



Cleveland State University
EngagedScholarship@CSU


ETD Archive

Summer 7-14-2022

The Detection Of Malingered Post-Traumatic Stress Disorder With The Cap-Q And Traumatic Events Inventory

Samuel D. Rodman

Follow this and additional works at: <https://engagedscholarship.csuohio.edu/etdarchive>

 Part of the [Psychology Commons](#)

How does access to this work benefit you? Let us know!

THE DETECTION OF MALINGERED POST-TRAUMATIC STRESS DISORDER
WITH THE CAP-Q AND TRAUMATIC EVENTS INVENTORY

SAMUEL DAVID RODMAN

Bachelor of Arts in Writing

University of Mount Union

May 2018

submitted in partial fulfillment of requirements for the degree

MASTER OF ARTS IN PSYCHOLOGY

at the

CLEVELAND STATE UNIVERSITY

AUGUST 2022

We hereby approve this thesis for

SAMUEL D. RODMAN

Candidate for the Master of Arts in Psychology degree for the

Department of Psychology

and the CLEVELAND STATE UNIVERSITY'S

College of Graduate Studies by

Thesis Chairperson, Amir Poreh, PhD

Department & Date

Methodologist, Kathleen Reardon, PhD

Department & Date

Thesis Committee Member, Colleen M McMahon, PhD

Department & Date

Student's Date of Defense: July 14, 2022

THE DETECTION OF MALINGERED POST-TRAUMATIC STRESS DISORDER
WITH THE CAP-Q AND TRAUMATIC EVENTS INVENTORY

SAMUEL RODMAN

ABSTRACT

The feigning of psychiatric symptoms is of great concern in both clinical and forensic settings. Therefore, it is crucial to develop reliable and valid measures that are not only diagnostically valid but also allow for the detection of individuals who are attempting to exaggerate illness in order to receive monetary compensation or escape duty or work. The present study was initiated so as to assess the psychometric properties of a new measure for the assessment of Post-Traumatic Stress Disorder (PTSD), the A-PTSD Scale. This 35-item self-report measure relies on the DSM-V criteria and employs indirect questioning as well as reversed items to provide more security against the feigning of symptoms. The A-PTSD scale utilizes two subscales: the primary PTSD scale which provides a total score, and a resiliency scale. The resiliency scale is intended to work as both a prognostic measure and a validity scale. Namely, there is ample research showing that individuals with such traits can successfully recover from adverse experiences. As such, they are less likely to suffer from long-term chronic PTSD symptoms. Given that stand-alone PTSD measures are impacted by confirmatory bias the A-PTSD scale was intended to be embedded within the 148-item CAP-Q, a multiscale self-report measure that includes its own traditional validity scales. The results of the study show that A-PTSD psychometric properties are not impacted by being embedded within the CAP-Q. It also had comparable reliability with existing PTSD measures and was able to discriminate between PTSD simulators and non-simulators, correlated with

cognitive measures of effort. Overall, the A-PTSD appears to have incremental utility over traditional measures, although additional studies using clinical populations are recommended prior to adapting measure into clinical practice.

TABLE OF CONTENTS

	Page
ABSTRACT.....	iii
CHAPTER	
I. INTRODUCTION.....	1
1.1 History of PTSD.....	1
1.2 Current Conceptualization and Diagnosis of PTSD.....	2
1.3 Psychiatric Comorbidity and PTSD.....	6
1.4 Assessment of PTSD.....	7
1.4.1 Structured Diagnostic Interviews.....	7
1.4.2 Self-Report Measures.....	7
1.5 Malingered Post-Traumatic Stress Disorder.....	9
1.6 Summary and Conclusions.....	12
1.7 Hypotheses.....	13
II. METHOD.....	14
2.1 Participants.....	14
2.1.1 Groups.....	14
2.1.2 Embeddedness Within Group.....	15
2.2 Material.....	15
2.2.1 General Measures.....	15
2.2.2 Measures of Psychopathology.....	16
2.2.3 Measures of Response Bias.....	17
2.3 Procedure.....	19
2.4 Statistical software.....	20
III. RESULTS.....	22
3.1 Descriptive Statistics.....	22

3.2 Hypotheses	22
IV. DISCUSSION	25
4.1 Limitations	27
4.2 Future Directions	28
4.3 Strengths	28
REFERENCES	30
APPENDICES	
A: Tables	39
B: Figures	43
C: A-PTSD Scale	44

