IMPACT OF DISCLOSURE OF MILITARY SERVICE HISTORY ON DIAGNOSIS OF PTSD

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Abstract

Objective

Variability in how clinicians diagnose PTSD has been studied across treatment settings. Research shows several factors impact diagnostic variability. The purpose of this study was to evaluate the extent to which disclosure of military service leads to an increase in diagnosis of PTSD when considering an otherwise vague symptom profile. We hypothesize veteran status will increase the likelihood of a PTSD diagnosis than status as a teacher.

Methods

Clinician were recruited online through professional message boards and listservs. Participants were randomly assigned a vignette (veteran or teacher status) and subsequently asked to make diagnostic judgments. Two vignettes, identical with the exception of veteran or teacher status, were employed to represent a vague symptom profile, unremarkable for any clear diagnostic symptoms. In order to evaluate for the specific impact of disclosure of military service, the vignettes excluded any discussion of trauma or stressors and included vague symptoms common to any number of affective disorders.

Results

A total of 366 clinicians participated in the study. Clinicians assigned to the Veteran vignette were 6-times more likely to diagnose the client with PTSD (Std. Residuals 4.1) than would be expected by chance.

Conclusion and Implications

Client characteristic of "Veteran" impacted the clinicians' diagnostic decision. The findings from this study support a strong relationship between individuals' veteran status and the initial diagnostic inference a clinician will make, specifically PTSD. Exploratory analysis of licensure status and DSM training suggested these variables had a moderating effect on diagnostic selection. There are several implications. The absence of a criterion A stressor is potentially undervalued for veteran clients. Results suggest more research is needed to understand clinician factors influencing diagnostic decision-making.

Chapter 1: Background and Significance

Posttraumatic Stress Disorder (PTSD) is a mental health diagnosis rooted in continuous controversy since its first inclusion in the DSM-III published in 1980 (Marx, 2009). Initial controversy stemmed from the conventional wisdom at the time, which held that battlefield stress diminished once a person was no longer in combat. Tying a diagnosis to a specific historical event was unprecedented and only gained support once it was clear the diagnosis also applied to varied traumatic stressors including natural disaster, sexual assault, and interpersonal violence (McNally, 2003). Thirty-five years later, it is hardly a novel assumption that traumatic experiences can create symptoms of psychiatric distress, yet the diagnosis of PTSD continues to reflect varied and, at times, conflicting beliefs and attitudes about trauma and trauma-response (Rosen & Frueh, 2007).

Variability in how clinicians diagnose PTSD has been studied across treatment settings. Research has focused on the utilization of evidence-based assessment tools, as well as variability in how widely the construct of PTSD might be stretched by clinicians. There is not enough research to identify what non-clinical factors lead to an increase in the PTSD diagnosis. Understanding the drivers of clinical decision-making while serving veterans can help ensure accurate diagnosis and appropriate treatment. The purpose of this study is to evaluate the extent to which non-clinical considerations influence a PTSD diagnosis. More specifically, when presented with a clinically vague case report *with no mention of a traumatic event*, are clinicians exposed to a person with a history of military service more likely to render a PTSD diagnosis than clinicians exposed to the identical clinical profile with no noted inclusion of military service history? Second, what are the

potential moderating effects of specific provider characteristics, such as demographic data or time in practice, on the diagnostic conclusions reached?

In order to convey the significance of our findings, we review seminal literature on PTSD and clinical decision making. We present the literature on key historical changes the diagnostic construct of PTSD has undergone, epidemiological data on PTSD in the military, and central debates in research literature which have informed the revisions of the DSM PTSD criteria. We review available literature on practice variability in the diagnosis of PTSD. Beyond PTSD, we review seminal literature on clinical decision making and heuristics. The intention of this literature review is to provide a cogent framework for understanding provider decision-making and the potential impact of non-clinical data on the diagnosis of PTSD.

What is PTSD?

The Diagnostic and Statistical Manual underwent significant revision in 2013, making significant changes to the diagnostic criteria for PTSD. Subsequent to these changes, PTSD is no longer categorized as an anxiety disorder but has been reclassified as a trauma- and stressor- related disorder. Significant revisions went into the DSM-5 classification of PTSD, and in a paper describing the process for developing the updated guidelines, Friedman acknowledges the complex debates which occurred within the APA working group:

> The Stressor A1 criterion has always been one of the most challenging aspects of the PTSD diagnosis. Although it has always been easy to get agreement that events such as rape, torture, combat, and brutal assault are

> traumatic, such consensus is harder to sustain when the sudden death of a loved one is also considered traumatic, as in the DSM-IV. Furthermore, it has always been understood that whereas exposure to an A1 event is a necessary condition for the development of PTSD, it is clearly not a sufficient condition since most A1-exposed individuals do not develop the disorder (Friedman, 2013).

In order to achieve a diagnosis of PTSD, an individual must express unique symptoms from each of the following five criteria:

Criterion A: exposure to a traumatic stressor.

The DSM-5 defines traumatic exposure as something one must experience directly or witness as it occurs to others and the exposure itself must be "actual or threatened death, serious injury, or sexual violence, in the following way(s):

- Direct exposure
- Witnessing the trauma
- Learning that a relative or close friend was exposed to a trauma
- Indirect exposure to aversive details of the trauma, usually in the course of professional duties (e.g., first responders, medics), (American Psychiatric Association, 2013, p. 271).

National experts in PTSD evaluated and debated the diagnostic construct against the best available research and philosophical assumptions of what should guide treatment and cogent nosological description. The traumatic event exposure, or Criterion A, stands out as the most controversial debate in papers describing changes to the DSM (Brewin, Lanius, Novac, Schnyder, & Galea, 2009; Friedman, 2013). Early controversy around the

traumatic stressor criteria published in the earlier DSM-IV released in 1994, centered around the language in Criteria A being overly confining. Additional debate between researchers pointed to the paradox that some people might experience a significant stressor and have any number of non-PTSD responses, while others noted that many people did not need to be exposed to a stressor as defined by the DSM-IV in order to exhibit hallmark symptoms of the disorder (Breslau & Alvarado, 2007; Rosen, Spitzer, & McHugh, 2008). General disagreement as to the threshold of a "traumatic" event, versus a non-traumatic but stressful event, informed the discussion and decisions around the DSM-5 revisions (Friedman, 2013). Prior to the development of the DSM-5 updated standards, prominent researchers argued for doing away with the Criterion A exposure altogether (Brewin, Lanius, Novac, Schnyder, & Galea, 2009).

The Criterion A was deemed essential and core to the construct of PTSD, but between the DSM-IV and the DSM-5, there was an essential change: the elimination of the requirement that following the exposure to a Criterion A event, a specific reaction must have included an intense emotional response, specifically "fear, helplessness, or horror" (APA, 2000, p. 467). Between the publication of the DSM-IV and the DSM-5, significant evidence has emerged that many people may, by virtue of training or circumstance, not react immediately to a traumatic event in any specific way and still develop full PTSD symptomology overtime (Friedman, Resick, Resick, Bryant, & Brewin, 2011). This finding and decision is specifically relevant to individuals who are routinely exposed to traumatic events and trained to specifically work in highly stressful and potentially traumatic circumstances, such as law enforcement and military.

Criterion B: symptoms of intrusion and re-experiencing.

PTSD is defined, in part, by involuntary intrusive recollections of a traumatic experience, which can present as dreams, dissociative reactions, or intrusive thoughts and flashbacks. There are few changes between DSM-IV and DSM-5 in this criterion. One specific effort was made to distinguish between the more ruminative thought processes common to depression and the "here-and-now images and sensory memories" more specific to PTSD (Friedman, et al., 2011, p. 551).

Criterion C: persistent avoidance.

The avoidance criterion is met by persistent avoidance of stimuli associated with traumatic events and can include memories, places, people, objects and activities. Though avoidance symptoms have not changed between editions of the DSM, mood and numbing symptoms have been separated out from avoidance and are no longer captured by the avoidance criterion. The symptom description has not changed.

Criterion D: negative alterations in cognitions and mood.

This criterion, new to the DSM-5, is a reformulation of the numbing symptoms described in the DSM-IV and influenced by cognitive theories (Friedman, 2013). In order to meet this criterion, an individual must experience at least two negative cognition and mood symptoms, including impaired memory of the traumatic event, negative beliefs and world-view, distorted beliefs about oneself and the trauma or an overall negative emotional state including depressed or angry mood, the inability to experience joy, or detachment or estrangement.

Criterion E: hypervigilence or hyperarousal.

Individuals with PTSD will exhibit a heightened sensitivity to perceived risks and distorted risk perception. This can result in an exaggerated startle reaction, the inability to remain calm in public spaces, or a persistent feeling of being "on guard." Between the DSM-IV and DSM-5, the criterion has broadened to include behavioral reactivity, based on several studies identifying externalizing behaviors as an expression of reactivity (Friedman, et al., 2011; Kilpatrick, et al., 2003).

In spite of the utility of standardized screening and assessment for PTSD, the diagnosis remains dependent on the clinical judgment of an individual clinical observer. Validated, objective assessment measures are underutilized, and providers bring unique beliefs and variation into the assessment process (Jackson, et al., 2011). Variability in how mental health and medical providers diagnose PTSD has been studied across treatment settings. A number of factors have been evaluated as having impact on diagnostic variability. Studies have identified myriad factors, such as provider beliefs and biases, as well as deficiencies in the diagnostic construct as impacting diagnostic variability (Gravely et al., 2011; Jackson et al., 2011; McDonald & Calhoun, 2010; Schillaci et al., 2009). Relative to other mental health diagnoses, PTSD may be particularly vulnerable to variation in diagnostic practices, especially in light of the many changes the diagnostic criteria have undergone since the original inclusion in the DSM-III (Spitzer, Rosen, & Lilienfeld, 2008; Rosen, Frueh, Lilienfeld, McHugh, & Spitzer, 2012). There is some evidence to suggest clients' revelations of non-symptom data, such as social background or history of trauma, early in the course of treatment during clinical assessment, might have the impact of predisposing, or anchoring, a clinician towards a

PTSD diagnosis even in the absence of other PTSD symptoms (Friedlander & Stockman, 1983; Woodward, Taft, Gordon, & Meis, 2009).

Since 9/11, PTSD has been publicly and repeatedly correlated with the wars in Iraq and Afghanistan, having been described routinely as the signature injury of the years-long conflicts (Bodkin, Pope, Detke, & Hudson, 2007b; Litz, 2007; McNally, 2003; McNally & Frueh, 2013; Rosen & Lilienfeld, 2008). PTSD has become a part of the national dialogue when discussing our veterans' mental health needs and experiences. Though PTSD is not an injury unique to military service members and veterans, subsequent to OEF/OIF, the significant majority of funding granted toward developing novel treatments for PTSD has been specific to veterans, or within the Veterans Administration or Department of Defense (Galea et al., 2012).

Exposure to potentially traumatic events across service branches is difficult to measure. Current prevalence rates have been described for specific combat-deployed units, and the exposure rates are unsurprisingly high. According to a 2011 study, up to 75% of service members deployed in support of OEF and OIF reported exposure to incoming artillery and mortar fire, 50% reported seeing dead bodies, and between 15% and 25% reported discharging their own weapon in combat (Ramchand, Schell, Jaycox, & Tanielian, 2011). With these numbers, it would not be surprising if clinicians assumed an equally high, or parallel prevalence of the development of PTSD symptoms. But current epidemiological surveys are largely limited to deployment data and post-deployment surveys. While these studies are vital for understanding and preparing to treat the wounds of war, they also have the potential to yield the impression that all service members are exposed to the same levels of traumatic events. Outside of deployment,

exposure to trauma is not a standard part of military service. Because PTSD is so frequently discussed and studied in the context of the military service, it is possible that military service itself is becoming nosologically linked with PTSD for clinicians, particularly those with less familiarity with military day-to-day experiences.

Additionally, PTSD prevalence estimates vary, but most national military estimates range between 12% and 21% (Hoge et al., 2014; Holdeman, 2009; Kilpatrick et al., 2013; Ramchand et al., 2010; Richardson, Frueh, & Acierno, 2010; Tanielian, 2009). While this rate is non-trivial, it illustrates the significant majority of service members do not report symptoms consistent with PTSD. Even with high rates of exposure to potentially traumatic events during deployments, fewer than 25% of service members will report subsequent symptoms consistent with PTSD. Because of the variability of exposure to traumatic events and even more variability in subsequent symptom development, military service does not directly correlate to traumatic exposure or PTSD.

Issues in the Assessment and Treatment of PTSD

Significant attempts to improve access to effective care for PTSD in veterans have led to a body of research evaluating some of the core challenges in diagnosing and treating the disorder. In studies specifically evaluating the efficacy of current diagnostic practices around PTSD, simple diagnostic variability and lack of utilization of validated or standard assessment measures emerges as a central issue (Gravely et al., 2011; Jackson et al., 2011). Though there is strong empirical evidence that there is variation and variability in how PTSD is diagnosed and assessed, the extent to which diagnostic

variability impacts access to services, treatment resources, individuals and health-systems is not fully understood.

At the broadest level, one of the most obvious impacts of variability in diagnostic practices and tools is the difficulty in establishing consistent prevalence rates when looking at military populations (Ramchand, et al., 2010). At a more local level, diagnostic variability has been looked at within VA and other healthcare systems, and there are two primary, and conflicting findings: PTSD in veterans is over-diagnosed resulting in the pathologizing of a normal and adaptive response, overloading an already burdened care system and confounding efforts at developing effective treatments (Gravely et al., 2011; McNally & Freuh 2012). Conversely, many researchers argue PTSD in veterans is under-diagnosed as a function of inadequate access to appropriate screening, ongoing stigma which limits disclosure of symptoms, and ineffective differentiation by underprepared clinicians to differentiate between other psychiatric disorders and PTSD (Keane, Taylor, & Penk, 1997; Magruder & Yeager, 2008; Marx et al., 2012; Schillaci et al., 2009). There is also ongoing debate over what makes for a normal human response versus a pathological response when confronted with significantly stressful events (Bodkin et al., 2007b; Bonanno, 2004; Litz, 2005). The argument over how PTSD is conceptualized, defined, and utilized is not simply an academic problem impacting research findings and population health data, but an issue of diagnosis and subsequently providing appropriate treatment. Following the failure to attend to the psychological wounds of our Vietnam and Korean War veterans, military and veteran's treatment centers now routinely screen for PTSD in any service member or veteran who has been deployed. In these settings

there is profound variability in how clinicians integrate standardized screening measures and ultimately diagnose PTSD (Gravely et al., 2011; Jackson et al., 2011).

At best, the research discrepancies can be frustrating for front-line clinicians, patients, policy makers and clinical educators seeking to ensure timely and effective treatment. From the papers of those who argue for more proactive screening and diagnosis, there are medical and moral reasons given for prompt screening and diagnosis of PTSD. Medically, the most disabling symptoms of PTSD are considered highly treatable with early intervention (Lobbrecht, Wicherts, Morina, & Priebe, 2014; Richardson, Rumbaugh Jr, & Zembrzuska, 2015). Morally, the sacrifices of our veterans result in a social responsibility to attend to their emotional and mental wounds engendered in national defense (Kolk & Najavits, 2013). There are consequences to both over-diagnosing and under-diagnosing the disorder. These risks include creating issues with access to care, failure to offer disorder-appropriate treatment, and over-pathologizing a normal adaptive response.

For those who are critical of the diagnosis and the manner in which it is applied there are a couple of key themes. First, the rate of veterans seeking compensation for PTSD is growing at a rate considered to be disproportionate to the actual development of PTSD (McNally & Frueh, 2013). Second, PTSD as a diagnostic construct has been exposed to considerable scrutiny since it was first proposed for inclusion in the DSM-III in 1980 and through subsequent revisions the scrutiny has not lessened (Bodkin, Pope, Detke, & Hudson, 2007a; Breslau & Alvarado, 2007; Litz, 2003; McNally, 2003; Rosen et al., 2008; Rosen, Lilienfeld, Frueh, McHugh, & Spitzer, 2010). Of all the diagnoses present in the multiple editions of the DSM, PTSD has undergone, by far, the most

significant changes from edition to edition (Spitzer, First, & Wakefield, 2007). Between the DSM-III and DSM-IV, PTSD was altered so that the traumatic experience criteria no longer required the direct experience of a specific event but could be met by secondary, or vicarious, trauma (McNally, 2003; Spitzer et al., 2007). This led to what some researchers and clinicians claimed was conceptual bracket creep, and researchers frequently noted other disorders are likely being encapsulated by a PTSD diagnosis, due to issues with the vagueness of its criteria (Bodkin et al., 2007b; McNally, 2003; Rosen & Lilienfeld, 2008). In spite of broadening the criteria around trauma exposure (criterion A), the DSM-V continues to draw very specific parameters around qualifying events. Those critical of adjustments to the criteria around trauma exposure have said that it "tie(s) clinicians' hands" and removes previously qualifying events, such as the death of a child from prolonged illness or the remote death of an esteemed battlefield commander, from consideration as a criterion A stressor (Hoge et al., 2016).

