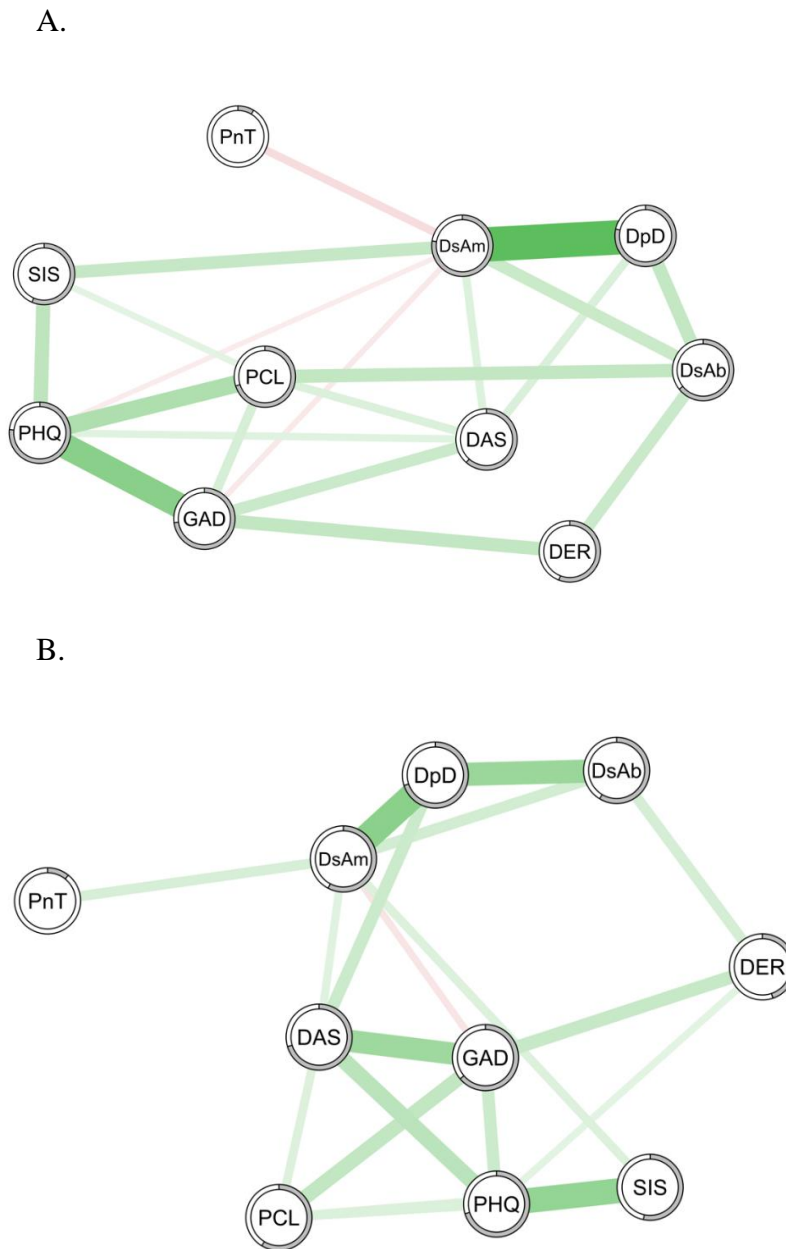
Figure 2.
Plots comparing strength, betweenness, closeness, and expected influence centrality estimates for Veterans (Panel A) and Non-Veterans (Panel B)[1]

A.
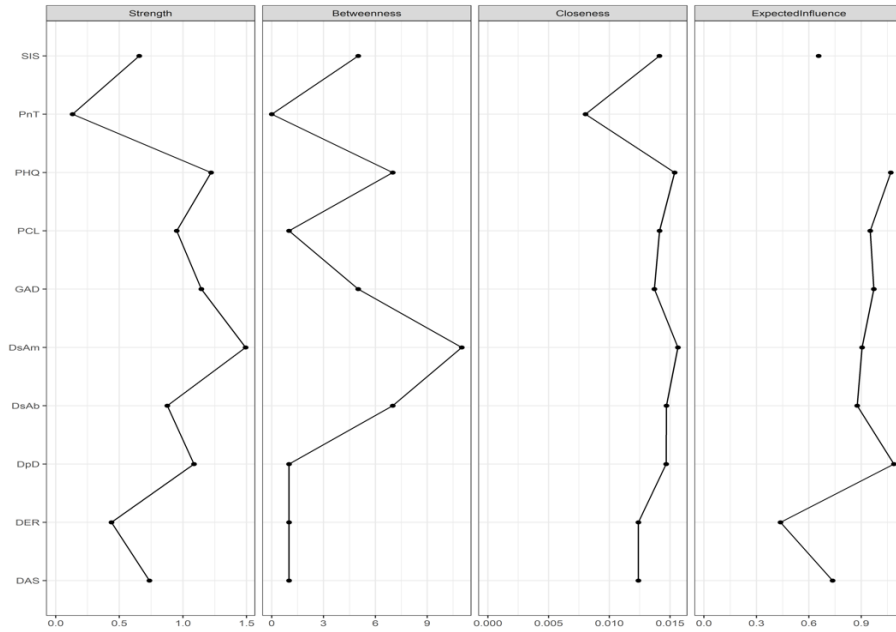
B.
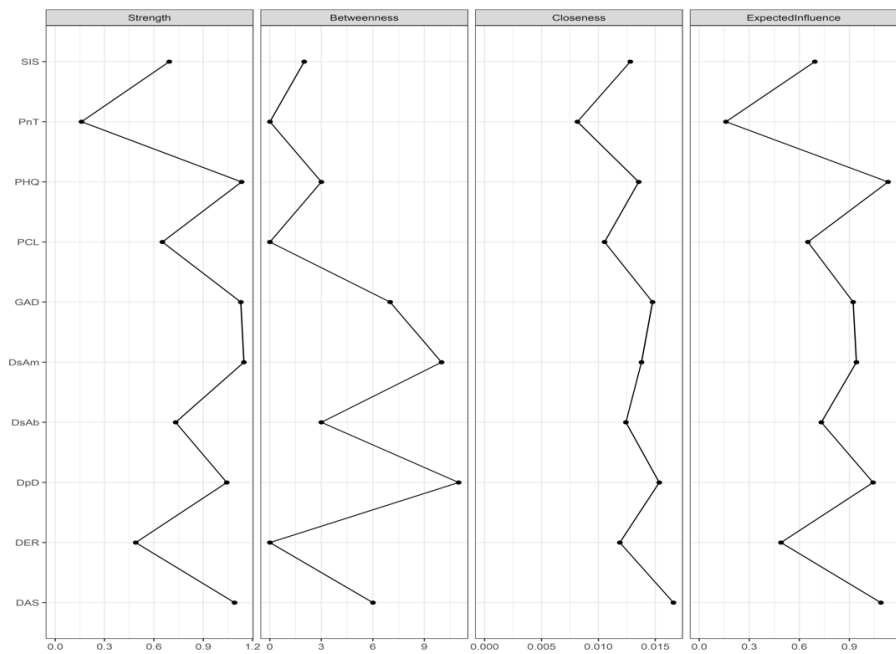
Figure 3.
Bootstrapped CIs and edge weights for Veterans (A) and Non-Veterans (B)