LIST OF TABLES

Table	Page
1. Age, gender, and education by group	39
2. Education level as predicted by group membership	39
3. Internal consistency of the eight groups on the self-report PTSD measures	39
4. Scores of the eight groups on the self-report PTSD measures	40
5. Effect of diagnosis on A-PTSD scores	40
6. Regression table analyzing the effect of embeddedness and age on CAP-Q scale scores	40
7. The effect of Simulated Responses on the CAP-Q validity scales	42

LIST OF FIGURES

Figure	Page
1. Ethnicity by group membership.....	43
2. T-scores on the CAP-Q scales by group membership.....	71

CHAPTER I

INTRODUCTION

1.1 History of PTSD

The initial conceptualization of Post-Traumatic Stress Disorder (PTSD) was first described by the Babylonians almost 4000 years ago (Crocq 2000). With the advent of modern warfare during World War I and following the carnage on the battlefields of Europe, the disorder received greater attention by the professionals of the general public. The number of psychiatric casualties during this war outnumbered the number of physical casualties impacting the military readiness of the various armies who were engaging in this conflict. It was during that time that the British High Command coined the term “Shell Shock” (Merskey, 1995; Brown, 1995).

PTSD has since been expanded from its initial conceptualization in war-time settings to the civilian population. Al-Saffar & Hallstrom (2002) and Solomon (1989), for example, report that PTSD patients in the civilian populace report poorer self-rated physical health compared to other populations. Additionally, they report fewer benefits from treatment at follow-up. PTSD has also been associated with poorer social functioning, particularly in combat veterans and women with a history of childhood abuse. Namely, both groups report impairments in psychosocial functioning (Cloitre et

al., 2005), feelings of alienation and permanent change as the result of the traumatic exposure as well as the absence of mental planning related to inferior outcomes in treatment (Ehlers et al., 1998). Disruptions in functioning may also be associated with insomnia and nightmares, anxiety, agitation as well as higher levels of daytime fatigue in comparison to control groups (Inman, Silver & Doghramji, 1990).

1.2 Current Conceptualization and Diagnosis of PTSD

The American Psychiatric Association provided the first formal criteria for the diagnosis and phenomenological description of PTSD (American Psychiatric Association, 1987). The initial formulation was outlined in the DSM-III-R edition and categorized the disorder within the general class of “anxiety” disorders category. Although a large portion of the research and understanding of PTSD was originally conceptualized in wartime settings, the DSM-III-R diagnosis applied to the general population in addition to veterans. Criterion A defined the disorder as resulting from an event that was outside of the usual human experience, and which involved a serious threat to the physical integrity of the individual. Examples of such events include natural disasters, or deliberate events such as rape, torture, military combat, and so on (North et al., 2016). Additionally, these events could qualify for this criterion if they had been witnessed as they occurred, or through learning about such an event happening to others. Property damage, such as to one's home or community, was also deemed qualifiable as a traumatic event. The criterion A event was expected to likely evoke feelings of “intense fear, terror, and helplessness” (American Psychological Association, 1987). The DSM-III-R outlined 3 categories of symptoms: re-experiencing, avoidance and numbing, and

hyperarousal. These symptoms needed to be present for at least one month to diagnose PTSD.

In the DSM-IV Criterion A (traumatic stressor) remained largely unchanged (American Psychological Association, 2000). Property damage was removed as it was not deemed as an experience warranting the diagnosis of the disorder. Additionally, the DSM-IV allowed for life-threatening illnesses to constitute as a traumatic experience. This revision is consistent with studies showing that cancer patients exhibit higher rates of PTSD than patients exposed to chronic illnesses (Amir & Ramati, 2002). The three symptom categories of re-experiencing, avoidance and numbing, and hyperarousal remained in the DSM-IV with minor changes.

In the most recent revision of the American Psychiatric Association classification system, the DSM-5, the diagnosis of PTSD was removed from the anxiety disorders category and was included in a new category termed "trauma and stress-related disorders." (American Psychological Association, 2000).

In sum, the diagnosis of PTSD in the DSM-5 is based on six primary criteria (American Psychiatric Association, 2013).

- Criterion A deals with the traumatic event that precipitated the disorder. Not every stressful event is sufficient to establish the onset of the disorder. Current thinking is that the traumatic event must be experienced firsthand either once or several times. These events may be either a direct risk to personal health and life or witnessed in person as such an event occurs to another. Additionally, learning about similar events happening to a close other or a family member was also established as sufficient to

cause the onset of PTSD. The diagnosis of PTSD cannot be made in absence of such an event occurring.