In spite of the ongoing controversy, it would seem all parties agree that there is a lot at stake for a vulnerable population. How we understand and classify the emotional and mental health injuries incurred in combat translates into how we develop and deliver effective treatments. If screening, diagnosis, and treatment options are to be improved for our veterans, we must account for potential hindrances to delivering that care.

Conceptual Challenges with PTSD as a Diagnostic Construct

Rosen and Lilienfeld (2008) open their evaluation criticism of the core assumptions of PTSD with an acknowledgement of the controversy surrounding the diagnosis. Citing Spitzer, First, and Wakefield (2007) they note: "Since its introduction

into the DSM-III in 1980, no other DSM diagnosis…has generated so much controversy in the field as to the boundaries of the disorder, diagnostic criteria, central assumptions, clinical utility, and prevalence in various populations" (as cited by Rosen & Lilienfeld, 2008, p. 838). Rosen and Lilienfeld (2008) evaluate the construct validity of PTSD and whether it possesses "substantial incremental validity for predicting clinically important external validating criteria, above and beyond extant and better validated diagnoses (e.g., specific phobia, generalized anxiety disorder, depression)" (p. 838).

Rosen and Lilienfeld's (2008) critique specifically identifies significant problems in the current research about the criterion A (experience or exposure to trauma) relationship to clinically significant distress. They note a wide body of mental health and epidemiology research that finds the fulfillment of PTSD symptom criteria absent any traumatic stressor—instead following natural life stressors of friendship difficulties, marital distress, bereavement, and frightening television programs (p. 839). The question underlying their critique, then, is whether clinicians/researchers are 'looking' for something specifically different than normal human responses to normal human stressors when evaluating for PTSD? Further supporting the idea that PTSD is a category that might be too broadly applied, they cite a study by Bodkin, Pope, Detke, and Hudson (2007) who found that individuals presenting for treatment of depression or anxiety, but not PTSD and with no endorsement of a trauma history, were diagnosed with PTSD—at a rate of 78%—by noting they were able to recall a distressing time (in place of a traumatic stressor) when responding to assessment questions from a Structured Clinical Interview (SCID).

Conversely, it is entirely possible (indeed, likely) to experience trauma and not develop PTSD symptomology. In traditional dose-response models the clinical response would be, in some way, equivalent to the magnitude of the stressor. This does not appear to be the case with PTSD. Rosen and Lilienfeld (2008) cite no fewer than 15 reviews, structural equation modeling studies, psychological research studies and meta-analyses that find "(a) most individuals do not develop PTSD after Criterion A events, (b) simple dose-response relationship is often not supported, and (c) factors extraneous to the event contribute more variance to clinical outcome than the event itself" (p. 840). The ideas that traumatic events have little predictive value in assessing symptoms and symptoms of PTSD are not considered unique to trauma-response pose serious challenges to the validity of the PTSD diagnostic construct according to Rosen and Lilienfeld (2008).

The concern over construct validity might have front line clinicians scratching their heads, as they routinely see psychiatric distress associated directly with traumatic events. But if we are to commit to providing the best possible treatment, as measured by consistent reduction in symptom distress, then it is incumbent on providers to regard studies like Rosen and Lilienfeld (2008) as challenges to reduce vagaries and variation in diagnosis and resulting treatment. One of the most significant challenges noted by Rosen and Lilienfeld (2008) is posed by comorbidity and symptom overlap. Comorbidity in and of itself does not pose a challenge to the distinctness of PTSD as a diagnosis, but "the problem is that many of the symptom criteria that define PTSD also serve to define the very disorders with which PTSD most frequently occurs," (p. 845).

In a 1997 paper Keane, Taylor and Penk reported on their study specifically intended to measure if PTSD can be diagnostically distinguished between other

frequently co-occurring psychiatric disorders, particularly major depressive disorder (MDD) and generalized anxiety disorder (GAD). Utilizing an instrument which included 80 specific line-item symptoms and associated features relating to PTSD, MDD and GAD, they assessed 340 clinicians experienced in diagnosing PTSD with their ability to sort and rate individual symptoms into distinct diagnostic categories. They noted that their study was able to answer, "Can clinicians differentiate PTSD from GAD and MDD?" by analyzing the degree of difference in scoring by clinicians who each rated the same 90 symptoms (p. 320). Multivariate and univariate analysis of variance provided strong support for the idea that PTSD is readily differentiated from MDD and GAD along symptom clusters as well as associated features. The authors also acknowledged certain limitations of the study. While their findings support the idea that experienced clinicians are able to respond to nominal prompts, they were not asked to rate actual patients who present with vague and overlapping symptoms. This means, for the purpose of their study, clinicians were reporting on their memory of "prototypical" patients (p. 326).

Diagnostic Accuracy and Clinical Judgment

One can begin to understand the importance of clinical consistency in assessing and treating PTSD when reviewing literature related to the clinical practice guidelines for PTSD. Benzodiazepines, largely considered effective in treating GAD and specific phobias, has been shown to be ineffective in treating PTSD (Guina, Rossetter, DeRhodes, Nahhas, & Welton, 2015; Lund, Abrams, Bernardy, Alexander, & Friedman, 2014; Mohamed & Rosenheck, 2008a; Mohamed & Rosenheck, 2008b; Rosen et al., 2013). Nonetheless, long after this was identified, benzodiazepines continued to be a routine

treatment. In 2013, researchers conducted a cross-sectional analysis of national Veterans Health Agency (VHA) psychopharmacological data from 2009. They reviewed the records of 356,958 veterans with active diagnoses of PTSD who were receiving medication from VHA prescribing providers. In spite of widely circulating guidelines noting the detrimental impact of benzodiazepines as a pharmacological agent for the treatment of PTSD, 37.0% of patients had received a benzodiazepine prescription in the last year. This was not simply an issue of quick prescribing in primary care given 68.8% of these prescriptions were written by mental health clinicians.

There are limits to what can be inferred by extant data. Little is known about the mechanisms responsible for the wide variety of diagnosing and prescribing practices of clinicians working with PTSD. Little is known about the clinical judgment that leads a clinician to formulate a treatment plan or diagnosis in or out of accordance with best practice standards. In an attempt to make diagnosis and the pipeline to treatment straightforward, the VA system (responsible for the vast majority of military-related PTSD care) theoretically utilizes standardized screening, interviews, and multimodal testing as a routine measure. However, in a study reviewing clinical variability in PTSD diagnosis by mental health providers, fewer than 15% of 138 surveyed clinicians reported ever using a standardized interview, less than 1% reported using functional assessment scales, and fewer than 59% reported relying on any testing (Jackson et al., 2011). Clinical diagnosis should be formed by clinical information, specifically symptom reports and biomedical data (Trechak, 1999). There is data to suggest that clinical judgment is influenced by a variety of non-clinical factors.

The DSM was developed on the assumption that psychiatric disorders should be orderly, recognizable, and classified as objectively as possible and assessed standardly irrespective of theoretical orientation. Though psychiatric disorders have always been classified with a specific nosology, the classifications and characterizations of early psychological constructs were highly subjective (Shorter, 2013). Classical psychological theories intentionally drew from the affective experience of the observer/expert to inform conclusions about the subject (Garb, 1994; Kim & Ahn, 2002). Objectivity was not a central construct in early psychological theory. But over the last several decades, the subjective analysis of the observer has become largely subordinate to more rigorous conventions within both clinical research and practice. Even within qualitative research, there is a strong movement to improve interrater reliability (Armstrong, Gosling, Weinman, & Marteau, 1997; Glaser, 2017). The current classification system for psychiatric diagnoses does not explicitly place any primacy on the subjective interpretation of the observer/expert. Disorders are standardized and explicitly defined to a degree that limits, in as much as is possible, subjectivity.

Even as we move towards highly empirical and standardized models of assessment and treatment, clinicians, not computers, are responsible for diagnosing and treating the overwhelming majority of psychological injuries and illnesses. It isn't necessarily reasonable or desirable for clinicians to completely suspend their internal judgments in favor of rigid algorithms. However, improving accuracy and validity within diagnosis and assessment requires limiting subjective interference. Structured Clinical Interviews routinely are shown to yield more accurate and valid diagnosis than unstructured and interpretive clinical assessments (Basco et al., 2000; Miller, Dasher,

Collins, Griffiths, & Brown, 2001). Psychology and social science are, by definition, a human enterprise, therefore, understanding what drives clinical judgment is important to improving healthcare quality (Hajjaj, Salek, Basra, & Finlay, 2010; Nelson, Stith, & Smedley, 2002; Spoont et al., 2014). At the broadest level, understanding what factors influence clinical judgment and decision-making can help to inform clinical training and service delivery frameworks that can improve quality healthcare and research for everyone.

Clinical judgment research is broad and crosses all medical and clinical disciplines. The broadest body of research into clinical judgment has been conducted in the field of family medicine and general medical practice (Blumenthal-Barby & Krieger, 2015). Blumenthal-Barby and Krieger (2015) identified 5606 studies that evaluated biases and heuristics across client and clinician populations. Because cognitive processes typically occur without notice or observation, many of the factors that impact clinical judgment are subtle and not easily observed (Garb, 2005; Kihlstrom, 1990). Some clinical judgment research has focused on identifying the hazards of specific factors such as biases, socioeconomic and racial beliefs, stereotyped beliefs about prototype-patients and non-clinical contextual factors. Other research has identified positive aspects of cognitive short-cuts, or heuristics.

Heuristics

A heuristic, in general, is a concept that refers to a decisional process wherein an individual will assimilate certain information, or limited data points, into a broader contextual meaning, allowing for “short cuts” in thinking (Garb, 2005). Cognitive heuristics, formulated by Tversky and Kahneman (1974), have been applied to describe

how clinicians think. Biases and heuristics are frequently used interchangeably but they are not identical concepts. Heuristics, broadly stated, refer to the cognitive processes at play when making judgments under uncertainty (Blumenthal-Barby & Krieger, 2015; Dumont, 1993; Elstein, 1999; Garb, 2005). In the context of clinical decision-making and judgment, clinicians are, almost always, working from imperfect and incomplete information. A patient presenting for psychological assessment is unlikely to relate their problems, symptoms, stressors, and social context in a complete and cogent way. Instead, there are a number of influences that impact how someone might recall or present their information to a clinician during an assessment (Arkes, 1981; Bloom & Bloom, 1963; Dumont, 1993). For example, based on mood or events of the day, an individual can be expected to assign weight to perceived vulnerabilities differently on one day than another (Blumenthal-Barby & Krieger, 2015; Harding, 2004; Tversky & Kahneman, 1973). The clinician's task is to assimilate the incomplete information into a cogent assessment. The process by which a clinician fills in the gaps and makes inferential judgments is driven by heuristic strategies.

The heuristic strategies an individual might employ are driven by myriad factors. A clinician's theoretical orientation has significant influence on how s/he forms judgment. Theoretical frameworks exist to create context for how clinicians view a client's presenting problems and, by extension, make inferential leaps in the absence of information. Clinicians trained in specific schools or adherent to a specific clinical school of thought can be expected to filter facts and develop inferential conclusions through the lens of their specific orientation. Therefore psychoanalytic, Rogerian, or cognitive therapists are likely employ to heuristic strategies specific to their orientation, but

somewhat similar to those within their own school when assessing a client (Bandura, 1969; Dumont, 1993). Heuristics are, in many ways, helpful in consolidating vast amounts of information in a way that allows for ready formation of causal theories. But there are risks, too. Blumenthal-Barby and Krieger (2014) suggest that reliance on heuristic strategies may ultimately lead to the development of "cognitive biases, i.e., systematic and predictable errors in judgment" (p. 539). Additionally, initial clinical judgments appear to be stubborn and resistant to change, even in the context of new presenting information (Dumont, 1993).

Several heuristic strategies, unrelated to a specific theoretical orientation have been described as having universal impact on clinical practice. These are described below.

Affect heuristic

Introduced by Slovic et al (2002), the affect heuristic describes one's affective responses to information, an instantaneous process linking emotions to one's beliefs. The authors outline a theory, drawn from cognitive neuroscience and literature on psychological somatization, that when an individual experiences a stimulus, there is an immediate categorizing of the stimulus based on their own affective response which informs their future judgment about the stimulus. They note "affective responses occur rapidly and automatically—note how quickly you associated with the stimulus words treasure or hate. We argue that reliance on such feelings can be characterized as the affect heuristic" (p. 1335). Drivers of affective response are not necessarily positive or negative experiences in an individual's history. Indeed, it has been identified that repeated

exposure to a stimulus is enough to create positive preference and positive affect towards stimuli (Bornstein, 1989; Slovic, Finucane, Peters, & MacGregor, 2007; Zajonc, 1968).

The affect heuristic was not framed specifically around clinical judgment. Slovic et al., (2007) drew largely from social and cognitive psychology to explain how affective response drives general judgment. It was Garb (2005) and Dumont (1993) who linked the impact of an affect heuristic to clinical judgment. Garb described the impact of the affect heuristic as significant, and succinctly noted that how a clinician feels about a stimulus has a major impact on their clinical judgment. The direct implication is that clinical judgment isn't formed solely by the input and processing of clinical information. An additional component to clinical judgment is driven by a clinician's affective response to clinical and non-clinical data presented by the client. Because clients receiving clinical assessment come from a broad array of backgrounds and present under various circumstances, there are myriad factors to which a clinician responds. A client's socioeconomic background, style of dress, profession, or personal history might evoke a subtle and unobserved affective response. If this response is positive, the clinical judgment might then align with the ascribing or assessing of positive qualities. For example, beliefs that a client demonstrates resilience, sympathy, and worthiness might be evoked by a general affective response. Conversely, if the affective response a clinician experiences is negative, there is risk of assigning more negative clinical assumptions, for example, when a client is assessed as attention-seeking, non-resilient, and problem-causing (Garb, 1994; Garb, 2005).

Representativeness heuristic

Representativeness is described in the earliest literature on heuristics as the "major heuristic for making causal judgment" (Dumont, 1993, p.198). Something is representative if it has a similar antecedent, and the two phenomena become cognitively linked for an individual. Representativeness is established through probabilistic reasoning, that is, "what is the probability that object A belongs in class B? What is the probability that event A originates from process B? What is the probability that process B will generate event A?" (Tversky & Kahneman, 1974, p. 109). If we have a neighbor who demonstrates helpfulness, keeps their property tidy, and is generally reliable, what is the probability that they are responsible for neighborhood graffiti? If a client experiences violence perpetrated by a group of adolescents, future groups of adolescents may become representative of that threat. The significance of the representativeness heuristic is that it becomes a part of one's formal thought structure, such that disconfirming evidence, i.e., repeated exposure to groups of non-violent adolescents, are filtered out and not integrated into one's broader perspective (Dumont, 1993; Tversky & Kahneman, 1974).

Conversely, clinicians apply instantaneous probabilistic reasoning to client data, making cause and effect inferences with limited and incomplete data. Without knowing a comprehensive history, it is common for a clinician to make inferential leaps that contemporary concerns are grounded in early life events for clients. Because time with clients is frequently limited, this can be an important process for expediting meaningful case-formulations and treatment plans.

Availability heuristic

One of the fundamental challenges with clinical assessment is the relative paucity of relevant data. Frequently clients do not recall or ascribe minimal value to important life events. The data, however complete, is not translated directly into a case conceptualization. Instead, salient clinical information is reduced, or filtered, by the clinician based on a number of factors, rendering a select amount of information available for case formulation. A number of clinician-driven factors have been found to reduce the available data used in clinical case conceptualization: biased beliefs about what is relevant, theoretical orientation, clinicians' personal histories, and potentially even the time of day (Fiske & Taylor, 2013). The information that is presented to a clinician is filtered through "screens of beliefs, theories, behavioral principles, and personal schemata" (Dumont, 1993, p. 198).

Individuals do not recall information presented to them with crystalline memory. Anything one learns or hears is processed through one's own recollective process. The information presented during an assessment, and over the course of therapy is recalled and utilized according to clinician memory, client emphasis, and the extent to which it is ascribed value by both clinician and client. Studies conducted to learn how individuals process information have identified broad subjectivity in how they/a person assign(s) value to the information presented to them/him/her in a variety of contexts. There is risk, then, that the way information is presented in a clinical interview may affect how that information is weighted and valued by the clinician. In addition, the subsequent way in which the clinician recalls that information can be based on a number of subjective criteria that may or may not reflect the client's broader reality. Social psychologists have

set up experiments on how an individual's mood impacts an individual's recollection and processing of information. Individuals in a negative mood may be more likely to interpret and process information in a negative manner (Bower, 1981; Isen, 1984). The availability heuristic describes the automatic filtering and recollection of clinical data, leaving only what passes through the filter available for clinical assessment. Several writers have pointed out that the information that most commonly makes it through the filter and is utilized is the most dramatic and vivid information, which may routinely eclipse the more mundane, but potentially equally important information (Dumont, 1993; Isen, 1984; Tversky & Kahneman, 1973; Tversky & Kahneman, 1974).

For an example of the potential risks associated with the availability heuristic, consider a clinical assessment wherein a client reveals a recent traumatic event. Because the trauma is a vivid and relatable data point in the assessment, issues like chronic poor self-esteem, ongoing personal stress within a relationship, and a history of benevolent neglect by a parent may be easily overlooked. Consequently, the trauma may be the central focus of an assessment and subsequent intervention. It is a vivid and dramatic cue that limits the extent to which other salient issues are recollected in the therapeutic engagement.