A.
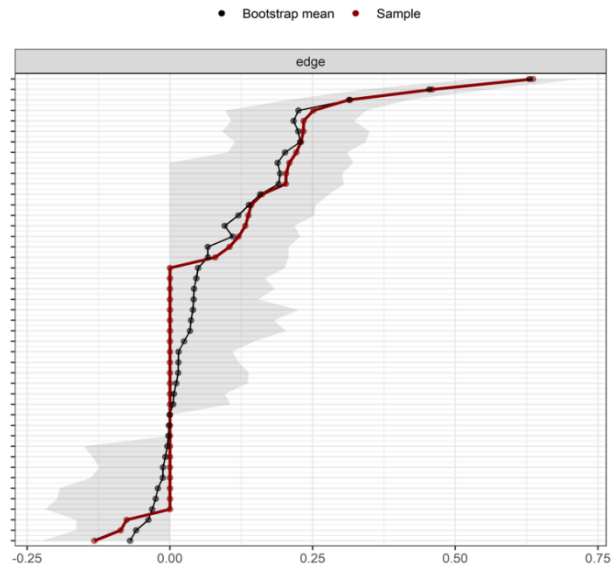
B.
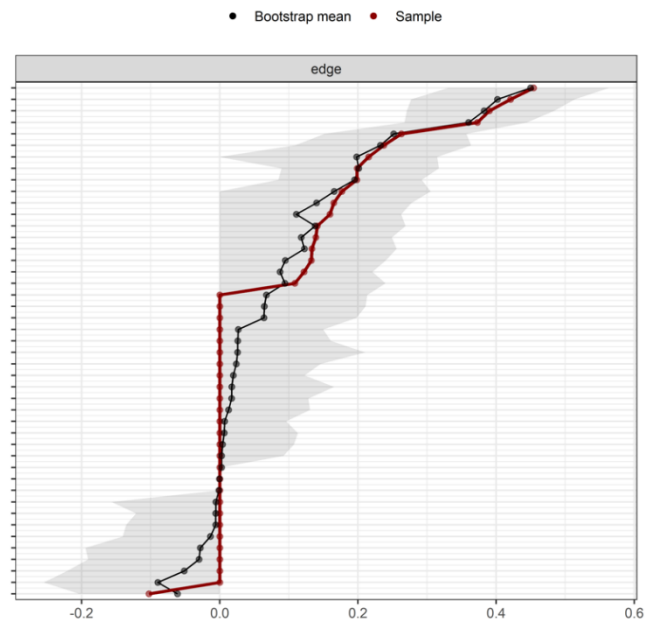
Figure 4.
Subsetting bootstrap for Veterans network (A) and Non-Veterans network (B)
demonstrating average centrality estimates for original networks relative to subsetted
estimates with fewer samples