- Criterion B establishes re-experiencing as a necessary part of the disorder. Re-experiencing is the reliving of a traumatic event as if it were occurring again or having recurring memories about the event. Re-experiencing symptoms are intrusive and involuntary, meaning that they occur outside of the active will of the individual. Re-experiencing may occur through the modality of nightmares which contain contents related to the traumatic event. Cues for instances of re-experiencing can either occur through external stimuli that remind the individual consciously or unconsciously about the event, or through internal cues that do the same. When re-experiencing does occur, a marked physiological response may occur that resembles the individual's organismic response to the original traumatic event.
- Criterion C establishes the avoidance of traumatic cues as salient symptoms. Individuals with PTSD may actively avoid internal cues of the traumatic event or may actively avoid--either consciously or unconsciously--external cues of the traumatic event. Individuals with PTSD avoid these cues to avoid the unwilling resurgence of traumatic memories.
- Criterion D details the changes in cognition and affect that may result from the occurrence of a criterion A satisfying event. Symptoms of such changes may be a lack of memory for details of the traumatic event, or changes in belief that represent the world or the self as necessarily dangerous, or a changing view of the self that results in the individual blaming themselves for the traumatic event occurring. Changes in affect may result in a perpetually negative mood or the inability to

- experience positively valenced emotional states. Individuals may also avoid participation in activities and feel estrangement from others.
- Criterion E details the changes in an individual's physiology that may occur as the result of experiencing a traumatic event. Traumatic events may deeply change an individual's behavior by increasing their responsiveness and arousal in response to potential threat cues. This may manifest in aggressive behavior towards others expressed through either a chronic irritable mood state or through acute angry outbursts. Increased salience of potential threat stimuli and attention towards those stimuli manifests as hypervigilance--the constant act of scanning and guarding against potential threats. Increased reactivity to potential threat cues manifests as an exaggerated startle response. The increase in arousal post-traumatic event may cause notable troubles with sleep and concentration. PTSD may also manifest reckless and self-destructive behaviors.
 - Criterion F establishes the exclusionary factor that the symptoms of PTSD must have been present for one month at a minimum. Notably, PTSD may develop into a chronic disorder in roughly 30% of individuals diagnosed (Guevara, 2019).
 - Criterion G notes that the significance of the distress must cause impairments in social, occupational, and other areas of functioning.
 - Criterion H functions as an exclusionary criterion noting that the impairments and symptoms experienced must not be caused by substance use or by another medical condition.

1.3 Psychiatric Comorbidity and PTSD

While the diagnosis of PTSD is widely used in the practice of psychology, the disorder continues to be a subject of controversy due to high rates of comorbidity with other disorders. For example, higher global scores obtained on the Post-Traumatic Diagnostic Scale were associated with higher reports of the symptoms of anxiety and depression (Foa et al., 1997). PTSD also has a high rate of comorbidity with mood disorders, and subjects with the diagnosis exhibit a 77% prevalence rate in a sample taken by Brown et al. (2001). Lifetime comorbidity for PTSD subjects in the same sample was found to be 100%. Depression was found to be comorbid with PTSD at a rate of 65%. Substance use disorders (alcohol and other than alcohol) were also found to be comorbid with PTSD at a rate of 34% lifetime prevalence. Galatzer-Levy et al. (2013) found three classes of PTSD comorbidities using a latent class analysis. While no pure PTSD group was identified, the most commonly occurring group was low comorbidity (62.1% of the sample) with a 30% lifetime comorbidity rate for a major depressive episode. The second group in terms of frequency was the class of PTSD with comorbid depression and anxiety with low probabilities of substance dependence (23.7% of the sample). The final group was the class of PTSD with comorbid mood and anxiety disorders alongside substance dependence (14.1% of the sample). The latter two groups were associated with a heightened risk for suicidal ideation.

PTSD has also been found to have associations with OCD. A study by Fontenelle et al. (2012) found that 19% of their sample of OCD subjects had comorbid PTSD. The authors observed that symptom presentations for OCD developed after PTSD and consisted of delayed onset, a more severe clinical picture, and comorbidities with other mood and

somatoform disorders. Nacasch, Fostick, and Zohar (2011) have hypothesized that there may be an underdiagnosis of this comorbidity based on the similar symptom profiles of PTSD and OCD, and on a 41% rate of concurrent PTSD and OCD diagnoses in their sample.

1.4 Assessment of PTSD

Diagnostic assessments of PTSD come in two primary forms: structured diagnostic interviews and self-report measures.