Bias

The differentiation between heuristics and biases is not always discrete. Some of the seminal literature on heuristics refers to cognitive biases and heuristics almost interchangeably and without differentiation (Tversky & Kahneman, 1974). One researcher noted that decisional shortcuts in medicine are referred to as heuristics, until they fail, at which point they are then called "cognitive errors," (Croskerry, 2002). That

said, most heuristic studies and theoretical papers are somewhat agnostic, overall, on the negative aspects of heuristics. They are frequently described as the necessary cognitive processes which allow clinicians to make rapid sense of incomplete information. It may be that some biases are not harmful or impacting. But there are several biases that have been researched and found to have significant negative impact on clinical care.

In 2002, the Institute of Medicine (IOM) issued a review of 100 studies on the impact of race and ethnicity of patients on the healthcare they received (Nelson et al., 2002). The studies reviewed controlled for other potentially confounding variables (including socio-economic status, insurance, gender, etc.) in order to more accurately assess the specific impact of race and ethnicity. The authors of the report did not hide their surprise at the consistency of research findings indicating significant discrepancies in the receipt of clinical services between Caucasian and minority patients across disease areas (Nelson et al., 2002).

In a separate study assessing physician attitudes towards patients of different races and socioeconomic statuses, the authors developed a 22-item survey to assess physician's attitudes towards patients following routine cardiac procedure (Van Ryn & Burke, 2000). Physicians completed 618 surveys, subsequent to encounters with black, white, male and female patients. The investigators found that physicians participating in the study identified black patients as less intelligent than white patients, less likely to abstain from alcohol abuse, and less likely to be rational. Physicians participating in the study identified black patients as significantly less likely to be "pleasant or likable," and significantly more likely to be medically non-compliant (p. 820).

It can be difficult to study racial bias among clinicians. People are unlikely to recognize bias, and factors such as social desirability lead to clinicians performing in a way they think is the most desirable and less reflective of unfiltered biases and beliefs. In one study specific to mental health, clinicians were primed with words associated with African American stereotypes (Negroes, Blacks, lazy, blues, rhythm, Africa, stereotype, ghetto, welfare, basketball, unemployed, and plantation). A comparison group was primed with neutral words (water, things, wood, television, etc.). The clinician group exposed to the racially stereotypical words were significantly more likely to rate a fictional client presented in a subsequent clinical vignette more negatively on a rating scale, specifically on hostility-related measures (Abreu, 1999). A 2015 NIH-funded systematic review identified low-to-moderate levels of implicit bias across clinical professions: primary care, nursing, psychiatry and psychology (Hall et al., 2015). This review included the results of 15 unique studies, with only one not finding provider bias impacting health care decisions or treatment outcomes.

The impact of bias on clinical judgment is not limited to race. In a seminal study on the influence of socio-economic class on psychiatric diagnoses, an otherwise vague clinical case study was much more likely to be assigned a severe diagnosis (psychotic disorder) if the client, identical in every other way to a comparison client, was believed by the clinician to belong to a lower socio-economic group (Di Nardo, 1975).

Gender bias in clinical diagnosis has been studied for decades, but the findings remain controversial and subject to ongoing debate (Hartung & Widiger, 1998). The DSM-III was criticized for gender-bound descriptions of symptomology that might lead to an otherwise healthy female fulfilling the criteria for Histrionic or Borderline

Personality Disorder, if assessed at the wrong moment in time (Kaplan, 1983). With arguments about the gendered-assumptions of DSM architects, it has complicated the study of clinician versus construct issues when it comes to assessing the impact of gender on clinical diagnosis (Hartung & Widiger, 1998; Trechak, 1999). Even committee leadership who participated in the drafting of the DSM-III acknowledged significant conceptual issues around gender and conceded gender bias constituted "a major flaw in its scientific and clinical value" (Widiger & Spitzer, 1991, p. 2).

Anchoring and Adjustment

Within sociology and cognitive sciences, a number of studies have identified the phenomena in which information presented early bore significantly greater impact on formation of judgment than subsequent information presented. The initial information creates an *anchor*, which constrains the degree to which subsequent information is utilized to adjust one's judgment (Tversky & Kahneman, 1974). That is, "different starting points yield different estimates, which are biased towards the initial value," (Tversky, 1974, p. 1128). Non-clinically, this phenomenon has been repeatedly demonstrated during sociological experiments (Friedlander & Stockman, 1983; Tversky, 1974).

Because clinicians are required to make judgments based on incomplete data, their first formulation should, ostensibly, adjust as new information supplements the initial clinical picture. If the literature on anchoring effects translates from general judgment to clinical judgment, there is the risk that clinical judgment is biased towards information that is presented early in the clinical assessment process. Studies have produced varied results when testing potential anchoring effects on clinical judgment. In

one study, findings supported the anchoring effect of when information was presented, by using clinical vignettes with an otherwise identical symptom profile, manipulated only to present a history of Childhood Sexual Abuse (CSA) early in the vignette or later in the vignette. The study asked clinicians to form a diagnostic impression between PTSD or Borderline Personality Disorder (BPD). Clinicians presented with the history of CSA early in the case presentation were significantly more likely to incorporate the trauma context into their diagnosis and assigned PTSD as the case assessment. Clinicians who were presented with the same vignette, but the CSA history presented later in the case review, were more likely to diagnose BPD (Woodward et al., 2009).

The evidence of an anchoring effect on clinical judgment, however, is far from conclusive. Ellis, Robbins, Schult, Ladany, and Banker (1990) looked at the extent to which clinical judgments would be adjusted with the introduction of subsequent information, in this case, vignettes regarding a fictitious case example of a male presented with symptoms of an eating disorder. The "additional" information was intended to present a potentially new clinical picture, testing the power of the anchoring effect. Instead, they found the diagnosis arrived at by research participants did not reflect anchoring, and the research participants adjusted their diagnosis according to the new information. In another study, Friedlander and Stockman (1983) found mixed results. Utilizing clinical vignettes, the case presentations were altered in a manor to vary when salient diagnostic information was presented. In this case, significant anchoring effects were found in the case of a client who was presented as clinically moderate, but no anchoring effects were found with a client who was presented as severely suicidal.

Assessing Clinical Decision-Making

Clinical vignettes are considered useful tools in assessing clinical decision-making. They have been applied in nursing research to examine professionals' attitudes and beliefs (Evans et al., 2015; Hughes, 02). They have also been used in social work research to evaluate clinical judgment in mental health and child welfare systems (Wallander, 2011). Psychology researchers have utilized clinical vignettes to assess the impact of provider bias in clinical assessment (Evans et al., 2015). Vignettes have the value of being inexpensive and much easier to conduct than an observational study. It is a well-validated component of experimental analysis in social and medical science research (Evans, Roberts, Keeley, & Blossom, 2005; Mendel et al., 2011; Veloski, Tai, Evans, & Nash, 2005; Wallander, 2011; Woodward et al., 2009).

In summary, while PTSD prevalence estimates vary, most national estimates range between 12% and 21% (Hoge et al., 2014; Holdeman, 2009; Kilpatrick et al., 2013; Ramchand et al., 2010; Richardson, Frueh, & Acierno, 2010; Tanielian, 2009). In addition, PTSD as a diagnostic construct changes frequently (Bodkin et al., 2007b; McNally, 2012) and that may lead to clinically variable conceptualization among providers assessing real-time patients in the process of conducting a diagnostic assessment (Keane et al., 1997; Rosen & Lilienfeld, 2008). Additionally, clinical judgment has been shown to be influenced by a number of non-clinical factors which may impact diagnostic accuracy. Given the importance of appropriate diagnosis and screening for PTSD, this study intends to fill the gap in the current literature in how veteran status specifically influences diagnostic decision-making.

For the purpose of the present study, clinical vignettes were applied in an effort to test the following hypothesis: clinicians presented with a vague symptom report are more likely to diagnose PTSD if they are presented information that the patient has a history of military service compared to clinicians presented with the same symptom report with no disclosure of military history and is instead identified as a teacher. Additionally, exploratory analysis was conducted on participant factors to measure which clinician characteristics may have a moderating effect on the diagnosis of PTSD, including time in clinical practice, the era a clinician was trained (under DSM-IV or DSM-5), theoretical orientation, professional license type and/or status, race, gender, age, practice setting, and practice location.

Chapter 2: Research Design and Methods

Methods

The primary purpose of this study was to evaluate the influence of a single, non-symptom variable on the assessment of PTSD by clinical professionals. More specifically, the aim was to test the hypothesis that disclosure of military service may be interpreted as equivalent to a criterion A stressor, even in the absence of any description of trauma associated with military history. A secondary aim of the study was to explore moderating effects on diagnosis based on participant characteristics. Two vignettes, identical with the exception of veteran status, were drafted to represent a vague symptom profile, unremarkable for any clear diagnostic symptoms. In order to evaluate for the specific impact of disclosure of military service, the vignettes excluded any discussion of trauma or stressors in order to avoid any other priming towards a PTSD diagnosis. In addition, the vignettes did not identify client gender or age, and included vague symptoms common to any number of affective disorders, thereby isolating military service as the sole variable under examination. For equivalency between vignettes, a profession was assigned to the control group: teacher. To test the hypotheses, respondents consenting to an anonymous online diagnostic survey were randomly assigned to the vignette with or without the disclosure of a history of military service. All procedures were approved by the University of Pennsylvania Institutional Review Board.

Creation of Vignettes

To ensure the verisimilitude of the vignettes, a draft vignette was presented to a panel of experts. The panel was composed of 11 mental health providers across

disciplines: psychiatry, social work, psychology, and psychiatric nurse practitioners. Each panel member was in possession of their current license and was in practice more than 6 years across a variety of settings, including community mental health, academic settings, private practice, inpatient psychiatry, and in military and veteran-specific treatment centers. Vignettes were emailed to panel members individually with a request to suggest edits which would capture the most commonly reported, diagnostically agnostic complaints presented in early clinical assessments. All panel members responded with input and the vignettes were refined following feedback.

Following the input from the panel members, the vignettes were redrafted and resubmitted to the panel. Once each individual panel member responded via email that this was a reasonable, common and vague presentation, the vignette was finalized to include the following characteristics:

- Insomnia: In addition to being a specific, diagnosable disorder, insomnia is strongly associated with depression (where it is named as a specific criteria for diagnosis), anxiety, and PTSD (Baglioni et al., 2011; Inman, Silver, & Doghramji, 1990; Taylor, Lichstein, Durrence, Reidel, & Bush, 2005; Walsh, 2004).
- Emotional detachment: This is a hallmark symptom of depression, but is also accounted for in the criterion D symptoms of PTSD in the DSM-5 (American Psychiatric Association, 2013).
- Difficulty relaxing and enjoying things: This is a vague characteristic not linked to any specific diagnosis. Any individual with any mental health or

physical health diagnosis, depending on diagnostic severity, could report this characteristic.

- Relational difficulties with significant other: This is a vague characteristic not linked to any specific diagnosis. Any individual with any mental health or physical health diagnosis, depending on diagnostic severity, could report this characteristic.
- Irritability and anger: This symptom is frequently associated with a variety of diagnoses including depression, PTSD, and bipolar II disorder (American Psychiatric Association, 2013).
- Frequent worry and rumination: Patterns that reflect anxious anticipation or repetitive and negative thinking styles are also not unique to any specific diagnosis, but are reported by individuals with anxiety, depression, mild mania, PTSD and bereavement. Note: in order to avoid a direct correlation to the PTSD symptom of intrusive thoughts, there is no mention or description of thought intrusion.

Study participants (described below) were invited to assess a clinical vignette and answer a diagnostic survey based upon their interpretation of the symptoms presented. The clinicians were randomly assigned to one of two vignettes, one with history of military service and one without history of military service. Our experimental group (those receiving a vignette with a history of military service) is designated Group A while the other, control, group is designated Group B. For the purpose of balance, the Group B vignette included a description that the client was a school teacher. The vignette and the post-vignette survey questions are presented in Appendix A.

Sample Size and Recruitment

Recruitment email requests were sent to Association for Behavioral and Cognitive Therapies member-only listserv and National Council for Behavioral Health member-organization email distribution list. Recruitment requests were also posted on social media, including the following Facebook group pages: Military Social Work, Association of Professional Social Work, Military Mental Health Providers, American Psychological Association Division 19 (Military Psychology), American Psychological Association public group. Respondents were all offered the opportunity to be entered into a sweepstakes for one of 10 $50 electronic Amazon gift-cards for participating.

Power Analysis

Studies of the effect of bias and heuristics on diagnoses of mental illness using vignettes similar to that proposed in the current study have reported effect sizes ranging from small to large depending on the bias or heuristic under study. The number of diagnostic criteria and the addition of criteria deemed important to the diagnosis were found to have large effects on diagnosis (Bruchmuller & Meyer, 2009; Wolkenstein, Bruchmüller, Schmid, & Meyer, 2011). However, therapeutic approach (Bruchmuller & Meyer, 2009) and the gender of the patient (Høye, Rezvy, Hansen, & Olstad, 2006) were found to have small effects on diagnosis. In order to assure the sample size needed for the power to detect the effect of the variables of interest on diagnostic decisions using vignettes, two power analyses were conducted. The first was conducted to identify the sample size needed to detect a difference between two independent proportions, or the difference in diagnosis between the experimental and control groups with or without the

addition of a military history. Based on previous literature, a large effect was assumed and used in Cohen's power table with a $p < 0.05$ and a power of 0.80, identifying a sample size of n=25 per group or a total sample of N=50 (Cohen, 1992). The second analysis was conducted to identify the sample size needed to explore the moderating effect of respondent *license type/status* and *era trained* (under DSM-IV or DSM-5) on diagnosis with or without the addition of a military history. Based on previous literature, a small effect on the difference between two independent proportions was assumed and used in Cohen's power table, a $p < 0.05$, and a power of 0.80, which identified a sample size of n=392 per group for a total sample of N=784.

Inclusion Criteria

Participation was limited to English-speaking adults who graduated from a professional, clinical mental health program, with a minimum of a master's degree. Acceptable degrees included counseling, psychology, social work, marriage and family therapy, psychiatric nursing, and psychiatry. Participants were required to have completed at least one full graduate course in diagnostic assessment of mental health disorders. This survey was open to clinically licensed professionals with provisional or full licenses, as well as graduates of clinical mental health programs who had not yet obtained their provisional license. Licensure status was self-reported and was not verified. See Appendix B for the Letter of Invitation.

Eligibility Questions (these were included in the invitation email directly above the link to the survey):

- I have completed a graduate program in a clinical (mental health) program: y/n

- I have completed at least one full graduate course in the assessment and diagnosis of mental health disorders: y/n

Setting: This was an online study consisting of a single survey. A direct link to the survey was provided through email and social media recruitment.

Randomization

Using Qualtrics, one group of randomly assigned clinicians, Group A, received the case presentation in which the "client" was identified as a "veteran." The second group of randomly assigned clinicians, Group B, received an identical symptom report but the client was identified as a "school teacher." Random assignment was set for a 1-to-1 distribution. Standardized response options were provided in an effort to gather consistent and interpretable data. Randomization occurred after respondents provided Informed Consent via electronic signature.

Measures

Participants were asked to report anonymously on demographic and professional data, including: licensure status, time in practice, DSM training, highest degree achieved and in what field, theoretical orientation, practice experience with populations, practice experience with disorders, current practice setting, gender identification, and ethnicity. Standardized answers were provided where applicable to facilitate exploratory analysis.

Immediately following the vignette, respondents were asked to answer the questions shown in Figure 2.1.

Human subjects

This was a fully voluntary and anonymous online survey delivered to a professional population. There was no personally identifiable information about

participants associated with their survey responses. After completing the survey, all participants were invited to go to a unique link and enter their email in order to receive a gift card if selected. The email addresses were not linked to any survey responses and a

Question 1.
Based upon the vignette you have just read, please identify the primary diagnosis you would first consider for this client. Because you have been provided intentionally limited data, please extrapolate to the best of your ability, a single diagnosis from the list below you feel best reflects the client's presentation.

- Anxiety Disorder
- Bipolar I Disorder
- Bipolar II Disorder
- Borderline Personality Disorder
- Major Depressive Disorder
- Persistent Depressive Disorder (formerly Dysthymic Disorder)
- Posttraumatic Stress Disorder

Question 2.
Please select up to 3 diagnoses you would pursue in further assessment as possible rule-outs, or "No rule-outs":

- Anxiety Disorder
- Bipolar I Disorder
- Bipolar II Disorder
- Borderline Personality Disorder
- Major Depressive Disorder
- Persistent Depressive Disorder (formerly Dysthymic Disorder)
- Posttraumatic Stress Disorder
- No rule-outs

Question 3.
Please select which diagnoses, if any, you feel are not supported by any information presented in the vignette, or "No selection". There is no limit to the number of diagnoses you may select.