A.
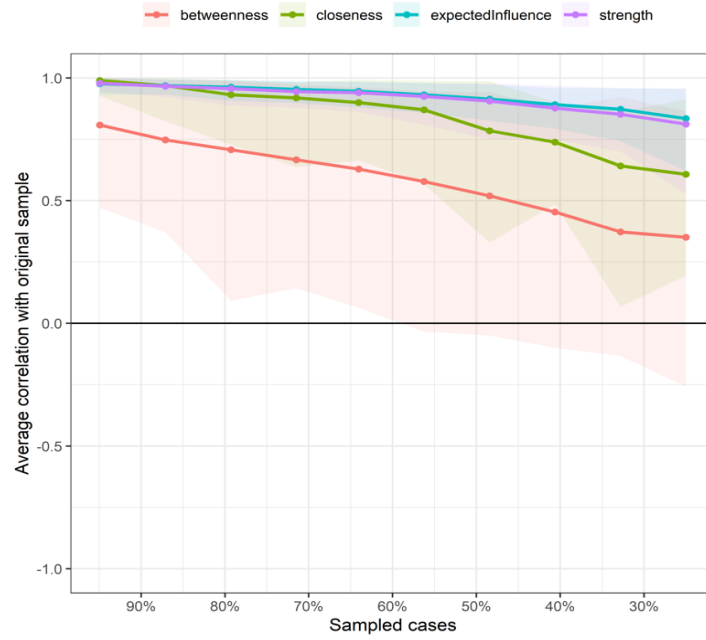
B.
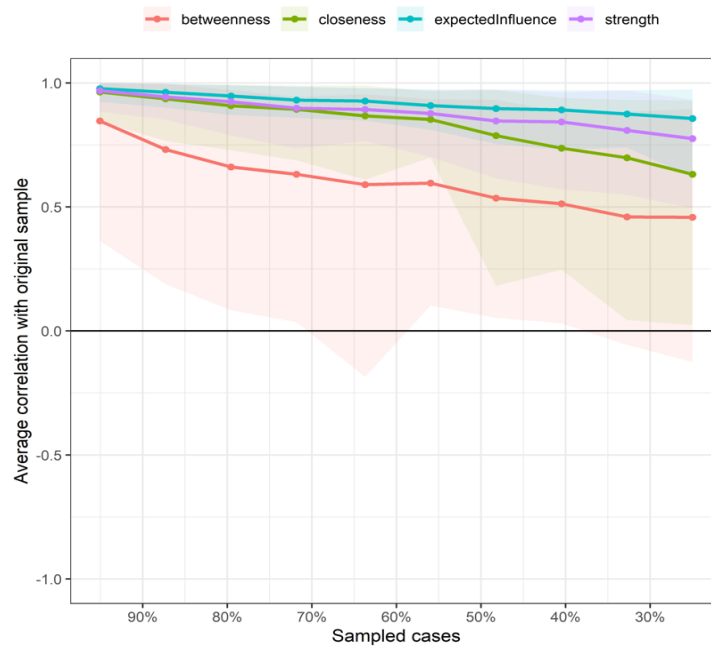
Indeed, the CS-stability coefficients for the Veteran sample were 0.2 for betweenness, 0.05 for closeness, 0.75 for expected influence, and 0.67 for strength. For the non-Veteran network, the CS-stability coefficients were 0.05 for betweenness, 0.05 for closeness, 0.67 for expected influence, and 0.52 for strength. Both samples had expected influence and strength CS-stability coefficients above 0.5, indicating that subsetting bootstraps for these metrics were highly correlated to their original networks; therefore, these measures were retained for further analysis. Centrality data statistics were further reported in Table 5.

Table 5

Centrality data statistics for study variables in Veterans and Non-Veterans[1]

	Veterans				Non-Veterans			
Node	Betweenness	Closeness	Expected Influence	Strength	Betweenness	Closeness	Expected Influence	Strength
DpD	1.00	0.01	**1.09**	1.09	11.00	0.02	1.04	1.04
DsAm	11.00	0.02	0.90	**1.49**	10.00	0.01	0.94	**1.15**
DsAb	7.00	0.01	0.88	0.88	3.00	0.01	0.73	0.73
SIS	5.00	0.01	0.66	0.66	2.00	0.01	0.69	0.69
PCL	1.00	0.01	0.95	0.95	0.00	0.01	0.65	0.65
PHQ	7.00	0.02	**1.07**	**1.22**	3.00	0.01	**1.13**	**1.13**
PnT	0.00	0.01	-0.13	0.13	0.00	0.01	0.16	0.16
DAS	1.00	0.01	0.74	0.74	6.00	0.02	**1.09**	1.09
GAD	5.00	0.01	0.97	**1.14**	7.00	0.01	0.92	**1.13**
DER	1.00	0.01	0.44	0.44	0.00	0.01	0.49	0.49

[1] DpD= Dissociative Experiences Scale-II Depersonalization and Derealization subscale, DsAm= Dissociative Experiences Scale-II Amnesia subscale, DsAb= Dissociative Experiences Scale-II Absorption and Consumption Subscale, SIS=Suicide Ideation Scale, , PCL=Posttraumatic Checklist-5, , PHQ= Patient Health Questionnaire-9, PnT= Acquired Capability for Suicide Pain Tolerance Question, DAS=Depression, Anxiety, and Stress Scale-21 autonomic arousal subscale, GAD = Generalized Anxiety Disorder-7, DER=Difficulties in Emotion Regulation Scale.

Veterans Network

The network structure for the Veterans sample can be seen in Figure 1A. Regarding general strength, dissociative amnesia (strength: 1.49), depressive symptoms (strength: 1.22), and generalized anxiety (strength: 1.14) were found to have the most overall weight within this network. However, when accounting for negative edges, depersonalization and derealization (EI: 1.09) and depression symptoms (EI: 1.07) were most central to the network. Additionally, the strongest correlations were found between dissociative amnesia and dissociative depersonalization and derealization, depression and anxiety symptoms, depression symptoms and suicidal ideation, dissociative amnesia and suicidal ideation, and depression symptoms and posttraumatic stress symptoms. Furthermore, there was a negative association between dissociative amnesia and depression symptoms, generalized anxiety symptoms, and pain tolerance. In this network, suicidal ideation was associated with depression symptoms, dissociative amnesia, and posttraumatic stress symptoms. Additional plots comparing strength, betweenness, closeness, and expected influence centrality estimates for non-Veterans can be found in Figure 2A.