1.4.1 Structured Diagnostic Interviews

The structured diagnostic interviews are face-to-face meetings during which the clinician asks a set number of predetermined questions, interprets the responses in terms of the diagnostic criteria, and scores said responses accordingly. Various forms of structured interviews could be used to diagnose PTSD, ranging from the popular CAPS-5 (45-60 minutes to administer) to the Mini-International Neuropsychiatric Interview (MINI) (only 15 minutes to administer). Each interview shares the common use of the DSM or ICD-10 as the diagnostic standard. While structured interviews have an advantage in providing more in-depth insight into an individual's symptoms, their usage in high-participant-count research under a limited time frame may not be ideal due to both monetary and time costs.

1.4.2 Self-Report Measures

Freestanding Self-report measures. These measures fill the gap in costs by providing information either supporting or refuting the diagnosis without the use of a personally involved clinician. The use of free-standing self-report measures is commonly seen in research for data collection. In self-report administration, the individual being

assessed is responsible for reading, interpreting, and assigning an answer to each item on the scale used. Self-report scales vary in length and diagnostic intents regarding PTSD. Some, like the PTSD Checklist for the DSM-5 (PCL-5) and the PTSD Symptom Scale Self-Report Version (PSS-SR), are face-valid administrations that measure symptoms in direct relation to the DSM-5. Other measures like the Short PTSD Rating Interview (SPRINT) or the Impact of Event Scale-R (IES-R) do not directly map onto the DSM-5 but instead provide a brief assessment indicative of whether further testing is needed in a clinical setting. These scales may also be used to track symptom changes in clinical and research settings.

Multiscale measures. Multiscale measures assess a wide range of emotional problems such as depression, anxiety, mood dysregulation, and psychotic-like thinking. However, most of them were not designed to assess for PTSD, although they have scales that were later developed using preexisting items. Many of those scales show lower than expected reliability and validity (Wetzel et al., 2003).

The Personality Assessment Inventory. The 322-item Personality Assessment Inventory (PAI, Morey, 2014) has 22-scales. These scales include validity indicators aimed at assessing the patient's response style. Patients with PTSD produce distinct symptom endorsements on this measure (McDevitt-Murphy et al., 2005; Mozley et al., 2005). However, further research shows that the PAI is unable to discriminate between PTSD and depression (McDevitt-Murphy et al., 2007).

MMPI-2. Much like the PAI, the MMPI-2 was also not designed to assess for PTSD. Keane, Malloy, and Fairbank (1984) developed a subscale for the assessment of the disorder. The items chosen for the scale were based on clinical judgment or empirical

keying approach. Later studies however showed that this scale was unable to discriminate between PTSD and depression (Herman et al., 1996; McDevitt-Murphy et al., 2007). Nevertheless, by combining subscales such as the Keane PTSD scale within multiscale personality disorders, which include validity scales that assess for response bias, clinicians are able to identify individuals who are feigning PTSD symptoms.

The CAPQ. The 123-item CAP-Q is a relatively new multiscale inventory (Poreh & Levin, 2019). As such, it was never examined with the context of the evaluation of PTSD symptoms. It assumed that the CAP-Q has the same advantages and limitations as the more traditional measures, but this has yet to be properly examined. Unlike existing lengthy personality inventories, which utilize a fixed set of questions, the CAPQ employs a semi-adaptive approach. Namely, the inventories' questions can be tailored to the referral question using a two-tier system. The first tier includes a core inventory. The second-tier addresses domains that historically required standalone measures. The clinician relies on the referral question to determine which second-tier scales to administer, if any. The supplemental scales utilize indirect questions and include within-scale social desirability and response bias indices, intended to assist the examiner in answering referral questions and providing relevant diagnostic data.

1.5 Malingered Post-Traumatic Stress Disorder

Since the diagnosis of psychiatric disorders was first proposed, clinicians have observed that some patients would feign symptoms to obtain monetary compensation. Emil Kraepelin was the first to report such cases. In the 1920s, patients were documented to have reported brain damage (concussion) or emotional reaction to traumatic events (fear) so as to receive monetary compensation (Crocq, 2000). Kraepelin noted that “the

fact that all kinds of more or less severe psychiatric symptoms could lead to a lengthy stay in a hospital, or even to a discharge from the military with a generous disability pension, had disastrous consequences” (Kraepelin, 1994). In the following years, the verb “malingering” became more common, and “usually referred to a soldier or sailor pretending to be sick or insane in order to shirk duty. Later, psychologists began using malingering as a clinical term to describe the feigning of illness in avoidance of a duty or for personal gain” (Merriam-Webster, 2022). In the context of PTSD, malingering is defined as the attempt to gain external incentives through the production or exaggeration of a disorder’s symptoms (Ali, Jabeen, and Alam, 2015).