- Anxiety Disorder
- Bipolar I Disorder
- Bipolar II Disorder
- Borderline Personality Disorder
- Major Depressive Disorder
- Persistent Depressive Disorder (formerly Dysthymic Disorder)
- Posttraumatic Stress Disorder

Figure 2.1 *Survey Questions for Primary Diagnosis, Rule-outs and Not Supported Diagnoses Based on Vignette Presentation*

blinded process allowed for participants to share their email without risk of personally identifying data being associated with their survey responses. Survey vignettes did not

include any confidential information about a real individual. There were minimal risks associated with participation. Informed consent was signed electronically by participants through Qualtrics prior to beginning survey (see Appendix C). These procedures were approved by the University of Pennsylvania Institutional Review Board.

Analysis Plan

The first set of the analyses was conducted to describe the sample as a whole. Frequencies were run for categorical and binary variable and descriptive statistics (means, standard deviations, minimum and maximum values) were run to describe continuous variables.

Hypothesis Testing

Logistic regression analyses were conducted to test the hypotheses that the experimental group (Group A) would have a higher proportion of providers who select PTSD (309.81) as the code corresponding to the clinical presentation or list PTSD as a rule-out option compared to the control group (Group B). If N_A is the total size of group A and D_A is the number of providers in group A who gave PTSD as their diagnostic code or rule-out option, the calculated proportion is $P_A = D_A / N_A$; similarly for group B (the control group): $P_B = D_B / N_B$. The hypothesized difference between groups in selecting PTSD is predicted based on the presence of disclosure of history of military service as part of the experimental vignette but not the control vignette, which was expected to increase the likelihood that PTSD will be diagnosed: $P_A > P_B$.

Dummy Variables

Prior to hypothesis testing, dummy variables for PTSD as a primary diagnosis and PTSD as a rule-out were created to transform categorical variables into binary variables for logistic regression analyses:

PTSD Diagnosis (DV)

To compare whether a PTSD diagnosis was chosen or not, a binary variable was created, with the response option "Posttraumatic Stress Disorder" coded as 1 and all other response options (Major Depressive Disorder, Persistent Depressive Disorder, Anxiety Disorder, Bipolar I and Bipolar II Disorders, and Borderline Personality Disorder) coded as 0.

PTSD Selected as rule-out option (DV)

To compare whether PTSD was selected as a rule-out option or not in the case that it was not selected as the primary diagnosis, a binary variable was created with value 1 if response option "Posttraumatic Stress Disorder" was selected as a rule-out and 0 if it was not.

Equivalency of Experimental and Control Groups

Of the sample of 366 clinicians who participated in the study, 187 (51%) were randomized to the experimental group (vignette with client identified as a Veteran) and 179 (49%) randomized into the control group (vignette with client identified as a Teacher). Chi-square tests of independence were performed to assess the equivalence of the experimental and control groups on all categorical variables (Licensure status, DSM training, Field of Highest Degree, Education Level, Theoretical Orientation, Practice

Experience with Populations, Practice Experience with Disorders, Current Practice Setting, Gender Identification, and Ethnicity) and binary regression analysis was conducted on the single continuous variable (years in practice).

The complete set of chi-square tables and binary regression analysis is provided in Appendix D. No significant differences were found between the experimental (Veteran) and control (Teacher) groups on any characteristic except for theoretical orientation (see Table D.5).

Exploratory Analysis

Since the required sample size as indicated by the power analysis was not reached, analysis of the moderators was exploratory. Exploratory analysis was conducted to determine if clinician characteristics including Licensure status, DSM training, Field of Highest Degree, Education Level, and Theoretical Orientation acted as moderators of any effect of history of military service on selection of diagnosis of PTSD. To do this, a series of 3-way chi-square tables were used to layer clinician characteristics on the original group diagnosis test used in hypothesis testing. Differences between clinician characteristic sub-groups within experimental and control groups on diagnosis of PTSD were considered evidence for moderation.

Chapter 3: Results

Sample Characteristics

A total of 366 clinicians with an average of 11 years of practice experience (*sd*=9.25) participated in the study. Seventy five percent (*n*=276) of participants reported being licensed, 70% (*n*=255) reported being trained at the Masters level, just over half reported having a degree in social work [56% (*n*=206)], and almost half reported having a cognitive-behavioral theoretical orientation [45% (*n*=165)]. Thirty four percent (*n*=126) of participants reported being trained using the fourth version of the Diagnostic and Statistics Manual (DSM-IV) and 35% (*n*=128) reported being trained using both the fourth (DSM-IV) and fifth versions (DSM-5), with a smaller percentage trained only on the DSM-5 [24% (*n*=86)]. See Table 3.1 for more details.

Table 3.1 Educational, Training and Theoretical Background of Study Participants

	Variable	Frequency	Percent
License Held	Fully Licensed	276	75.41
	Unlicensed or Provisionally Licensed	90	24.59
DSM Training	DSM-IV	126	34.43
	DSM-5	86	23.50
	Both DSM-IV and DSM-5	128	34.97
	Neither or DSM-III	26	7.10
Degree	Social Work	206	56.28
	Psychology	104	28.42
	Counseling	38	10.38
	Nursing	10	2.73
	Psychiatry	8	2.19
Education	Bachelors	9	2.46
	Masters	255	69.67
	Doctoral	102	27.87
Theoretical Orientation	Cognitive-Behavioral	165	45.08
	Eclectic	58	15.85
	Humanistic / Person Centered	43	11.75
	Psychodynamic	29	7.92
	I do not have a primary orientation	47	12.84
	Other	24	6.56

Participants reported a range of specialized clinical practice experience and current practice settings. As shown in Table 3.2, approximately half of the participants reported having specialized practice experience which included children/adolescents [53% (*n*=192)], followed by families/couples [43% (*n*=158)], and women [47% (*n*=172)]. The most common disorders participants reported having specialized practice experience with included trauma disorders [73% (*n* =268)], serious and persistent mental illness

[52% (*n*=191)], followed by affective disorders [52% (*n*=187)]. Respondents worked in a diverse set of practice settings with about a quarter working in private practice [24% (*n*=87)] settings with groups and individuals.

Table 3.2 Study Participants' Practice Experiences (Treated Populations, Disorders and Current Practice Settings)

	Variable	Frequency	Percent
Population	Child/Adolescents	192	52.46
	College Students	116	31.69
	Families/Couples	158	43.17
	Gerontology	66	18.03
	LGBT	85	23.22
	Veteran/Military	125	34.15
	Women	172	46.99
	Other	58	15.85
Disorders	Affective Disorders	187	51.09
	Compulsive / Addictive	104	28.42
	Eating Disorders	33	9.02
	Health Psychology	74	20.22
	Serious and Persistent Mental Illness	191	52.19
	Personality Disorders	152	41.53
	Substance Abuse	152	41.53
	Trauma	268	73.22
	Other	40	10.93
Setting	Individual or Group Private Practice	87	23.80
	Non-Gov Healthcare System, Inpatient or Outpatient	63	17.20
	City, County or State MH Services	33	9.00
	Federal Agency (VA, DoD, BIA, etc)	59	16.10
	Non-Profit Organization	72	19.70
	School (through 12th grade)	13	3.60
	College or University Counseling Center	9	2.50
	Other	30	8.20

As shown in Table 3.3, the majority of the sample identified as female [85% (*n*=311)] and most reported being of White/European descent [79% (*n*=288)].

Table 3.3 Demographic Characteristics of Study Participants

	Variable	Frequency	Percent
Gender ID	Female	311	84.97
	Male	54	14.75
	Non-Conforming	1	0.27
Ethnicity	Asian	6	1.64
	Black / African-American	25	6.83
	Hispanic / Latinx	19	5.19
	Pacific Islander	1	0.27
	White / European	288	78.69
	Multi-ethnic	20	5.46
	Prefer not to answer	7	1.91

Vignette Diagnosis

As shown in Table 3.4, the disorders most commonly identified for the primary diagnosis across both groups included Anxiety Disorder [30% (*n*=108)], Major Depressive Disorder [30% (*n*=108)], and Posttraumatic Stress Disorder [29% (*n*=106)]. Two-thirds of participants reported Anxiety Disorders as a rule-out diagnoses [64% (*n*=233)], with over half also reporting Major Depressive Disorder [57% (*n*=207)], and almost half listing Posttraumatic Stress Disorder [48% (*n*=177)].

Table 3.4 Primary and Rule-out Diagnoses For Total Sample

	Variable	Frequency	Percent
Diagnosis	Anxiety Disorder	108	29.51
	Bipolar I Disorder	3	0.82
	Bipolar II Disorder	6	1.64
	Borderline Personality Disorder	8	2.19
	Major Depressive Disorder	108	29.51
	Persistent Depressive Disorder	27	7.38
	Posttraumatic Stress Disorder	106	28.96
Rule-out	Anxiety Disorder	233	63.66
	Bipolar I Disorder	42	11.48
	Bipolar II Disorder	77	21.04
	Borderline Personality Disorder	53	14.48
	Major Depressive Disorder	207	56.56
	Persistent Depressive Disorder	122	33.33
	Posttraumatic Stress Disorder	177	48.36
	No Rule-outs	11	3.01

Experiment v Control: PTSD as Primary Diagnosis

Figure 3.1 summarizes the frequencies of primary diagnoses for the experimental (Veteran vignette) and control (Teacher vignette) groups. The category "All Other" is composed of diagnoses of Anxiety, Bipolar I and II Disorders, Borderline Personality Disorder and Persistent Depressive Disorder.

Of the 187 clinicians presented with the Veteran vignette, 84 (45%) identified PTSD as their primary diagnosis, while only 22 (12%) of those presented with the Teacher vignette identified PTSD as their primary diagnosis. Further, 44 (24%) and 42 (22%) of the clinicians presented with the Veteran vignette identified Anxiety Disorder

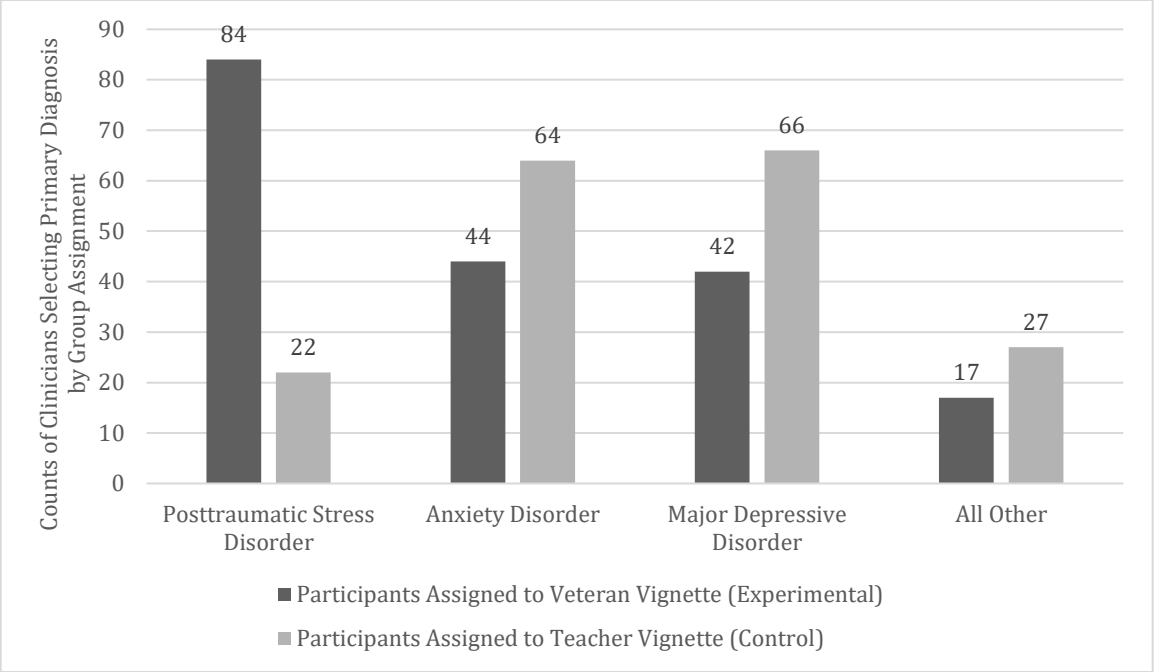

Figure 3.1 *Primary Diagnosis Frequencies by Group Assignment*

and Major Depressive Disorder respectively, compared to 64 (36%) and 66 (37%) of the clinicians presented with the Teacher vignette.

Logistic regression analysis was conducted to test the likelihood that group assignment (Veteran versus Teacher) would predict the selection of PTSD as the primary diagnosis (Table 3.5). Cases in which the client was identified as a Veteran were almost 6 times more likely to be given a primary diagnosis of PTSD than cases in which the client was identified as a Teacher [*OR*=5.82, *p*=0.00].

Table 3.5 Logistic Regression of the Likelihood of Selecting PTSD as the Primary Diagnosis in the Experimental Versus Control Group

			95% C.I. for OR	
	Odds Ratio	p-value	Lower	Upper
Group Assignment	5.82	0.00	3.42	9.90
Constant	0.14	0.00		

Experimental v Control: PTSD as a Rule-Out Diagnosis

Logistic regression analysis was conducted to test the likelihood that group assignment (Veteran versus Teacher vignette) would predict the identification of PTSD as a rule-out diagnosis. As shown in Table 3.6, the odds of reporting PTSD as a rule-out diagnosis were not significantly greater for clinicians assigned to the experimental (Veteran) group than those assigned to the control (Teacher) group [*OR*=0.69, *p*=0.08].

Table 3.6 Logistic Regression of the Likelihood of Identifying PTSD as a Rule-out Disorder in the Experimental Versus Control Group

			95% C.I. for OR	
	Odds Ratio	p-value	Lower	Upper
Group Assignment	0.69	0.08	0.46	1.04
Constant	1.13	0.41		

Exploratory Analysis

Exploratory analysis was conducted to test the possibility that clinician characteristics, including Licensure, DSM Training, Field of Highest Degree, Education Level, or Theoretical Orientation would act as moderators of the effect of group assignment (Veteran versus Teacher) on the selection of PTSD as the primary diagnosis. Only those clinician characteristics with significant results are reported.

Licensure. As seen in Table 3.7, more licensed clinicians assigned the Veteran vignette diagnosed the client with PTSD (*Std. Residuals* = 3.8) than would be expected, suggesting that the client characteristic of "Veteran" impacted the licensed clinicians'

decision to select PTSD as the primary diagnosis. Fewer licensed clinicians assigned the Teacher vignette diagnosed the client with PTSD (*Std. Residuals* = -3.9) and more diagnosed the client with Major Depressive Disorder (*Std. Residuals* = 2.0) than would be expected, suggesting that the client characteristic of "Teacher" also impacted licensed clinicians' diagnostic decisions. No more or fewer provisionally/unlicensed clinicians diagnosed the client with PTSD whether assigned the Veteran (*Std. Residuals* = 1.3) or Teacher vignette (*Std. Residuals* = -1.3).

Overall, it appears that being fully licensed impacted the selection of PTSD as the primary diagnosis based on client characteristics, while being unlicensed or provisionally licensed did not. These findings suggest a moderating effect of licensure status on the effect that client characteristics have on the diagnosis of PTSD.

Table 3.7 Chi-Square Test of Independence of Experimental Versus Control Groups on Selecting PTSD as the Primary Diagnosis by Licensure Status

		Random Assignment			
		Teacher		**Veteran**	
License Held	**Diagnosis**	Count	(Std Res)	Count	(Std Res)
Fully Licensed	Anxiety	48	(1.7)	30	(-1.6)
	Bipolar	5	(1.2)	1	(-1.2)
	Depression	61	(2.0)	37	(-1.9)
	PTSD	**17**	**(-3.9)**	**71**	**(3.8)**
	Chi-square (3, *N*=270) = 0.30, *p* = 0.00				
Unlicensed or Provisionally Licensed	Anxiety	16	(0.3)	14	(-0.3)
	Bipolar	2	(0.4)	1	(-0.4)
	Depression	21	(0.6)	16	(-0.6)
	PTSD	5	(-1.3)	13	(1.3)
	Chi-square (3, *N*=88) = 0.30, *p* = 0.00				

DSM Training. As seen in Table 3.8, more clinicians trained using DSM-IV assigned to the Veteran vignette diagnosed the client with PTSD (*Std. Residuals* = 2.8) than would be expected by chance, suggesting that the client characteristic of "Veteran" impacted the DSM-IV trained clinicians' decision to select PTSD as the primary diagnosis. Fewer clinicians trained using DSM-IV assigned the "Teacher" vignette diagnosed the client with PTSD (*Std. Residuals* = -2.8) than would be expected by chance, suggesting that the client characteristic of "Teacher" also impacted the DSM-IV trained clinicians' decision to *not* use PTSD as the primary diagnosis.

No more or fewer clinicians trained using DSM-5 diagnosed the client with PTSD whether they were assigned the "Veteran" (*Std. Residuals* = 1.4) or "Teacher" (*Std. Residuals* = -1.4) vignette than would be expected by chance, suggesting that client characteristics did not impact the DSM-5 trained clinicians' decisions to use PTSD as the primary diagnosis.

More clinicians trained using both DSM-IV and DSM-5 assigned the Veteran vignette diagnosed the client with PTSD (*Std. Residuals* = 2.5) than would be expected by chance, suggesting that the client characteristic of "Veteran" impacted the DSM-IV/DSM-5 trained clinicians' decision to use PTSD as the primary diagnosis. Fewer clinicians assigned to the Teacher vignette trained using both DSM-IV and DSM-5 diagnosed the client with PTSD (*Std. Residuals* = -2.3) than would be expected by chance, suggesting that the client characteristic of "Teacher" impacted the DSM-IV/DSM-5 trained clinicians' decision to not select PTSD as the primary diagnosis.