Non-Veteran Network

The network structure for the non-Veteran sample can be seen in Figure 1B. Regarding general strength, dissociative amnesia (strength: 1.15), depressive symptoms (strength: 1.13), and generalized anxiety (strength: 1.13) were found to have the most overall weight within this network. However, depression symptoms (EI: 1.13) and anxious arousal (EI: 1.09) were most central to the network. The strongest correlations were found between dissociative amnesia and depersonalization and derealization,

depersonalization and derealization and absorption and consumption, depression

symptoms and suicidal ideation, anxious arousal and generalized anxiety symptoms, and

dissociative amnesia and suicidal ideation. In this sample, suicidal ideation was

associated with dissociative amnesia and depressive symptoms but not posttraumatic

stress symptoms. Plots comparing strength, betweenness, closeness, and expected

influence centrality estimates for non-Veterans can be found in Figure 2B.

Network Comparison Test

Overall, network invariance testing indicated no significant differences in the

network structures between Veterans and non-Veterans ($p = .05$). Additionally, global

strength invariance testing indicated no significant differences between the two networks

in node strength ($p = .602$). Finally, edge invariance testing was used to detect differences

in edge strength between the two networks. Results showed there were significant edge

differences found between these two samples. In particular, there was a positive

correlation between the dissociative amnesia node and pain tolerance node in non-

Veteran compared to the Veterans sample, which had a negative correlation. Summaries

of all edge invariance testing results are shown in Table 6. Additionally, plot comparisons

between Veterans and non-Veterans can be seen in Figure 5.

Table 6

Edge Invariance Tests

Edges	p value	Edges	p value
DpD – DsAm*	0.165	DsAb – GAD	1.000
DpD – DsAb	0.382	PnT – GAD	1.000
DsAm – DsAb	1.000	SIS – GAD	1.000
DpD – PnT	1.000	PCL – GAD	1.000
DsAm – PnT	**<.001****	DERS – GAD	1.000
DsAb – PnT	1.000	DpD – DAS	1.000
DpD – SIS	1.000	DsAm – DAS	0.315
DsAm – SIS	1.000	DsAb – DAS	1.000
DsAb – SIS	1.000	PnT – DAS	1.000
PnT – SIS	1.000	SIS – DAS	1.000
DpD – PCL	1.000	PCL – DAS	1.000
DsAm – PCL	1.000	DER – DAS	1.000
DsAb – PCL	0.382	GAD – DAS	0.202
PnT – PCL	1.000	DpD – PHQ	1.000
SIS – PCL	1.000	DsAm – PHQ	1.000
DpD – DERS	1.000	DsAb – PHQ	1.000
DsAm – DERS	1.000	PnT – PHQ	1.000
DsAb – DERS	1.000	SIS – PHQ	0.386
PnT – DERS	1.000	PCL – PHQ	0.386
SIS – DERS	1.000	DER – PHQ	1.000
PCL – DERS	1.000	GAD – PHQ	0.450
DpD – GAD	1.000	DAS – PHQ	0.395
DsAm – GAD	1.000		

[1] DpD= Dissociative Experiences Scale-II Depersonalization and Derealization subscale, DsAm= Dissociative Experiences Scale-II Amnesia subscale, DsAb= Dissociative Experiences Scale-II Absorption and Consumption Subscale, SIS=Suicide Ideation Scale, , PCL=Posttraumatic Checklist-5, , PHQ= Patient Health Questionnaire-9, PnT= Acquired Capability for Suicide Pain Tolerance Question, DAS=Depression, Anxiety, and Stress Scale-21 autonomic arousal subscale, GAD = Generalized Anxiety Disorder-7, DER=Difficulties in Emotion Regulation Scale.