Overall, it appears that being trained on the DSM-IV, whether alone or with the DSM-5, increases the likelihood of selecting PTSD as the primary diagnosis based on

client characteristics. It does not appear to be the case for clinicians trained using only the DSM-5. These findings suggest that the version of the DSM with which clinicians were trained moderated the effect of client characteristics on selecting PTSD as the primary diagnosis.

Table 3.8 Chi-Square Test of Independence of Experimental Versus Control Group on Selecting PTSD as the Primary Diagnosis by DSM Training

		Random Assignment			
		Teacher		**Veteran**	
Training	**Diagnosis**	Count	(Std Res)	Count	(Std Res)
DSM-IV	Anxiety	26	(1.5)	13	(-1.5)
	Bipolar	1	(0.7)	0	(-0.7)
	Depression	28	(1.0)	19	(-1.0)
	PTSD	**6**	**(-2.8)**	**30**	**(2.8)**
	Chi-square (3, *N*=123) = 0.35, *p* = 0.00				
DSM-5	Anxiety	16	(0.9)	11	(-0.8)
	Bipolar	1	(-0.4)	2	(0.3)
	Depression	18	(0.3)	17	(-0.3)
	PTSD	5	(-1.3)	14	(1.3)
	Chi-square (3, *N*=84) = 0.20, *p* = 0.07				
Both DSM-IV and DSM-5	Anxiety	19	(0.2)	15	(-0.3)
	Bipolar	5	(1.5)	0	(-1.5)
	Depression	32	(1.4)	15	(-1.5)
	PTSD	**10**	**(-2.3)**	**29**	**(2.5)**
	Chi-square (3, *N*=26) = 0.22, *p* = 0.01				

Theoretical Orientation. As seen in Table 3.9, more clinicians with a Cognitive-Behavioral orientation assigned to the Veteran vignette diagnosed the client with PTSD (*Std. Residuals* = 3.3) than would be expected by chance, suggesting that the client

characteristic of “Veteran” impacted the Cognitive-Behavioral oriented clinicians’ decision to use PTSD as the primary diagnosis. Fewer clinicians with a Cognitive-Behavioral orientation assigned the Teacher vignette diagnosed the client with PTSD (*Std. Residuals* = -3.4) than would be expected by chance, suggesting that the client characteristic of “Teacher” impacted the Cognitive-Behavioral orientated clinicians’ decision to *not* use PTSD as the primary diagnosis.

No more or fewer clinicians with an Eclectic orientation assigned the Veteran vignette diagnosed the client with PTSD (*Std. Residuals* = 1.9) than would be expected by chance, suggesting that the client characteristic of “Veteran” did not impact the Eclectic oriented clinicians’ decision to use PTSD as the primary diagnosis. Fewer clinicians with an Eclectic orientation assigned to the Teacher vignette diagnosed the client with PTSD (*Std. Residuals* = -2.2) than would be expected, suggesting that the client characteristic of “Teacher” impacted the Eclectic oriented clinicians’ decision to use or not use PTSD as the primary diagnosis.

No more or fewer clinicians with a Human/Person Centered orientation diagnosed the client with PTSD whether they were assigned the Veteran (*Std. Residuals*=0.4) or Teacher (*Std. Residuals*= -0.5) than would be expected by chance, suggesting that client characteristics did not impact the Human/Person Centered clinicians’ decision to use or not use PTSD as the primary diagnosis.

No more or fewer clinicians with a Psychodynamic orientation diagnosed the client with PTSD whether they were assigned the Veteran (*Std. Residuals* = 0.9) or Teacher (*Std. Residuals* = -0.9) than would be expected, suggesting that the client

characteristic did not impact the Psychodynamic oriented clinicians' decision to use or not use PTSD as the primary diagnosis.

Overall, it appears that having a Cognitive-Behavioral orientation increases the likelihood of diagnosing PTSD based on the Veteran client characteristic. It does not appear to be the case for those with an Eclectic, Humanistic/Person Centered or Psychodynamic orientation. These findings suggest a moderating effect of theoretical orientation on the impact of client characteristics on the diagnosis of PTSD.

Table 3.9 Chi-Square Test of Independence of Experimental Versus Control Groups on Selecting PTSD as the Primary Diagnosis by Theoretical Orientation

		Random Assignment			
		Teacher		**Veteran**	
Orientation	**Diagnosis**	Count	(Std Res)	Count	(Std Res)
Cognitive-Behavioral	Anxiety	30	(1.4)	17	(-1.4)
	Bipolar	3	(1.3)	0	(-1.2)
	Depression	38	(1.6)	22	(-1.5)
	PTSD	**8**	**(-3.4)**	**43**	**(3.3)**
	Chi-square (3, *N*=161) = 0.34, *p* = 0.00				
Eclectic	Anxiety	8	(0.7)	7	(-0.6)
	Depression	13	(1.7)	7	(-1.4)
	PTSD	**2**	**(-2.3)**	**19**	**(1.9)**
	Chi-square (3, *N*=56) = 0.10, *p* = 0.00				
Humanistic / Person Centered	Anxiety	6	(-0.2)	9	(0.1)
	Bipolar	0	(-0.7)	1	(0.6)
	Depression	8	(0.8)	6	(-0.7)
	PTSD	4	(-0.5)	8	(0.4)
	Chi-square (3, *N*=42) = -0.10, *p* = 0.89				
Psychodynamic	Anxiety	6	(0.3)	5	(-0.3)
	Bipolar	1	(0.7)	0	(-0.7)
	Depression	5	(0.3)	4	(-0.3)
	PTSD	2	(-0.9)	6	(0.9)
	Chi-square (3, *N*=22) = 0.27, *p* = 0.24				

Chapter 4: Discussion and Conclusion

This study set out to test the impact of a single non-symptom variable on mental health diagnosis. We sought to identify, specifically, if the designation of "veteran" or "teacher" in an otherwise identical case presentation would impact diagnosis. The study vignettes were drafted such that symptoms were described vaguely, and made no mention of traumatic exposure, arguably the cornerstone symptom of PTSD and it was hypothesized that the designation of "veteran" would lead to higher diagnoses of PTSD than would the designation of "teacher". The hypothesis was supported: case vignettes where the client was identified as a veteran were 6-times more likely to be diagnosed with PTSD than those vignettes where the client was identified as a teacher. Additional findings of interest indicated clinicians' diagnostic judgement were moderated by time in practice and professional training in DSM and Cognitive-Behavioral Theoretical Orientation.

It is potentially not surprising that study participants would read the vignette about a veteran seeking treatment for vague mental health concerns and select PTSD as the likely issue. PTSD has routinely been described as the signature injury of OEF/OIF. The psychological impact of war has been studied extensively, with a significant portion of research focusing specifically on posttraumatic stress disorder. But the strength of the relationship between the variables of "veteran" and "PTSD" point to some of the current challenges in veteran's mental health care. Service members and veterans have been found to experience depressive and anxiety disorders at an equal, if not greater, rate to PTSD (Deployment Health Clinical Center, Defense Centers of Excellence for Psychological Health and Traumatic Brain Injury Center, 2017).

Though PTSD prevalence rates are controversial and varied, the epidemiological data typically supports depression and PTSD occurring at an equivalent rate (Ramchand, Rudavsky, Grant, Tanielian, & Jaycox, 2015). If evidence-based treatments for PTSD were identical to evidence-based treatments for other common disorders in military personnel, effectively differentiating between disorders might not be as essential. This isn't the case. Effective treatments for PTSD are significantly different from evidence-based treatments for depression and therefore effective diagnostic differentiation is essential.

There are a number of factors that might contribute to the strength of association between "veteran" and "PTSD." In this study, three-quarters of the study participants reported having primary experience treating trauma-related disorders. The relationship between the high number of clinicians identifying PTSD for a veteran vignette and the high number of clinicians reporting trauma-focused clinical practice is non-trivial. As noted earlier in this paper, "representativeness" was one of the earliest heuristics described. Understood this way, veteran status represents a potentially trauma-exposed individual more than teacher status. With clinical heuristics and bias well documented in the literature, the findings here add evidence that veteran status has a powerful effect on diagnosis, disproportionately impacting diagnosis beyond the scope of clinical cues presented in the vignette. As noted previously, doctors and clinicians routinely use shortcuts in critical thinking in order to be able to sort through large volumes of information and make diagnostic assessments and determinations based on limited data. One question for future research then is, is veteran status becoming a functioning heuristic for PTSD?

In the exploratory analysis we found the impact of veteran status on the diagnosis of PTSD was moderated by clinician characteristics associated with training and licensure. Licensed clinicians assigned the veteran vignette were significantly more likely to diagnose PTSD than unlicensed clinicians assigned the same vignette. These findings are also consistent with early research of diagnostic accuracy based on time in practice. As noted earlier in this paper, clinical judgment is varied and not directly related to time in practice or training background. Clinicians do not necessarily become more accurate over time and instead, possibly become less likely to integrate new findings and new practice guidelines into their practice as they become habitual and entrenched in clinical patterns.

Clinicians assigned the veteran vignette who were trained using DSM-IV were significantly more likely to diagnose PTSD than clinicians presented with the same vignette who trained under the DSM-5. Clinicians trained under DSM-5 were not swayed by the inclusion of veteran status and did not appear to mis-categorize it as symptom data. The neutrality through which clinicians trained specifically under DSM-5 viewed veteran status supports arguments made by the DSM-5 working group on PTSD that clearer definitions of a traumatic stressor, or Criterion A event, were needed and would limit diagnostic variability (Friedman, 2013).

There are a number of reasons it is important to understand how veteran status might impact clinical diagnosis. While it would be impossible to have a discussion of veterans' mental health without a significant focus on PTSD, it remains that depression, anxiety, and TBI are all significant issues, with depression occurring at rates equal or greater than PTSD for veterans. In spite of well-validated diagnostic and assessment tools

and evidence-based treatments, PTSD diagnosis and treatment can be challenging. It should help that a PTSD diagnosis requires a specific event, a stressor of significant and well-described magnitude, and the subsequent symptoms are nosologically related to the traumatic event. That said, the respondents in this study did not find the absence of a traumatic event essential.

Future research is required to better understand to what extent the traumatic stressor criterion is actually valued in real world practice. Further, it is an interesting question of what drives the association of veteran status with PTSD. Veterans who have deployed have a higher traumatic-event exposure prevalence, and this may lead to some automatic associations for clinicians, in spite of the moderate-to-low likelihood that trauma exposure leads to PTSD. It is also possible that clinicians are guided by beliefs about military and combat that inform their clinical judgment and assume a high prevalence of trauma.

Even without having a clear understanding of the reasons behind the causal linkage between “veteran” and “PTSD,” these findings point to the importance of the use of validated assessment measures in diagnosis. Incorporation of objective assessment measures can improve diagnostic accuracy across DSM categories. Specific to PTSD objective, validated assessment tools such as the Clinician Administered PTSD Scale, the Life-Events Checklist, and the Combat Exposure Scale should be broadly considered as a means of limiting subjectivity in the diagnostic process (Weathers, Blake, Schnurr, Kaloupek, Marx & Keane, 2012; Weathers, Blake, Schnurr, Kaloupek, Marx & Keane, 2013; Keane, Fairbank, Caddell, Zimering, Taylor, Mora 1989). As noted in a thorough evaluation of practices and attitudes in the assessment of PTSD, there is wide variability

in how clinicians assess for PTSD, with a significant majority responding that they are unlikely to use validated assessment measures (Jackson et., al., 2011). But these findings imply that the absence of an index trauma, at least in an initial clinical assessment, is under-valued as important or relevant clinical information.

An emphasis on validated assessment measures is important from a policy perspective, as well. Disability awards for PTSD far exceed all other mental health disability ratings associated with military service (Marx, et al., 2016). A number of studies have outlined PTSD-specific challenges in the current VA disability benefits process. During a 2005 review conducted by the VA Office of the Inspector General, 25% of the veterans awarded disability pensions for PTSD were lacking compelling medical evidence, including evidence of exposure to combat or trauma during military service (Freuh, Grubaugh, Elhai, & Buckley, 2007). The Compensation and Pension (C&P) has been scrutinized for not consistently adhering to best practice guidelines in evidence-based assessment, including validated assessment measures and Structured Clinical Interviews (Institute of Medicine, 2007; Russo, 2014). In an evaluation of the extent to which veterans service connection status corresponded to their diagnostic status researchers noted an alarming discordance between diagnostic and service connection status (Marx, et al., 2016).

While there have been ample studies conducted over the last two decades evaluating potential symptom overreporting and malingering by veterans seeking PTSD compensation, the present study findings support additional analysis on clinician-driven factors in diagnostic variation of PTSD. Clinicians conducting disability benefit assessments are responsible for identifying the experience that qualifies as meeting the

threshold for criterion A. The findings of this study, at least preliminarily, point to a more complex systematic issue than simple symptom over-reporting. Clinician characteristics and clinical practice approach might have a significant impact on the current state of the disability rating system for PTSD particularly if clinicians are not objectively valuing the presence or absence of a traumatic-stressor.

Implications for Social Work Practice

Social work education has long been involved in improving resources and care available to veterans and service members. In 2010 the Council on Social Work Education (CSWE) published guidelines for advanced practice in military social work. The core competencies described were updated again in 2018 (CSWE, 2018). Military social work and social work education in general has been responsible for significant improvements in programming, intervention, assessment and services. The CSWE guidelines reference the ethical responsibilities held by institutions focusing on military social work practice. The guidelines note the importance of:

> Balancing a strength-based treatment orientation with an increasingly disability-focused benefit system. There is an incredibly complex situation that continues to grow and morph around service-related disabilities and lifetime disability ratings for PTSD. Within this complex issue there are micro, mezzo, and macro challenges; questions about ethics; and questions about how our own beliefs and worldviews might affect how we care for our wounded, ill, and injured veterans (CSWE, 2018, p. xix).

The present study's findings support the significant role social work education in general, and military social work programs specifically in high quality training in clinical assessment and military-culturally competent care. Programs focused on quality clinical training should integrate strong emphasis on evidence-based assessment and clinician awareness of non-clinical factors and how they impact diagnostic decision making. Clinical training programs should be grounded in the most current and well-supported evidence.

Study Limitations

This study has several limitations which must be considered when reviewing these findings. Fictional case vignettes have been identified as helpful in assessing general clinical decision-making skills, but they do not accurately capture or reflect real-world clinical decision making. It is entirely possible that, while veteran status was overly-influential in a brief case review, real world diagnostic practice would place more emphasis on identifying a specific and relevant index trauma and PTSD-specific symptoms. Literature suggests that surveys and studies relying on clinical vignettes may be particularly vulnerable to social desirability bias (Peabody, Luck, Glassman, Dresselhaus, & Lee, 2000). Additionally, because veterans have higher base rates of trauma exposure than teachers, it is possible the survey results reflect clinicians 'playing the odds.' A single, brief vignette study does not allow for complex analysis of diagnostic decision making and we are unable to establish if the diagnostic conclusions of our participants conclusively demonstrate biased thinking or simple probabilistic reasoning.

The assignment of a profession, teacher, to the control group was intended to simply balance the vignettes. However, study respondents assigned to the control group, the "teacher" vignette, selected a diagnosis of depression at a greater rate than would be expected by chance. Though the survey was initially drafted to isolate veteran status as the sole variable under examination, it is clear that there is more to learn about the impact of "profession" in general. Finally, for the purpose of analyzing the moderating impact of clinician characteristics, the required sample size as indicated by the power analysis was not reached and analysis of the moderators was exploratory.

Considerations for future research

The findings highlighted the significant extent to which non-clinical factors are integrated into diagnostic decision-making. Additional research is needed to better understand the drivers of diagnostic decision making, including clinician and client characteristics. Future studies should include qualitative assessments of clinicians to further assess how beliefs about military service influence diagnosis. Moreover, a larger sample size of a broader range of providers across professional disciplines might be able to better evaluate what factors influence the weighting of non-symptom information in early clinical assessment.

Furthermore, a tremendous effort has been undertaken by the Veterans Administration and DoD to ensure evidence-based treatments are available and specific to PTSD. Some researchers have used high rates of treatment attrition as evidence that the treatments themselves are ineffective for a broad population (Steenkamp & Litz, 2014). Our findings support a broader analysis of treatment attrition and dropout to

evaluate for the possibility that PTSD is at times diagnosed even in the absence of a qualifying traumatic event, with inappropriate clients subsequently entered into PTSD treatment.

Conclusion

In spite of the study limitations, the findings support a strong connection between veteran status and the likelihood of a PTSD diagnosis. Given the continued relevance of improving treatment access and mental health outcomes for veterans, these present findings offer support for the utilization of objective assessment measures and ensuring all diagnostic possibilities are appropriately assessed for. There will be value in continued research to better understand drivers of clinical decision-making.

References

Abreu, J. M. (1999). Conscious and nonconscious african american stereotypes: Impact on first impression and diagnostic ratings by therapists. *Journal of Consulting and Clinical Psychology, 67*(3), 387.

American Psychiatric Association. (2000). *Diagnostic and statistical manual of mental disorders: DSM-IV.* American Psychiatric Association.

American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders: 5* American Psychiatric Association.

Arkes, H. R. (1981). Impediments to accurate clinical judgment and possible ways to minimize their impact. *Journal of Consulting and Clinical Psychology, 49*(3), 323-330. 10.1037/0022-006X.49.3.323

Armstrong, D., Gosling, A., Weinman, J., & Marteau, T. (1997). The place of inter-rater reliability in qualitative research: An empirical study. *Sociology, 31*(3), 597-606.

Baglioni, C., Battagliese, G., Feige, B., Spiegelhalder, K., Nissen, C., Voderholzer, U., . . . Riemann, D. (2011). Insomnia as a predictor of depression: A meta-analytic evaluation of longitudinal epidemiological studies. *Journal of Affective Disorders, 135*(1-3), 10-19. 10.1016/j.jad.2011.01.011 [doi]

Bandura, A. (1969). Principles of behavior modification.

Basco, M. R., Bostic, J. Q., Davies, D., Rush, A. J., Witte, B., Hendrickse, W., & Barnett, V. (2000). Methods to improve diagnostic accuracy in a community mental health setting. *American Journal of Psychiatry, 157*(10), 1599-1605.

Bloom, S. W., & Bloom, S. W. (1963). The doctor and his patient: A sociological interpretation.

Blumenthal-Barby, J. S., & Krieger, H. (2015). Cognitive biases and heuristics in medical decision making: A critical review using a systematic search strategy. *Medical Decision Making : An International Journal of the Society for Medical Decision Making, 35*(4), 539-557. 10.1177/0272989X14547740 [doi]

Bodkin, J. A., Pope, H. G., Detke, M. J., & Hudson, J. I. (2007a). Is PTSD caused by traumatic stress? *Journal of Anxiety Disorders, 21*(2), 176-182.

Bodkin, J. A., Pope, H. G., Detke, M. J., & Hudson, J. I. (2007b). Is PTSD caused by traumatic stress? *Journal of Anxiety Disorders, 21*(2), 176-182. 10.1016/j.janxdis.2006.09.004

Bonanno, G. A. (2004). Loss, trauma, and human resilience: Have we underestimated the human capacity to thrive after extremely aversive events? *American Psychologist, 59*(1), 20-28. 10.1037/0003-066X.59.1.20

Bornstein, R. F. (1989). Exposure and Affect: Overview and Meta-Analysis of Research, 1968–1987.,

Bower, G. H. (1981). Mood and memory. *American Psychologist, 36*(2), 129.

Breslau, N., Alvarado, G. F. (2007). The clinical significance criterion in DSM-IV post-traumatic stress disorder. *Psychological Medicine, 37*(10), 1437-1444. 10.1017/S0033291707000426

Brewin, C. R., & Holmes, E. A. (2003). Psychological theories of posttraumatic stress disorder. *Clinical Psychology Review, 23*(3), 339-376.

Brewin, C., Lanius, R., Novac, A., Schnyder, U., & Galea, S. (2009). Reformulating PTSD for DSM-V: Life after Criterion A. *Journal of traumatic stress, 22*(5), 366-373.

Bruchmuller, K. & Meyer, T. (2009). Diagnostically irrelevant information can affect the likelihood of a diagnosis of bipolar disorder. *Journal of Affective Disorders, 116,* 148-151.

Chen, H., Cohen, P., & Chen, S. (2009). How Big is a Big Odds Ratio? Interpreting the Magnitudes of Odds Ratios in Epidemiological Studies. Communication in Statistics – Simulation and Computation, 39 (4), 869-876

Cohen, J. (1992). Quantitative Methods in Psychology: A power primer, *Psychological Bulletin, 112,* 155-159.

Croskerry, P. (2002). Achieving quality in clinical decision making: Cognitive strategies and detection of bias. *Academic Emergency Medicine, 9*(11), 1184-1204.

Cunningham, C., Quan, H., Hemmelgarn, B., Noseworthy, T., Beck, C., Dixon, E. et al., (2015). Exploring physician specialist response rates to web-based surveys. *BMC Medical Research Methodology, 15,* 32-39.

Di Nardo, P. A. (1975). Social class and diagnostic suggestion as variables in clinical judgment. *Journal of Consulting and Clinical Psychology, 43*(3), 363.

Dohrenwend, B. P., Turner, J. B., Turse, N. A., Adams, B. G., Koenen, K. C., & Marshall, R. (2006). The psychological risks of vietnam for U.S. veterans: A revisit with new data and methods. *Science (New York, N.Y.), 313*(5789), 979-982. 313/5789/979 [pii]

Dumont, F. (1993). Inferential heuristics in clinical problem formulation: Selective review of their strengths and weaknesses. *Professional Psychology: Research and Practice, 24*(2), 196.

Ellis, M. V., Robbins, E. S., Schult, D., Ladany, N., & Banker, J. (1990). Anchoring errors in clinical judgments: Type I error, adjustment, or mitigation? *Journal of Counseling Psychology, 37*(3), 343.

Elstein, A. S. (1999). *Heuristics and biases: Selected errors in clinical reasoning*. Philadelphia, Pa. : Hanley & Belfus.

Evans, S. C., Roberts, M. C., Keeley, J. W., Blossom, J. B., Amaro, C. M., Garcia, A. M., Reed, G. M. (2015). Vignette methodologies for studying clinicians' decision-making: Validity, utility, and application in ICD-11 field studies. *International Journal of Clinical and Health Psychology, 15*(2), 160-170. 10.1016/j.ijchp.2014.12.001

Faust, D., Guilmette, T., Hart, K., Arkes, H., Fishburne, F., & Davey, L. (1988, January). Neuropsychologists' training, experience, and judgment accuracy. *Archives of Clinical Neuropsychology, 3*(2), 145-163.

Fiske, S. T., & Taylor, S. E. (2013). *Social cognition: From brains to culture* Sage.

Friedlander, L., & Stockman, J. (1983). Anchoring and publicity effects in clinical judgment. *Journal of Clinical Psychology, 39*(4), 637-643. 10.1002/1097-4679(198307)39:43.0.CO;2-Q

Friedman, M. (2013). Finalizing PTSD in DSM-5: Getting here from there and where to go next. *Journal of Traumatic Stress, 25*(5), 548-556.

Friedman, M. J., Resick, P. A., Bryant, R. A., Strain, J., Horowitz, M., & Spiegel, D. (2011). Classification of trauma and stressor-related disorders in DSM-5. *Depression and Anxiety, 28*(9), 737-749.

Friedman, M. J., Resick, P. A., Resick, P. A., Bryant, R. A., & Brewin, C. R. (2011). Considering PTSD for DSM-5. *Depression and Anxiety, 28*(9), 750-769.

Galea, S., Basham, K., Culpepper, L., Davidson, J., Foa, E., Kizer, K., McCormick, R. (2012). Treatment for posttraumatic stress disorder in military and veteran populations: Initial assessment. *Washington, DC: The National Academies,*

Garb, H. N. (1994). Cognitive heuristics and biases in personality assessment. *Applications of heuristics and biases to social issues* (pp. 73-90) Springer.

Garb, H. N. (2005). Clinical judgment and decision making. *Annu.Rev.Clin.Psychol.2005, 1*, 67-89.

Goodyear, R., Lichtenberg, J., Hutman, H., Overland, E., Bedi, R., Christiani, K., Di Mattia, M., du Preez, E. et al. (2016). A global portrait of counselling psychologists' characteristics, perspectives, and professional behaviors. *Counselling Psychology Quarterly, 29*, 115–138.

Gravely, A. A., Cutting, A., Nugent, S., Grill, J., Carlson, K., & Spoont, M. (2011). Validity of PTSD diagnoses in VA administrative data: Comparison of VA administrative PTSD diagnoses to self-reported PTSD checklist scores. *Journal of Rehabilitation Research and Development, 48*(1), 21-30. 10.1682/JRRD.2009.08.0116

Guina, J., Rossetter, S. R., DeRhodes, B. J., Nahhas, R. W., & Welton, R. S. (2015). Benzodiazepines for PTSD: A systematic review and meta-analysis. *Journal of Psychiatric Practice®, 21*(4), 281-303.

Hajjaj, F. M., Salek, M. S., Basra, M. K., & Finlay, A. Y. (2010). Non-clinical influences on clinical decision-making: A major challenge to evidence-based practice. *Journal of the Royal Society of Medicine, 103*(5), 178-187. 10.1258/jrsm.2010.100104 [doi]

Hall, W. J., Chapman, M. V., Lee, K. M., Merino, Y. M., Thomas, T. W., Payne, B. K., . . . Coyne-Beasley, T. (2015). Implicit racial/ethnic bias among health care professionals and its influence on health care outcomes: A systematic review. *American Journal of Public Health, 105*(12), e60-e76.

Harding, T. P. (2004). Psychiatric disability and clinical decision making: The impact of judgment error and bias. *Clinical Psychology Review, 24*(6), 707-729.

Harned, M. S., Korslund, K. E., Foa, E. B., & Linehan, M. M. (2012). Treating PTSD in suicidal and self-injuring women with borderline personality disorder: Development and preliminary evaluation of a Dialectical Behavior Therapy Prolonged Exposure Protocol. *Behaviour Research and Therapy, 50*(6), 381-386.

Hartung, C. M., & Widiger, T. A. (1998). Gender differences in the diagnosis of mental disorders: Conclusions and controversies of the DSM–IV. *Psychological Bulletin, 123*(3), 260.

Hoge, C. W., Riviere, L. A., Wilk, J. E., Herrell, R. K., & Weathers, F. W. (2014). The prevalence of post-traumatic stress disorder (PTSD) in US combat soldiers: A head-to-head comparison of DSM-5 versus DSM-IV-TR symptom criteria with the PTSD checklist. *The Lancet Psychiatry, 1*(4), 269-277.

Hoge, C. W., Yehuda, R., Castro, C. A., McFarlane, A. C., Vermetten, E., Jetly, R., Rauch, S. A. (2016). Unintended consequences of changing the definition of posttraumatic stress disorder in DSM-5: Critique and call for action. *JAMA Psychiatry,*

Holdeman, T. C. (2009). Invisible wounds of war: Psychological and cognitive injuries, their consequences, and services to assist recovery. *Psychiatric Services, 60*(2), 273.

Høye, A., Rezvy, G., Hansen, V., & Olstad, R. (2006). The effect of gender in diagnosing early schizophrenia: An experimental case simulation study. *Social Psychiatry and Psychiatric Epidemiology, 41*, 549-555.

Hughes, R. (02). The application of vignettes in social and nursing research. *Journal of Advanced Nursing, 37*(4), 382; 382-386; 386.

Inman, D. J., Silver, S. M., & Doghramji, K. (1990). Sleep disturbance in post-traumatic stress disorder: A comparison with non-PTSD insomnia. *Journal of Traumatic Stress, 3*(3), 429-437.

Isen, A. M. (1984). Toward understanding the role of affect in cognition.

Jackson, J. C., Sinnott, P. L., Marx, B. P., Murdoch, M., Sayer, N. A., Alvarez, J. M., . . . Speroff, T. (2011). Variation in practices and attitudes of clinicians assessing PTSD-related disability among veterans. *Journal of Traumatic Stress, 24*(5), 609-613. 10.1002/jts.20688

Kaplan, M. (1983). A woman's view of DSM-III. *American Psychologist, 38*(7), 786.

Keane, T. M., Taylor, K. L., & Penk, W. E. (1997). Differentiating post-traumatic stress disorder (PTSD) from major depression (MDD) and generalized anxiety disorder (GAD). *Journal of Anxiety Disorders, 11*(3), 317-328. 10.1016/S0887-6185(97)00013-3

Keane, T.M., Fairbank, J.A., Caddell, J.M., Zimering, R.T., Taylor, K.L., & Mora, C. (1989). Clinical evaluation of a measure to assess combat exposure (PDF). *Psychological Assessment*, 1, 53-55

Kihlstrom, J. F. (1990). The psychological unconscious. *Handbook of Personality.Theory and Research*, 424-442.

Kilpatrick, D. G., Resnick, H. S., Milanak, M. E., Miller, M. W., Keyes, K. M., & Friedman, M. J. (2013). National estimates of exposure to traumatic events and PTSD prevalence using DSM-IV and DSM-5 criteria. *Journal of Traumatic Stress, 26*(5), 537-547.

Kilpatrick, D. G., Ruggiero, K. J., Acierno, R., Saunders, B. E., Resnick, H. S., & Best, C. L. (2003). Violence and Risk of PTSD, Major Depression, Substance Abuse/Dependence, and Comorbidity: Results From the National Survey of Adolescents. *Journal of Consulting and Clinical Psychology, 71*(4), 692-700.

Kim, N. S., & Ahn, W. (2002). Clinical psychologists' theory-based representations of mental disorders predict their diagnostic reasoning and memory. *Journal of Experimental Psychology: General, 131*(4), 451.

Kolk, B., & Najavits, L. M. (2013). Interview: What is PTSD really? surprises, twists of history, and the politics of diagnosis and treatment. *Journal of Clinical Psychology, 69*(5), 516-522.

Laguilles, J. S., Williams, E. A., & Saunders, D. B. (2011). Can lottery incentives boost web survey response rates? findings from four experiments. *Research in Higher Education, 52*(5), 537-553.

Litz, B. T. (2003). A taxonomy of emotional functioning problems: A good idea in need of more research. *Clinical Psychology: Science and Practice, 10*(2), 239-244. 10.1093/clipsy.bpg014

Litz, B. T. (2005). Has resilience to severe trauma been underestimated? *American Psychologist, 60*(3), 262. 10.1037/0003-066X.60.3.262a

Litz, B. T. (2007). Research on the impact of military trauma: Current status and future directions. *Military Psychology, 19*(3), 217. 10.1080/08995600701386358

Lobbrecht, J., Wicherts, J. M., Morina, N., & Priebe, S. (2014). Remission from post-traumatic stress disorder in adults: A systematic review and meta-analysis of long term outcome studies. *Clinical Psychology Review, 34*(3), 249-255. 10.1016/j.cpr.2014.03.002

Lund, B. C., Abrams, T. E., Bernardy, N. C., Alexander, B., & Friedman, M. J. (2014). Benzodiazepine prescribing variation and clinical uncertainty in treating posttraumatic stress disorder. *Psychiatric Services,*

Magruder, K. M., & Yeager, D. E. (2008). Patient factors relating to detection of posttraumatic stress disorder in department of veterans affairs primary care settings. *Journal of Rehabilitation Research and Development, 45*(3), 371.

Marx, B. (2009). Posttraumatic stress disorder and operations enduring freedom and iraqi freedom: Progress in a time of controversy. *Clinical Psychology Review, 29*(8), 671-672, 673.

Marx, B. P., Jackson, J. C., Schnurr, P. P., Murdoch, M., Sayer, N. A., Keane, T. M., . . . Speroff, T. (2012). The reality of malingered PTSD among veterans: Reply to McNally and frueh (2012). *Journal of Traumatic Stress, 25*(4), 457-460. 10.1002/jts.21714

McDonald, S. D., & Calhoun, P. S. (2010). The diagnostic accuracy of the PTSD checklist: A critical review. *Clinical Psychology Review, 30*(8), 976-987. 10.1016/j.cpr.2010.06.012

McNally, R. J. (2003). Progress and controversy in the study of posttraumatic stress disorder. *Annual Review of Psychology, 54*(1), 229-252. 10.1146/annurev.psych.54.101601.145112

McNally, R. J. (2012). The ontology of posttraumatic stress disorder: Natural kind, social construction, or causal system? *Clinical Psychology: Science and Practice, 19*(3), 220-228. 10.1111/cpsp.12001

McNally, R. J., & Frueh, B. C. (2013). Why are iraq and afghanistan war veterans seeking PTSD disability compensation at unprecedented rates? *Journal of Anxiety Disorders, 27*(5), 520-526. 10.1016/j.janxdis.2013.07.002

Mendel, R., Traut-Mattausch, E., Jonas, E., Leucht, S., Kane, J. M., Maino, K., . . . Hamann, J. (2011). Confirmation bias: Why psychiatrists stick to wrong preliminary diagnoses. *Psychological Medicine, 41*(12), 2651-2659. 10.1017/S0033291711000808

Miller, P. R., Dasher, R., Collins, R., Griffiths, P., & Brown, F. (2001). *Inpatient diagnostic assessments: 1. accuracy of structured vs. unstructured interviews*. Amsterdam]: Elsevier/North Holland Biomedical Press.10.1016/S0165-1781(01)00317-1

Mohamed, S., & Rosenheck, R. (2008a). Pharmacotherapy for older veterans diagnosed with posttraumatic stress disorder in veterans administration. *The American Journal of Geriatric Psychiatry, 16*(10), 804-812. 10.1097/JGP.0b013e318173f617

Mohamed, S., & Rosenheck, R. A. (2008b). Pharmacotherapy of PTSD in the U.S. department of veterans affairs: Diagnostic- and symptom-guided drug selection. *The Journal of Clinical Psychiatry, 69*(6), 959.