Figure 5.
Centrality comparison plots for Veterans and Non-Veterans[1]
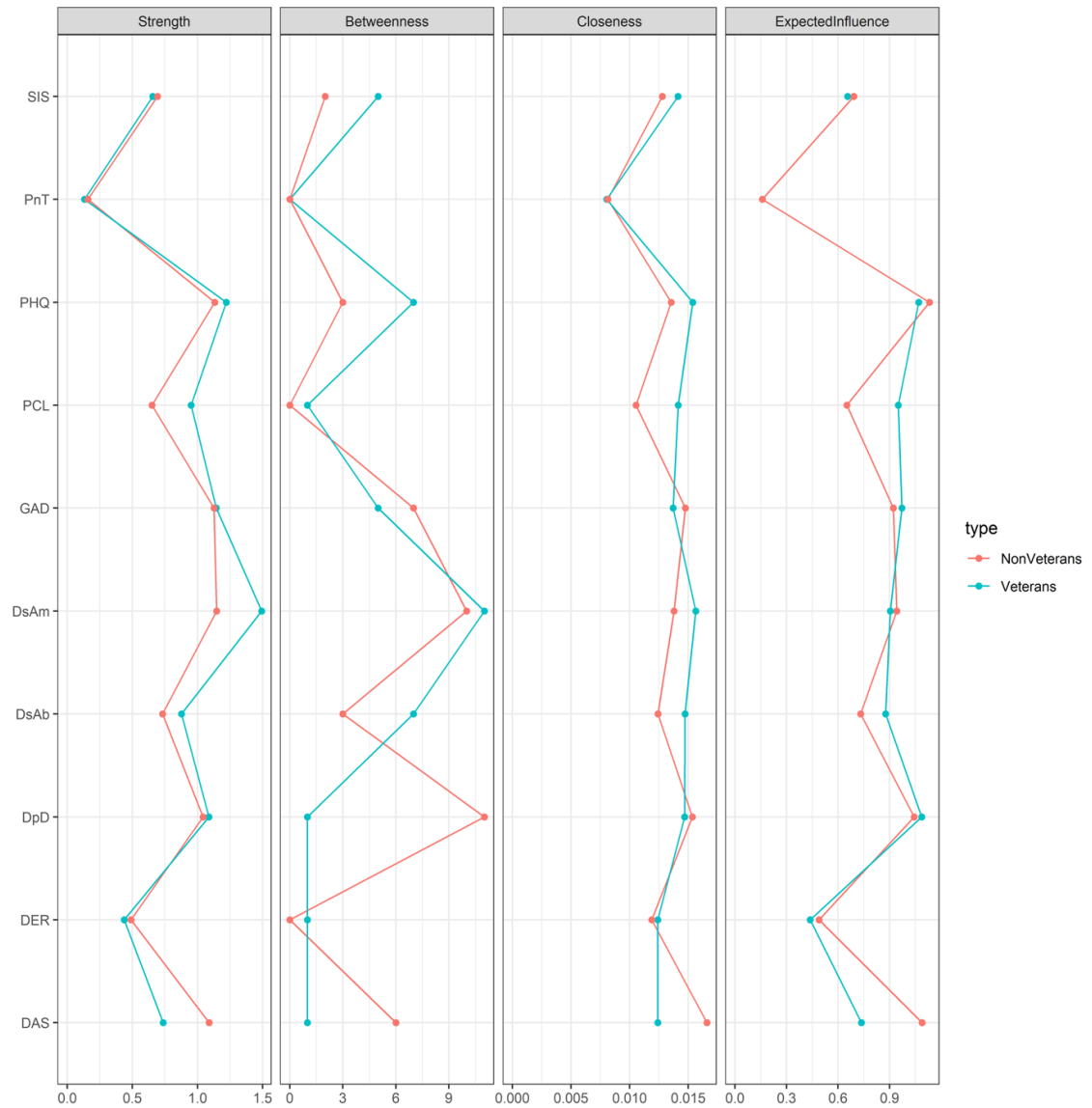
1 DpD= Dissociative Experiences Scale-II Depersonalization and Derealization subscale, DsAm= Dissociative Experiences Scale-II Amnesia subscale, DsAb= Dissociative Experiences Scale-II Absorption and Consumption Subscale, SIS=Suicide Ideation Scale, , PCL=Posttraumatic Checklist-5, , PHQ= Patient Health Questionnaire-9, PnT= Acquired Capability for Suicide Pain Tolerance Question, DAS=Depression, Anxiety, and Stress Scale-21 autonomic arousal subscale, GAD = Generalized Anxiety Disorder-7, DER=Difficulties in Emotion Regulation Scale.

CHAPTER IV - DISCUSSION

The current study aimed to explicate the complex relationship between dissociation subtypes, suicide, and relevant covariates in a sample of military Veterans and non-Veterans. The hypothesis that Veterans would have significantly higher scores than non-Veterans on measures of dissociation facets, suicidal ideation, and comorbidity measures (i.e., depression, generalized anxiety, anxious arousal, PTSD, pain tolerance, emotion dysregulation) was partially supported. Consistent with our hypotheses, results indicated that Veterans reported significantly higher levels of depersonalization and derealization, dissociative amnesia, suicidal ideation, posttraumatic stress symptoms, anxious arousal, and pain tolerance than non-Veterans. These findings are in line with previous studies that consistently found higher levels of dissociative symptoms, particularly depersonalization and derealization symptoms (Boyd et al., 2018; Herzog et al., 2020) and dissociative amnesia symptoms (Nejad, 2007) among Veterans compared to non-Veterans. Research has also indicated that Veterans consistently score higher on measures of posttraumatic stress and have higher rates of PTSD than civilians (Creamer & Forbes, 2004; Lehavot et al., 2018; Wisco et al., 2014). Veterans also reported significantly higher pain tolerance than non-Veterans, which is also consistent with research indicating that exposure to stressful and traumatic events, especially combat-related exposure, can lead to increased pain tolerance (Tesarz et al., 2020). The effect sizes, as measured by Cohen's *d*, were small to medium for the significant differences found in this study, indicating that the differences between Veterans and non-Veterans are not large, but are still meaningful (Cohen, 1988).

However, there were no significant differences between Veterans and non-Veterans in self-reported mean scores of dissociative absorption and consumption, depression symptoms, and generalized anxiety symptoms. It is possible that the dissociative absorption and consumption factor was not significantly higher in the Veteran population because this subfactor reflects more non-pathological aspects of dissociation that are more common in the general population, such as daydreaming or imaginal involvement (Maaranen et al., 2005). Interestingly, while there was a significant difference between Veterans and non-Veterans looking at self-reported anxious arousal, there were no significant differences found when examining generalized anxiety symptoms or depression symptoms. This is inconsistent with some previous studies that found higher levels of anxiety and depression symptoms among Veterans (Lazar, 2014; Schult et al., 2019), but consistent with others that found no differences in these symptoms between Veterans and civilians (Gould et al., 2015), or higher symptoms of general anxiety and depression only in a women Veteran population (Grossbard et al., 2013).

Finally, contrary to our hypothesis, results indicated significantly higher self-reported symptoms of emotion dysregulation in the non-Veteran sample compared to the Veteran sample. One reason for this may be that highly trauma-exposed individuals, such as military Veterans, may have ineffective emotion regulation but also may have difficulty defining the consequences of their emotions or show avoidance of internal emotions when filling out self-report measures (Monson et al., 2004). Alternatively, prior researchers have posited that Veterans may be better able to regulate their emotions due to their history of working in high-stress situations and being in environments that elicit

continued intense negative emotions (Berking et al., 2010; Stanley & Larsen, 2019). For service members, regulating their emotions is protective and vital for their survival, as emotion dysregulation may adversely affect their ability to make quick and complicated life-or-death decisions while on duty (Stanley & Larsen, 2019).

Discussion of Exploratory Results

The exploratory results provide insight into the symptom network structures of Veterans and non-Veterans. The network structures for both groups were relatively stable, and centrality stability coefficients indicated that strength and expected influence were the most stable statistics compared to betweenness and closeness for both the Veteran and non-Veteran network. Moreover, the strength centrality data statistics revealed that dissociative amnesia (DsAm), depressive symptoms (PHQ), and generalized anxiety (GAD) were the most central symptoms in both networks, suggesting that addressing these symptoms may have broad effects on overall symptomatology for Veterans and non-Veterans.

However, there appear to be some differences in the relative expected influence of nodes on the model in Veterans compared to non-Veterans. In particular, depersonalization and derealization (DpD), followed by depression symptoms (PHQ), were most influential to the Veteran network. In contrast, depression symptoms (PHQ), followed by anxious arousal (DAS), were most influential to the non-Veteran network. As discussed above, prior literature would support depersonalization and derealization being highly influential in Veteran samples. Veterans are more likely to experience higher dissociation rates than non-Veterans because they are more likely to be exposed to traumatic events both while in the military and childhood, and Veterans are also more

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likely to be diagnosed with the dissociative subtype of PTSD than the general population (Özdemir et al., 2015). Additionally, this supports the idea that dissociation, particularly depersonalization and derealization, is a transdiagnostic factor that influences the development and maintenance of a diverse range of related psychopathology.

Unsurprisingly, depression was a highly influential node in both the Veteran and non-Veteran networks. Indeed, depression is one of the most common mental health disorders cited by both Veterans (Inoue et al., 2021) and non-Veterans (*National Institute of Mental Health, 2020*) and is recognized by the World Health Organization as a significant contributor to the overall burden of mental and physical disease (Arnaud et al., 2022; Thaipisuttikul et al., 2014). Anxious arousal was the second most influential node in the non-Veteran sample. Our measure of anxious arousal included questions about the physiological effects of anxiety and panic (e.g., I am aware of the action of my heart in the absence of physical exertion; I felt I was close to panic). There is a well-established connection between depression and anxiety disorders, and up to 67% of individuals diagnosed with unipolar depression also meet the criteria for at least one comorbid anxiety disorder (Kessler et al., 2005; Kessler et al., 2015). Additionally, anxious arousal has been shown to be associated with the development of an anxiety disorder, as well as overall psychiatric comorbidity and lower quality of life (Hendriks et al., 2014; Kemp et al., 2012).

Suicidal ideation was not found to be central to either model, which was expected given the lower prevelance rates of suicide compared with the higher prevalence of comorbid disorders included in these networks. However, it is useful to examine nodes and edges that were associated with suicide in both of these network models. In the

Veteran model, depression, PTSD symptoms, and dissociative amnesia were associated with suicidal ideation, while in the non-Veteran model, suicidal ideation was also directly correlated to depression and dissociative amnesia but not PTSD symptoms. Depression has been a highly cited correlate of suicidal ideation in suicide literature in both Veterans and non-Veterans (Cai et al., 2021). As for why PTSD may have been directly related to suicidal ideation in Veterans but not non-Veterans, researchers posit that one reason the suicide rate is higher in Veterans than non-Veterans is due to higher exposure to trauma and increased presence of PTSD symptoms in the Veteran population (Guerra et al., 2011; Lemaire & Graham, 2011; McCue et al., 2022).

However, it was interesting to see dissociative amnesia's correlation with suicidal ideation, instead of dissociative depersonalization and derealization, which has previously been found to be a correlate of suicidal ideation when compared to other dissociative subtypes (Caulfield et al., 2021; Levinger et al., 2015). Research examining the association between dissociative subtypes and suicidal ideation is still limited. Enduring childhood trauma might partially explain this associaion (Bertule et al., 2021). For example, a study by Sar et al. (2007) found that patients who experienced higher rates of dissociative amnesia were more likely to report childhood emotional, physical, or sexual abuse and had higher rates of suicidal ideation and suicide attempts than healthy controls. Indeed, while our study did not specify a timeline of trauma exposure, extant literature has found that Veteran personnel have higher rates of adverse childhood experiences than civilians (Blosnich et al., 2014; Laird & Alexander, 2019; McCauley et al., 2015; Stein et al., 2018). Additionally, our non-Veteran sample was found to have a lower income bracket than the general US population (52% had incomes <$50,000; 30%

had incomes <$25,000; Mitchell, 2020), which has also been associated with higher rates of enduring childhood adversity than the general US population (Giovanelli et al., 2016; Walsh et al., 2019). In the DSM-5, PTSD has two criteria that are considered dissociative in nature, Criterion B.3, dissociative flashbacks, and Criterion D.1, or inability to recall important aspects of the trauma (due to dissociative amnesia and not other factors; APA, 2013), and given PTSD's robust relationship with suicidal ideation, this may also partially explain this relationship. However, a study by Armour et al. (2017), which examined PTSD symptoms and correlates of PTSD, including suicidal ideation, did not find the above specified PTSD criteria to be correlated with suicidal ideation.