Nelson, A. R., Stith, A. Y., & Smedley, B. D. (2002). Unequal treatment: Confronting racial and ethnic disparities in health care (full printed version) National Academies Press.

Ramchand, R., Schell, T. L., Karney, B. R., Osilla, K. C., Burns, R. M., & Caldarone, L. B. (2010). Disparate prevalence estimates of PTSD among service members who served in iraq and afghanistan: Possible explanations. *Journal of Traumatic Stress, 23*(1), 59-68.

Ramchand, R., Schell, T., Karney, B., Osilla, K. C., Burns, R., & Caldarone, L. (2010, Feb). Disparate Prevalence Estimates of PTSD Among Service Members Who Served in Iraq and Afghanistan: Possible Explanations. *Journal of Traumatic Stress, 23*(1), 59-66.

Richardson, L. K., Frueh, B. C., & Acierno, R. (2010). Prevalence estimates of combat-related post-traumatic stress disorder: Critical review. *Australian & New Zealand Journal of Psychiatry, 44*(1), 4-19.

Richardson, R., Rumbaugh Jr, W. D., & Zembrzuska, H. (2015). The multifactorial approach to PTSD in the active duty military population. *Posttraumatic stress disorder and related diseases in combat veterans* (pp. 225-231) Springer.

Rosen, G. M., Frueh, B. C., Lilienfeld, S. O., McHugh, P. R., & Spitzer, R. L. (2012). *Afterword: PTSD's Future in the DSM: Implications for Clinical Practice*. Retrieved 10 4, 2018, from http://onlinelibrary.wiley.com/doi/10.1002/9781118269961.after/pdf

Rosen, C. S., Greenbaum, M. A., Schnurr, P. P., Holmes, T. H., Brennan, P. L., & Friedman, M. J. (2013). Do benzodiazepines reduce the effectiveness of exposure therapy for posttraumatic stress disorder? *The Journal of Clinical Psychiatry, 74*(12), 1241-1248. 10.4088/JCP.13m08592 [doi]

Rosen, G. M., Spitzer, R. L., & McHugh, P. R. (2008). Problems with the post-traumatic stress disorder diagnosis and its future in DSM V. *The British Journal of Psychiatry : The Journal of Mental Science, 192*(1), 3-4. 10.1192/bjp.bp.107.043083 [doi]

Rosen, G. M., & Lilienfeld, S. O. (2008). Posttraumatic stress disorder: An empirical evaluation of core assumptions. *Clinical Psychology Review, 28*(5), 837-868. 10.1016/j.cpr.2007.12.002

Rosen, G. M., Lilienfeld, S. O., Frueh, B. C., McHugh, P. R., & Spitzer, R. L. (2010). Reflections on PTSD's future in DSM-V. *The British Journal of Psychiatry : The Journal of Mental Science, 197*(5), 343-344. 10.1192/bjp.bp.110.079699

Sauermann, H., & Roach, M. (2013). Increasing web survey response rates in innovation research: An experimental study of static and dynamic contact design features. *Research Policy, 42*(1), 273-286.

Schillaci, J., Yanasak, E., Adams, J. H., Dunn, N. J., Rehm, L. P., & Hamilton, J. D. (2009). Guidelines for differential diagnoses in a population with posttraumatic stress disorder. *Professional Psychology: Research and Practice, 40*(1), 39-45. 10.1037/a0013910

Shorter, E. (2013). The history of DSM. *Making the DSM-5* (pp. 3-19) Springer.

Slovic, P., Finucane, M. L., Peters, E., & MacGregor, D. G. (2007). The affect heuristic. *European Journal of Operational Research, 177*(3), 1333-1352.

Spitzer, R. L., First, M. B., & Wakefield, J. C. (2007). Saving PTSD from itself in DSM-V. *Journal of Anxiety Disorders, 21*(2), 233-241. 10.1016/j.janxdis.2006.09.006

Spitzer, R. L., Rosen, G. M., & Lilienfeld, S. O. (2008). Revisiting the Institute of Medicine report on the validity of posttraumatic stress disorder. *Comprehensive Psychiatry, 49*(4), 319-320.

Spoont, M. R., Nelson, D. B., Murdoch, M., Rector, T., Sayer, N. A., Nugent, S., & Westermeyer, J. (2014). Impact of treatment beliefs and social network encouragement on initiation of care by VA service users with PTSD. *Psychiatric Services, 65*(5), 1.

Tanielian T, Jaycox LH, editors. (2008) Invisible wounds of war: Psychological and cognitive injuries, their consequences, and services to assist recovery. Santa Monica (CA): RAND.

Tanielian, T. (2009). Assessing combat exposure and post-traumatic stress disorder in troops and estimating the costs to society: Implications from the RAND Invisible Wounds of War Study (No. RAND-CT-321). RAND CORP SANTA MONICA CA.

Taylor, D. J., Lichstein, K. L., Durrence, H. H., Reidel, B. W., & Bush, A. J. (2005). Epidemiology of insomnia, depression, and anxiety. *Sleep, 28*(11), 1457-1464.

Trechak, A. A. (1999). On cultural and gender bias in medical diagnosis. *Multicultural Education, 7*(2), 41.

Tversky, A., & Kahneman, D. (1973). Availability: A heuristic for judging frequency and probability. *Cognitive Psychology, 5*(2), 207-232.

Tversky, A., & Kahneman, D. (1974). Judgment under uncertainty: Heuristics and biases. *Science (New York, N.Y.), 185*(4157), 1124-1131. 185/4157/1124 [pii]

Tversky, A. (1974). Assessing uncertainty. Journal of the Royal Statistical Society Series B (Methodological), 36(2), 148-159.

Van Ryn, M., & Burke, J. (2000). The effect of patient race and socio-economic status on physicians' perceptions of patients. *Social Science & Medicine, 50*(6), 813-828.

Veloski, J., Tai, S., Evans, A. S., & Nash, D. B. (2005). Clinical vignette-based surveys: A tool for assessing physician practice variation. *American Journal of Medical Quality, 20*(3), 151-157. 10.1177/1062860605274520

Vermetten, E., Baker, D. G., Jetly, R., & McFarlane, A. C. (2016). *Concerns over divergent approaches in the diagnostics of posttraumatic stress disorder*. Thorofare, N.J., etc. : Charles B Slack etc.10.3928/00485713-20160728-02

Wallander, L. (2011). Measuring social workers' judgements: Why and how to use the factorial survey approach in the study of professional judgements. *Journal of Social Work.* 1468017310387463.

Walsh, J. K. (2004). Clinical and socioeconomic correlates of insomnia. *The Journal of Clinical Psychiatry,*

Weathers, F.W., Blake, D.D., Schnurr, P.P., Kaloupek, D.G., Marx, B.P., & Keane, T.M. (2013). The clinician-administered PTSD scale for DSM-5 (CAPS-5). Interview available from the National Center for PTSD at www.ptsd.va.gov.

Weathers, F.W., Blake, D.D., Schnurr, P.P., Kaloupek, D.G., Marx, B.P., & Keane, T.M. (2013). The life events checklist for DSM-5 (LEC-5). Instrument available from the National Center for PTSD at www.ptsd.va.gov.

Widiger, T. A., & Spitzer, R. L. (1991). Sex bias in the diagnosis of personality disorders: Conceptual and methodological issues. *Clinical Psychology Review*, *11*(1), 1-22. 10.1016/0272-7358(91)90135-H

Wolkenstein, L., Bruchmüller, K., Schmid, P. & Meyer, T. (2011). Misdiagnosing bipolar disorder — Do clinicians show heuristic biases? Journal of Affective Disorders, 130, 405-412.

Woodward, H. E., Taft, C. T., Gordon, R. A., & Meis, L. A. (2009). Clinician bias in the diagnosis of posttraumatic stress disorder and borderline personality disorder. *Psychological Trauma: Theory, Research, Practice, and Policy, 1*(4), 282-290. 10.1037/a0017944

Yeager, D., Magruder, K. M., Knapp, R. G., Nicholas, J. S., & Frueh, B. C. (2007). Performance characteristics of the Posttraumatic Stress Disorder Checklist and SPAN in Veterans Affairs primary care settings. *General Hospital Psychiatry, 29*(4), 294-301.

Zajonc, R. B. (1968). Attitudinal effects of mere exposure. *Journal of Personality and Social Psychology, 9* (2p2), 1.

Appendix A

Vignette

A 32-year-old **[veteran or school teacher based on randomization]** presents for consultation at a mental health practice. They arrive 15 minutes late and they have not filled out paperwork that has been previously emailed to them. They appear slightly irritable when asked to fill out paperwork before seeing the therapist. During the diagnostic assessment the client reports they are presenting largely at their spouse's behest. When asked what the main concerns might be, they note routine difficulty falling asleep, routinely laying in bed for several hours before falling into a fitful and intermittent sleep. The client notes waking at every sound and then trouble falling back asleep. Overall, they report approximately 4-5 hours of sleep per night on average.

During the early part of the assessment the client's affect remains guarded and subdued and the interaction is notable for poor eye contact. When asked about further symptoms the client discloses they have been irritable. They gave an example: recently while making dinner, the client became frustrated by not being able to locate a commonly used cooking utensil. They noted they were unable to tolerate growing frustration and ultimately dumped over a kitchen drawer, causing everything to scatter. At this point the client reports their spouse came into the kitchen and the client said "They tried to calm me down, but that just made me angrier. I know they misplaced the spatula and even though I knew it was an over-reaction, I couldn't bring myself down. Things like this happen on occasion and it takes me forever to cool down."

Further into the assessment, the client reports frequent "overthinking." The client described ruminating on past events where they believe they have "messed up" in life and "let everyone down." They also described constant worry and a feeling of "waiting for the worst to happen." The client does not disclose what they believe the "worst" would be, and they remain guarded on this point. The issue of anxious and ruminative thoughts come up throughout the assessment. They client ultimately describes frustration that they can't "get myself to stop thinking about things sometimes."

Overall, they describe significant relational difficulties with their spouse who the client reports accuses them of being "checked out and always looking for a fight." By their own interpretation, they note they feel "detached." They indicate no current hobbies, no real desire to do things they previously enjoyed, and they find themselves avoiding public events and social gatherings, and making excuses to avoid "feeling overwhelmed" outside of work and home. Their affect remains subdued throughout the assessment. There is no notable psychomotor agitation, no identified health concerns, and they deny suicidal ideations.

Post-Vignette Questions

Question 1.
Based upon the vignette you have just read, please identify the primary diagnosis you would first consider for this client. Because you have been provided intentionally limited data, please extrapolate to the best of your ability, a single diagnosis from the list below you feel best reflects the client's presentation.

- Anxiety Disorder
- Bipolar I Disorder
- Bipolar II Disorder
- Borderline Personality Disorder
- Major Depressive Disorder
- Persistent Depressive Disorder (formerly Dysthymic Disorder)
- Posttraumatic Stress Disorder

Question 2.
Please select up to 3 diagnoses you would pursue in further assessment as possible rule-outs:

- Anxiety Disorder
- Bipolar I Disorder
- Bipolar II Disorder
- Borderline Personality Disorder
- Major Depressive Disorder
- Persistent Depressive Disorder (formerly Dysthymic Disorder)
- Posttraumatic Stress Disorder
- No rule-outs

Question 3.
Please select which diagnoses, if any, you feel are not supported by any information presented in the vignette, or "No selection". There is no limit to the number of diagnoses you may select.

- Anxiety Disorder
- Bipolar I Disorder
- Bipolar II Disorder
- Borderline Personality Disorder
- Major Depressive Disorder

- Persistent Depressive Disorder (formerly Dysthymic Disorder)
- Posttraumatic Stress Disorder
- No selection

Appendix B

Letter of Invitation
Clinical Vignette Research Survey

Dear Colleagues:

This email is intended to solicit participation in my dissertation study, a brief, anonymous online-survey with IRB approval (830104). The purpose of this study is to evaluate professional decision-making utilizing clinical vignettes. I am seeking clinical professionals at the masters and doctoral level to participate.

All participants will be entered into a sweepstakes to win one of 10 $50 Amazon gift cards.

You are eligible to participate in this study if you have received a graduate degree in a clinical mental health field and completed at least one full graduate course in diagnostic assessment. You may participate even if you have not yet obtained your clinical license. Fields of training are not excluded – that is, participants may be psychologists, social workers, psychiatric nurse practitioners, counselors, or psychiatrists. Time to participate is expected to take no more than 15 minutes. Participation is entirely anonymous and voluntary, and you may withdraw at any time.

Eligibility:

- I have completed a graduate program in a clinical (mental health) program: y/n
- I have taken at least one graduate course in diagnostic assessment of mental health disorders: y/n

If you have answered yes to the above questions and are willing to participate, please click on the following link:

[link omitted]

If you have any questions about this study, please contact the PI (Crystal Shelton at [email omitted]).

Appendix C

Informed Consent

You are invited to participate in a web-based online survey on vignettes as a clinical decision-making tool. This is a research project being conducted by Crystal Shelton [email omitted]. It should take approximately 15 minutes to complete. University of Pennsylvania IRB protocol number 830104.

PARTICIPATION
Qualified participants will have graduated from a professional, clinical mental health program, with a minimum of a master's degree. Acceptable degrees include counseling, psychology, social work, marriage and family therapy, psychiatric nursing, and psychiatry. Participants should have completed at least one full graduate course in diagnostic assessment of mental health disorders. This survey is open to clinically licensed professionals with provisional or full licenses, as well as graduates of clinical mental health programs who have not yet obtained their provisional license.

The survey should take approximately 10 minutes to complete. Your participation in this survey is voluntary. You may refuse to take part in the research or exit the survey at any time without penalty.

BENEFITS
All participants who complete the survey will be given the opportunity to enter a raffle for one of 10 $50 Amazon gift cards.

RISKS
There are no foreseeable risks involved in participating in this study other than those encountered in day-to-day life.

CONFIDENTIALITY
Your survey answers will be sent to a link at Qualtrics.com, where data will be stored in a password protected electronic format. In order to receive a gift-card, participants will be asked at the end of the survey to provide the email address this letter was distributed to. Email addresses are in no way linked to the survey responses and your data will be completely anonymous.

CONTACT
If you have any general questions about this research or wish to obtain a copy of the results, please contact the PI: [email omitted]. If you feel you have not been treated according to the descriptions in this form, or that your rights as a participant in research have not been honored during the course of this project, or you have any questions, concerns, or complaints that you wish to address to someone other than the investigator,

you may contact University of Pennsylvania Institutional Research Board (IRB): [email omitted].

Appendix D

Table D.1 Logistic Regression Analysis of the Odds of Being Assigned the Experimental Group

	Odds Ratio	*p*-value	95% C.I for OR Lower	Upper
Years in Practice	1.00	0.67	0.97	1.02
Constant	1.10	0.55		

Table D.2 Chi-Square Test of Independence of Experiment Versus Control Groups on Licensure Status

		Group Assignment Teacher	Veteran
Fully Licensed	Count	133	143
	Std Residual	-0.2	0.2
Provisionally or Unlicensed	Count	46	44
	Std Residual	0.3	-0.3
Chi-square (1, *N*=366) = 0.23, *p* = 0.63			

Table D.3 Chi-Square Test of Independence of Experiment Versus Control Groups on Version of DSM Training

		Group Assignment Teacher	Veteran
DSM-IV	Count	62	64
	Std Residual	0	0
DSM-5	Count	42	44
	Std Residual	0	0
DSM-IV and DSM-5	Count	67	61
	Std Residual	0.6	-0.5
Neither or DSM-III	Count	8	18
	Std Residual	-1.3	1.3
Chi-square(3, *N*=366) = 4.04, *p* = 0.26			

Table D.4 Chi-Square Test of Independence of Experiment Versus Control Groups on Field of Highest Degree

		Group Assignment	
		Teacher	Veteran
Social Work	Count	100	106
	Std Residual	-0.1	0.1
Psychology	Count	52	52
	Std Residual	0.2	0.2
Counseling	Count	19	19
	Std Residual	0.1	-0.1
Nursing	Count	4	6
	Std Residual	-0.4	0.4
Psychiatry	Count	4	4
	Std Residual	0.0	0.0
Chi-square(4, N=366) = 400, p = 0.98			

Table D.5 Chi-Square Test of Independence of Experiment Versus Control Groups on Education Level

		Group Assignment	
		Teacher	Veteran
Bachelors	Count	2	7
	Std Residual	-1.1	1.1
Masters	Count	122	133
	Std Residual	-0.2	0.2
Doctoral	Count	55	47
	Std Residual	0.7	-0.7
Chi-square(2, N=366) = 3.70, p = 0.16			

Table D.6 Chi-Square Test of Independence of Experiment Versus Control Groups on Theoretical Orientation

		Group Assignment	
		Teacher	Veteran
Cognitive-Behavioral	Count	81	84
	Std Residual	0.0	0.0
Eclectic	Count	23	35
	Std Residual	-1.0	1.0
Humanistic / Person Centered	Count	19	24
	Std Residual	-0.4	0.4
Psychodynamic	Count	14	15
	Std Residual	0.0	0.0
No primary orientation	Count	21	26
	Std Residual	-0.4	0.4
Other	Count	21	3
	Std Residual	2.7	-2.6
Chi-square(5, N=366) = 17.02, p = 0.004			