Another possibility is that depersonalization and derealization may be more related to suicide behaviors over and above suicidal ideation. Indeed, prior researchers have posited that dissociation may be a facilitator from suicidal ideation to suicide attempt (Caulfield et al., 2021; Orbach, 2003). Theories explaining the relationship between dissociation and suicide posit that repeated dissociation creates an insensitivity to pain and indifference to the body, rendering a suicidal act more possible (Orbach, 2003). This distinction between suicidal ideation and attempt is essential, as a majority of those who ideate do not go on to attempt suicide (Klonsky et al., 2021). Future research should also include networks that separate suicidal ideation and past suicide attempts to differentiate predictors of suicidal behaviors (Klonsky et al., 2021). Additionally, future research should continue to examine the relationship between dissociative amnesia and suicide further.

Network comparison results indicated no significant differences in the network structures between Veterans and non-Veterans and no significant differences between the

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two networks in node strength. However, the edge invariance testing showed that there were significant differences in edge strength between the two networks, suggesting that the networks for Veterans and non-Veterans were not entirely equivalent. Namely, there was a positive correlation between the dissociative amnesia node (DsAm) and pain tolerance node (PnT) in the non-Veteran network, which had a negative correlation in the Veterans network. Dissociation has been theorized to lead to insensitivity to pain, and increased dissociation has been positively associated with higher pain tolerance in individuals with borderline personality disorder (Bekrater-Bodmann et al., 2015). Nevertheless, other studies have found opposite results. For example, Horowitz & Telch (2007) found that participant self-reports of pain actually increased after engaging in a dissociative induction task. Additionally, Pachkowski et al. (2021) found that self-reported dissociation scores were unrelated to a behavioral pain tolerance task. It is possible that there may be no direct positive association between dissociation and pain tolerance, but instead, they may share similar pathways to trauma responses, such as hyperarousal. For example, dissociation has been cited to be a direct response to hyperarousal, and hyperarousal may also be related to pain tolerance (Horowitz & Telch, 2007).

Although, it may also be likely that factors that influence capability for suicide, such as pain tolerance, are dynamic and state-dependent and may fluctuate depending on the participant's current level of suicide risk (Caulfield et al., 2022; Law & Anestis, 2021). Of note, these mixed findings may be further complicated due to our measure of pain tolerance being only one item, which may have limited variance and contributed to these conflicting results. While prior research has indicated this item has been

successfully utilized to measure capability-related pain tolerance in the past (Franklin et al., 2011), future studies should consider using more comprehensive measures of pain tolerance. Additionally, future research should consider including both self-report and laboratory measures of pain tolerance to examine fluctuations in pain tolerance and capability for suicide.

Strengths and Limitations

This study had several methodological strengths. For one, intensive screening methods were used to enhance the quality of online survey data, and participants were recruited through multiple different online platforms, which may have increased the representativeness of each sample. Additionally, network analysis is an inherently exploratory process that can elucidate complex relationships between variables that may not be evident using traditional statistical techniques, and these techniques can be utilized to explore underlying mechanisms of dissociation subfactors, suicidal ideation, and their covariates. Network analysis also allows us to identify critical nodes that are most strongly related to other variables in the network, which can provide insight into targets for interventions and highlight potential pathways for prevention and treatment. Finally, network comparisons allow us to examine differences in the und erlying mechanisms of dissociation subfactors, suicidal ideation, and their covariates in these two different groups.

However, these findings should be interpreted in the context of study limitations. First, while recommended screening methods were to enhance data quality, this study contained only self-report measures to examine these relationships, which rely on participants' subjective perceptions of their experiences, and can be influenced by

response bias, memory recall, and social desirability bias, which may impact the study's validity (Curran, 2016). Future research should examine these relationships using multi-method approaches, such as combining self-report measures with physiological measures, behavioral observations, or informant reports.Second, these two samples were recruited through Prolific and social media platforms, which may attract individuals who are more likely to participate in surveys or who have specific characteristics (Berinsky et al., 2012), which can limit generalizability. However, as stated above, getting data from multiple online platforms may have also increased the representativeness of each sample.

Third, while the Prolific platform was intended to be the primary recruitment method for both Veteran's and non-Veterans, only 71 Veterans had valid responses through the Prolific platform; therefore, a majority of the Veteran data needed to be collected through social media platforms. In contrast, a majority of non-Veterans were able to quickly and effectively be recruited through the Prolific platform. The variable sample sizes are a notable limitation, as they can lead to issues with statistical power and potentially biased results. Careful attention was taken when choosing the statistical methods in an attempt to limit these potential biases. Additionally, preliminary analyses showed that for both the Veteran and non-Veteran samples, participants recruited through the Prolific platform had significantly lower scores on key study variables when compared to participants recruited through social media. Using multiple recruitment methods may introduce variability in the sample characteristics, such as demographic characteristics or attitudes, which could also impact the validity of the study's results. However, our demographic characteristics for both Prolific and social media samples appear to be consistent with active users currently on Prolific (Prolific, 2023), Pew

Research Center (2021) data examining social media users, and Veteran census data (Vespa, 2020). An examination of US users currently active on Prolific (n = 42,026) revealed that a majority of US users were similar to our Prolific sample and were female (56%), white (68%), and heterosexual (54%). Additionally, US Veteran users currently active on Prolific (n = 516) also were a majority male (75%), white (79%), and heterosexual (72%), which is similar to our recruited sample. Regarding social media participants, a majority of Veteran and non-Veteran were recruited through Reddit, and the characteristics of these samples, namely being a majority white, male, and heterosexual, are consistent with prior reported demographics of US Reddit users (Barthel, 2016). Moving forward, especially when recruiting more targeted samples, such as Veterans, social media recruitment appears to be more successful and cost-effective than other survey platform alternatives.