Table D.7 Chi-Square Test of Independence of Experiment Versus Control Groups on Primary Practice Setting

		Group Assignment	
		Teacher	Veteran
Individual or Group Private Practice	Count	46	41
	Std Residual	0.5	-0.5
Non-Gov Healthcare System, Inpatient or Outpatient	Count	35	28
	Std Residual	0.8	-0.7
City, County or State MH Services	Count	19	14
	Std Residual	0.7	-0.7
Federal Agency (VA, DoD, BIA, etc)	Count	26	33
	Std Residual	-0.5	0.5
Non-Profit Organization	Count	35	37
	Std Residual	0.0	0.0
School (through 12th grade)	Count	4	9
	Std Residual	-0.9	0.9
College or University Counseling Center	Count	2	7
	Std Residual	-1.1	1.1
Other	Count	12	18
	Std Residual	-0.7	0.7
Chi-square(7, N=366) = 8.44, p = 0.30			

Table D.8 Chi-Square Test of Independence of Experiment Versus Control Groups on Specialized Practice Experience with Populations

			Group Assignment	
			Teacher	Veteran
Child/Adolescents	No	Count	86	88
		Std Residual	0.1	-0.1
	Yes	Count	93	99
		Std Residual	-0.1	0.1
	Chi-square(1, *N*=366) = 0.04, *p* = 0.85			
College Students	No	Count	112	138
		Std Residual	-0.9	0.9
	Yes	Count	67	49
		Std Residual	1.4	-1.3
	Chi-square(1, *N*=366) = 0.53, *p* = 0.02			
Families/Couples	No	Count	95	113
		Std Residual	-0.7	0.7
	Yes	Count	84	74
		Std Residual	0.8	-0.7
	Chi-square(1, *N*=366) = 2.02, *p* = 0.16			
Gerontology	No	Count	146	154
		Std Residual	-0.1	0.1
	Yes	Count	33	33
		Std Residual	0.1	-0.1
	Chi-square(1, *N*=366) = 0.04, *p* = .84			
LGBTQ	No	Count	132	149
		Std Residual	-0.5	0.5
	Yes	Count	47	38
		Std Residual	0.8	-0.8
	Chi-square(1, *N*=366) = 1.81, *p* = 0.18			
Veterans/Military	No	Count	115	126
		Std Residual	-0.3	0.3
	Yes	Count	64	61
		Std Residual	0.4	-0.4
	Chi-square(1, *N*=366) = 0.40, *p* = 0.53			
Women	No	Count	85	109
		Std Residual	-1.0	1.0
	Yes	Count	94	78
		Std Residual	1.1	-1.1
	Chi-square(1, *N*=366) = 4.29, *p* = 0.04			
Other	No	Count	146	162
		Std Residual	-0.4	0.4
	Yes	Count	33	25

Std Residual	0.9	-0.9
Chi-square(1, *N*=366) = 1.76, *p* = 0.19		

Table D.9 Chi-Square Test of Independence of Experiment Versus Control Groups on Specialized Practice Experience with Disorders

			Group Assignment Teacher	Veteran
Affective Disorder	No	Count	83	96
		Std Residual	-0.5	0.5
	Yes	Count	96	91
		Std Residual	0.5	-0.5
		Chi-square(1, *N*=366) = 0.90, *p* = 0.34		
Compulsive and Addictive Behaviors	No	Count	126	136
		Std Residual	-0.2	0.2
	Yes	Count	53	51
		Std Residual	0.3	-0.3
		Chi-square(1, *N*=366) = 0.25, *p* = 0.62		
Eating Disorders	No	Count	160	173
		Std Residual	-0.2	0.2
	Yes	Count	19	14
		Std Residual	0.7	-0.7
		Chi-square(1, *N*=366) = 1.09, *p* = 0.30		
Health Psychology	No	Count	146	146
		Std Residual	0.3	-0.3
	Yes	Count	33	41
		Std Residual	-0.5	0.5
		Chi-square(1, *N*=366) = 0.69, *p* = 0.41		
Serious and Persistent Mental Illness	No	Count	86	89
		Std Residual	0.0	0.0
	Yes	Count	93	98
		Std Residual	0.0	0.0
		Chi-square(1, *N*=366) = 0.007, *p* = 0.93		
Personality Disorders	No	Count	101	113
		Std Residual	-0.4	0.4
	Yes	Count	78	74
		Std Residual	0.4	-0.4
		Chi-square(1, *N*=366) = 0.60, *p* = 0.44		
Substance Abuse	No	Count	104	110
		Std Residual	-0.9	0.8
	Yes	Count	75	77
		Std Residual	0.1	-0.1
		Chi-square(1, *N*=366) = 0.02, *p* = 0.89		
Trauma	No	Count	42	56
		Std Residual	-0.9	0.8
	Yes	Count	137	131
		Std Residual	0.5	-0.5

		Chi-square(1, *N*=366) = 1.96, *p* = 0.16		
Other	No	Count	159	167
		Std Residual	0.0	0.0
	Yes	Count	20	20
		Std Residual	0.1	-0.1
		Chi-square(1, *N*=366) = 0.02, *p* = .88		

Appendix E

Table E.1 Chi-Square Test of Independence of Experiment Versus Control Groups on Selecting PTSD as the Primary Diagnosis by Licensure Status

License Held	Diagnosis		Group Assignment Teacher	Veteran
Fully Licensed	Anxiety Disorder	Count	48	30
		Std Residual	1.7	-1.6
	Bipolor I Disorder	Count	2	0
		Std Residual	1.1	-1.0
	Bipolar II Disorder	Count	3	1
		Std Residual	0.8	-0.7
	Borderline Personality Disorder	Count	2	4
		Std Residual	-0.5	0.5
	Major Depressive Disorder	Count	51	29
		Std Residual	2.0	-1.9
	Persistent Depressive Disorder	Count	10	8
		Std Residual	0.5	-0.4
	PTSD	Count	17	71
		Std Residual	-3.9	3.8
	Chi-square(6, N=276) = 46.96, p = 0.00			
Unlicensed or Provisionally Licensed	Anxiety Disorder	Count	16	14
		Std Residual	0.2	-0.2
	Bipolor I Disorder	Count	1	0
		Std Residual	0.7	-0.7
	Bipolar II Disorder	Count	1	1
		Std Residual	0.0	0.0
	Borderline Personality Disorder	Count	2	0
		Std Residual	1.0	-1.0
	Major Depressive Disorder	Count	15	13
		Std Residual	0.2	-0.2
	Persistent Depressive Disorder	Count	6	3
		Std Residual	0.7	-0.7
	PTSD	Count	5	13
		Std Residual	-1.4	1.4
	Chi-square(6, N=90) = 7.8, p = 0.25			
Total Chi-square(6, N=366) = 49.73, p = 0.00				

Table E.2 Chi-Square Test of Independence of Experiment Versus Control Groups on Selecting PTSD as the Primary Diagnosis by DSM Training

Training	Diagnosis		Group Assignment Teacher	Veteran
DSM-IV	Anxiety Disorder	Count	26	13
		Std Residual	1.6	-1.5
	Bipolar II Disorder	Count	1	0
		Std Residual	0.7	-0.7
	Borderline Personality Disorder	Count	1	2
		Std Residual	-0.4	0.4
	Major Depressive Disorder	Count	23	16
		Std Residual	0.9	-0.9
	Persistent Depressive Disorder	Count	5	3
		Std Residual	0.5	-0.5
	PTSD	Count	6	30
		Std Residual	-2.8	2.7
	Chi-square(5, N=126) = 23.40, p = 0.00			
DSM-5	Anxiety Disorder	Count	16	11
		Std Residual	0.8	-0.8
	Bipolar II Disorder	Count	1	2
		Std Residual	-0.4	0.4
	Borderline Personality Disorder	Count	2	0
		Std Residual	1.0	-1.0
	Major Depressive Disorder	Count	14	13
		Std Residual	0.2	-0.2
	Persistent Depressive Disorder	Count	4	4
		Std Residual	0.0	0.0
	PTSD	Count	5	14
		Std Residual	-1.4	1.4
	Chi-square(5, N=86) = 7.52, p = 0.19			
Both DSM-IV and DSM-5	Anxiety Disorder	Count	19	15
		Std Residual	0.3	-0.3
	Biploar I Disorder	Count	3	0
		Std Residual	1.1	-1.2
	Bipolar II Disorder	Count	2	0
		Std Residual	0.9	-1.0
	Borderline Personality Disorder	Count	1	2
		Std Residual	-0.5	0.5
	Major Depressive Disorder	Count	26	11
		Std Residual	1.5	-1.6
	Persistent Depressive Disorder	Count	6	4
		Std Residual	0.3	-0.4
	PTSD	Count	10	29
		Std Residual	-2.3	2.4
	Chi-square(6, N=128) = 21.31, p = 0.002			
Neither or DSM-3	Anxiety Disorder	Count	3	5
		Std Residual	0.3	-0.2
	Major Depressive Disorder	Count	3	2
		Std Residual	1.2	-0.8
	Persistent Depressive Disorder	Count	1	0
		Std Residual	1.2	-0.8
	PTSD	Count	1	11
		Std Residual	-1.4	0.9

			Chi-square(3, *N*=26) = 7.26, *p* = 0.064	
			Total Chi-square(6, *N*=366) = 49.74, *p* = 0.00	

Table E.3 Chi-Square Test of Independence of Experiment Versus Control Groups on Selecting PTSD as the Primary Diagnosis by Field of Highest Degree Earned

			Group Assignment	
Field	Diagnosis		Teacher	Veteran
Social Work	Anxiety Disorder	Count	37	25
		Std Residual	1.3	-1.2
	Bipolar I Disorder	Count	2	0
		Std Residual	1.0	-1.0
	Bipolar II Disorder	Count	4	1
		Std Residual	1.0	-1.0
	Borderline Personality Disorder	Count	3	1
		Std Residual	0.8	-0.7
	Major Depressive Disorder	Count	33	23
		Std Residual	1.1	-1.1
	Persistent Depressive Disorder	Count	11	7
		Std Residual	0.8	-0.7
	PTSD	Count	10	49
		Std Residual	-3.5	3.4
	Chi-square(6, *N*=206) = 35.43, *p* = 0.00			
Psychology	Anxiety Disorder	Count	15	13
		Std Residual	0.3	-0.3
	Bipolar I Disorder	Count	1	0
		Std Residual	0.7	-0.7
	Borderline Personality Disorder	Count	1	2
		Std Residual	-0.4	0.4
	Major Depressive Disorder	Count	24	9
		Std Residual	1.8	-1.8
	Persistent Depressive Disorder	Count	3	2
		Std Residual	0.3	-0.3
	PTSD	Count	8	26
		Std Residual	-2.2	2.2
	Chi-square(5, *N*=104) = 18.0, *p* = 0.003			
Counseling	Anxiety Disorder	Count	10	4
		Std Residual	1.1	-1.1
	Borderline Personality Disorder	Count	0	1
		Std Residual	-0.7	0.7
	Major Depressive Disorder	Count	5	8
		Std Residual	-0.6	0.6
	Persistent Depressive Disorder	Count	2	2
		Std Residual	0.0	0.0
	PTSD	Count	2	4
		Std Residual	-0.6	0.6
	Chi-square(4, *N*=38) = 4.93, *p* = 0.23			
Nursing	Anxiety Disorder	Count	1	1
		Std Residual	0.2	-0.2
	Bipolar II Disorder	Count	0	1
		Std Residual	-0.6	0.5
	Major Depressive Disorder	Count	3	1
		Std Residual	1.1	-0.9
	PTSD	Count	0	3
		Std Residual	-1.1	0.9
	Chi-square(3, *N*=10) = 4.8, *p* = 0.19			
Psychiatry	Anxiety Disorder	Count	1	1
		Std Residual	0.0	0.0
	Major Depressive Disorder	Count	1	1
		Std Residual	0.0	0.0
	PTSD	Count	2	2

	Std Residual	0.0	0.0
Chi-square(3, *N*=8) all cells have less than minimum expected count			
Total Chi-square(6, *N*=366) = 49.73, *p* = 0.00			

Table E.4 Chi-Square Test of Independence of Experiment Versus Control Groups on Selecting PTSD as the Primary Diagnosis by Highest Educational Degree Earned

Education Level	Diagnosis		Group Assignment Teacher	Veteran
Bachelors	Anxiety Disorder	Count	1	4
		Std Residual	-0.1	0.1
	PTSD	Count	1	3
		Std Residual	0.1	-0.1
	Chi-square(1, *N*=9) = 0.32, *p* = 0.86			
Masters	Anxiety Disorder	Count	48	30
		Std Residual	1.7	-1.7
	Bipolor I Disorder	Count	2	0
		Std Residual	1.1	-1.0
	Bipolar II Disorder	Count	4	1
		Std Residual	1.0	-1.0
	Borderline Personality Disorder	Count	3	2
		Std Residual	0.4	-0.4
	Major Depressive Disorder	Count	42	34
		Std Residual	0.9	-0.9
	Persistent Depressive Disorder	Count	12	9
		Std Residual	0.6	-0.6
	PTSD	Count	11	57
		Std Residual	-3.8	3.6
	Chi-square(6, *N*=255) = 40.14, *p* = 0.00			
Doctoral	Anxiety Disorder	Count	15	10
		Std Residual	0.4	-0.4
	Bipolor I Disorder	Count	1	0
		Std Residual	0.6	-0.7
	Bipolar II Disorder	Count	0	1
		Std Residual	-0.7	0.8
	Borderline Personality Disorder	Count	1	2
		Std Residual	-0.5	0.5
	Major Depressive Disorder	Count	24	8
		Std Residual	1.6	-1.8
	Persistent Depressive Disorder	Count	4	2
		Std Residual	0.4	-0.5

	PTSD	Count	10	24
		Std Residual	-1.9	2.1
Chi-square(6, *N*=102) = 17.24, *p* = 0.008				
Total Chi-square(6, *N*=366) = 49.73, *p* = 0.00				

Table E.5 Chi-Square Test of Independence of Experiment Versus Control Groups on Selecting PTSD as the Primary Diagnosis by Theoretical Orientation

Theoretical Orientation	Diagnosis		Group Assignment Teacher	Veteran
Cognitive-Behavioral	Anxiety Disorder	Count	30	17
		Std Residual	1.4	-1.4
	Bipolar I Disorder	Count	1	0
		Std Residual	0.7	-0.7
	Bipolar II Disorder	Count	2	0
		Std Residual	1.0	-1.0
	Borderline Personality Disorder	Count	2	2
		Std Residual	0.0	0.0
	Major Depressive Disorder	Count	32	18
		Std Residual	1.5	-1.5
	Persistent Depressive Disorder	Count	6	4
		Std Residual	0.5	-0.5
	PTSD	Count	8	43
		Std Residual	-3.4	3.3
Chi-square(6, *N*=165) = 34.89, *p* = 0.00				
Eclectic	Anxiety Disorder	Count	8	7
		Std Residual	0.8	-0.7
	Borderline Personality Disorder	Count	0	2
		Std Residual	-0.9	0.7
	Major Depressive Disorder	Count	11	6
		Std Residual	1.6	-1.3
	Persistent Depressive Disorder	Count	2	1
		Std Residual	0.7	-0.6
	PTSD	Count	2	19
		Std Residual	-2.2	1.8
Chi-square(4, *N*=58) = 15.83, *p* = 0.003				
Humanistic / Person Centered	Anxiety Disorder	Count	6	9
		Std Residual	1.1	-1.1
	Bipolar II Disorder	Count	0	1
		Std Residual	-0.7	0.6
	Borderline Personality Disorder	Count	1	0
		Std Residual	0.8	-0.7
	Major Depressive Disorder	Count	6	4
		Std Residual	0.8	-0.7
	Persistent Depressive Disorder	Count	2	2
		Std Residual	0.2	-0.2
	PTSD	Count	4	8
		Std Residual	-0.6	0.5
Chi-square(5, *N*=43) = 3.8, *p* = 0.58				
Psychodynamic	Anxiety Disorder	Count	6	5
		Std Residual	0.3	-0.3
	Bipolar I Disorder	Count	1	0
		Std Residual	0.7	-0.7
	Major Depressive Disorder	Count	5	4
		Std Residual	0.3	-0.3
	PTSD	Count	2	6
		Std Residual	-0.9	0.9
Chi-square(3, *N*=29) = 3.17, *p* = 0.37				
No Primary Orientation	Anxiety Disorder	Count	7	6
		Std Residual	0.5	-0.4
	Bipolar I Disorder	Count	1	0
		Std Residual	0.8	-0.7
	Bipolar II Disorder	Count	0	1
		Std Residual	-0.7	0.6
	Borderline Personality Disorder	Count	1	0
		Std Residual	0.8	-0.7
	Major Depressive	Count	1	1

	Disorder	Std Residual	0.0	0.0
	Persistent Depressive Disorder	Count	4	3
		Std Residual	0.5	-0.4
	PTSD	Count	2	6
		Std Residual	-0.8	0.7
	Chi-square(6, N=47) = 6.95, p = 0.33			
Total Chi-square(6, N=366) = 49.73, p = 0.00				