Fourth, these data are cross-sectional and capture the symptom networks only at one point in time. Therefore, these networks cannot be utilized to establish causal relationships between variables, only identify associations between them. Future studies should examine these links longitudinally in order to establish causality. Fifth, this study did not assess other factors that may be relevant when examining the relationship between dissociation, suicidal ideation, and their covariates, such as type and number of trauma exposure and suicide attempts or behaviors. Network analysis is only able to examine relationships of the variables that are included in the model, and it is possible the relationships of these networks would change with the inclusion of these additional variables. Finally, participants were not recruited based on clinical symptoms, and therefore, these networks may not be generalizable to more clinical samples. However, it

is important to note that despite not recruiting based on clinical symptoms, our participant's means scores on main study variables were higher than what would be expected in a general non-clinical population (e.g., Weathers et al., 2013; Carlson & Putnam, 1993, Rudd, 1989, Spitzer et al., 2006).

Conclusions, Implications, and Future Directions

In conclusion, this study provides important insights into the relationship between dissociation, suicidal ideation, and their covariates in both Veterans and non-Veterans. Findings indicated that Veterans scored higher on most study variables, including dissociation depersonalization and derealization, dissociative amnesia, suicidal ideation, posttraumatic stress, pain tolerance, and anxious arousal. However, non-Veterans reported significantly more emotion dysregulation than Veterans. Findings from the network analyses and network comparison test suggest that there were no differences in network structures or node strength between these two networks. In fact, dissociative amnesia, depressive symptoms, and generalized anxiety were found to be central symptoms in both networks. This indicates that Veteran status may not significantly differentiate the network structures of dissociation and suicidal ideation, and addressing dissociative amnesia, depressive symptoms, and generalized anxiety may have broad effects on overall symptomatology for both Veterans and non-Veterans. These results have important implications for understanding the mechanisms underlying these complex clinical phenomena and may inform the development of more effective interventions for individuals experiencing these symptoms, regardless of their Veteran status. Clinicians should be mindful of screening their clients for dissociation, depression, and anxiety

symptoms, as these symptoms may have broad overall effects on other psychiatric symptomology.

However, when considering expected influence, depersonalization and derealization and depression were most influential overall in the Veteran network, whereas depression and anxious arousal were most influential overall in the non-Veteran network. These differences in node centrality suggest that there may be unique factors contributing to the development and maintenance of dissociation, suicidal ideation, and related disorders in Veterans and non-Veterans, and understanding these differences may help inform tailored interventions that address the specific needs of these populations. In particular, depersonalization and derealization was the most highly influential in the Veteran network. This may be important to consider when implementing gold standard treatments with Veterans who have undergone trauma and are highly dissociated, such as exposure-based therapies such as prolonged exposure and cognitive processing therapy (Edwards-Stewart et al., 2021). Prior research has indicated that individuals who have higher rates of dissociation are more likely to drop out of treatment prematurely or are clinically worse off even if they do engage in treatment (Cloitre et al., 2012), with one study citing over 10% of drop-out cases being due to increased dissociative and suicidal behaviors (Najavits, 2015).

To improve treatment outcomes for this those with higher rates of dissociation, clinicians and researchers may need to consider adapting existing treatments or implementing a stage-based approach, which would involve an initial phase focused on reducing symptom severity and dissociation by teaching grounding and self-soothing skills before engaging in trauma memory. By reducing dissociative experiencing,

Veterans may be better equipped to engage in exposure therapy and experience more effective outcomes (Cloitre et al., 2012). These approaches have been proposed in previous research and hold promise for improving treatment outcomes for individuals with PTSD and high levels of dissociation (Cloitre et al., 2012). Further research is needed to replicate these findings and explore potential moderators and mediators of the relationships between dissociation, suicidal ideation, and their covariates in both Veterans and non-Veterans. Future studies using longitudinal and multimodal approaches are also needed to continue to investigate the potential causal mechanisms underlying these relationships.

APPENDIX A –IRB Approval Letter

Office *of* Research Integrity

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NOTICE OF INSTITUTIONAL REVIEW BOARD ACTION

The project below has been reviewed by The University of Southern Mississippi Institutional Review Board in accordance with Federal Drug Administration regulations (21 CFR 26, 111), Department of Health and Human Services regulations (45 CFR Part 46), and University Policy to ensure:

- The risks to subjects are minimized and reasonable in relation to the anticipated benefits.
- The selection of subjects is equitable.
- Informed consent is adequate and appropriately documented.
- Where appropriate, the research plan makes adequate provisions for monitoring the data collected to ensure the safety of the subjects.
- Where appropriate, there are adequate provisions to protect the privacy of subjects and to maintain the confidentiality of all data.
- Appropriate additional safeguards have been included to protect vulnerable subjects.
- Any unanticipated, serious, or continuing problems encountered involving risks to subjects must be reported immediately. Problems should be reported to ORI via the Incident submission on InfoEd IRB.
- The period of approval is twelve months. An application for renewal must be submitted for projects exceeding twelve months.

PROTOCOL NUMBER: 21-300
PROJECT TITLE: A Network Analysis Examining Dissociation and Suicide Risk Comparing Military Veterans and Non-Veterans
SCHOOL/PROGRAM School of Psychology
RESEARCHERS: PI: Nicole Caulfield
Investigators: Caulfield, Nicole~Capron, Daniel W~
IRB COMMITTEE ACTION: Approved
CATEGORY: Expedited Category
PERIOD OF APPROVAL: 07-Jan-2022 to 06-Jan-2023

Donald Sacco Jr.

Donald Sacco, Ph.D.
Institutional Review Board Chairperson

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