The complexity of feigning symptoms was further confounded by the emergence of cases whereby subjects exhibited behaviors aimed at getting the attention of the general public and receiving alms (Crocq, 2000). Hall and Hall (2007) have outlined that the prevalence of malingering appears to be variable with psychometric testing indicating prevalence rates of 20-30% in personal injury contexts. Research shows that the structured clinical interview for PTSD symptoms (Clinician Administered PTSD Scale for the DSM-5, CAPS-5; Weathers et al., 2013) maintains a low sensitivity. As such, the authors of the scale recommend augmenting the administration of this measure with measures of response bias to reduce the misuse of the healthcare system.

To counteract the effects of malingerers on clinical work and research, the DSM-4 guidelines urge clinicians to rule out malingering specifically in cases where the client stands to gain compensation through the diagnosis and its implications (American Psychological Association, 2000). Rosen (2006) reports that the guidelines have not been followed. Therefore, the failure to verify these participants for malingering may lead to

the allowance of contaminated data into the research literature (Rosen, 2004). The DSM-5 guidelines remain largely unchanged, although malingering was removed as a clinical diagnosis (Scott, 2015).

Key categories identified for detecting malingered symptoms are “amplified presentations” and “unlikely presentations” (Walczyk et al., 2018). Amplified presentations refer to the exaggeration of general psychopathology and the severity of symptoms reported. Unlikely presentations refer to symptom constellations that are uncommon/rare in genuine cases of psychopathology.

Patients who malingering psychiatric symptoms are often unaware of the type of cognitive deficits genuine patients experience. As such, they often exhibit various cognitive impairments such as memory deficits (Jabeen et al., 2015; Demakis and Elhai, 2011). Malingered cognitive impairments are another key target for measures of malingering. The key categories of identifying malingering in this are “excessive impairment,” and “unexpected patterns” (Walczyk et al., 2018). Excessive impairment deals with the significant underperforming on measures due to malingers overestimating how difficult the task would be for someone with psychopathology or impairment. For example, the forced-choice Portland Digit Recognition Test (Eldridge, 1992) and the TOMM (Tombaugh, 1997) are response-bias measures in which there is a 50% chance of selecting the right answer on a low-difficulty task. Individuals who score significantly below chance levels may be identified as malingered psychiatric disorders (Morel, 1998). In a practical application of response bias measures, Merten et al. (2009) reports that 51% of the German litigants he examined failed the word memory tests (WMT, Green, 2003), 23% failed the Reliable Digit Span index (RDS, Greiffenstein et al., 1994),

51% failed the structured inventory of malingered symptoms. Given the high rate of non-genuine responders, it appears that much like the assessment of brain injury, clinicians should employ measures of response bias when assessing for PTSD.

Additional validity indices have been included in common multiscale measures of personality such as the Minnesota Multiphasic Personality Inventory II (Graham, 1993) and the Personality Assessment Inventory (Morey, 2004). Some of the common validity indices include measures that are sensitive to exaggeration, such as the MMPI-2 F scale (a scale composed of items that are rarely endorsed), and other measures of response inconsistency. Namely, indices that assess how consistent the subject is while completing lengthy questionnaires (Hall & Hall, 2006).

Even with these tools to detect malingering available, clinicians are often reluctant to apply the label of “malingerer.” As such, there is a growing need to develop and administer measures that would enhance the competence of making such decisions.

1.6 Summary and Conclusions

This study was aims to assess the psychometric properties of a new scale title the “A-PTSD” (Poreh 2021). To this end, the concurrent validity of the new measure was assessed by correlating it with an existing self-report measure of PTSD. Given that the A-PTSD was designed to be interspersed within the CAP-Q, a question was raised as to what effect this interspersed would have on the CAP-Q’s clinical and validity scales. In fact, there has not been any previous studies examining how the interspersed of a scale may impact a multiscale measure’s results. Finally, given that PTSD assessment could be impacted by malingering, the impact of response bias was also assessed. Several hypotheses were presented:

1.7 Hypotheses

- 1) The A-PTSD scale will possess a similar level of reliability (internal consistency) as existing self-report measures of PTSD.
- 2) The A-PTSD scale will correlate highly with the PCL-5 supporting the concurrent validity of the new measure.
- 3) The A-PTSD scale will be able to distinguish between volunteers who had been diagnosed with PTSD by their psychiatrist or nurse practitioner and volunteers with the self-report diagnosis of depression and anxiety.
- 4) Interspersing the A-PTSD scale within the multiscale measure will not significantly impact the scores produced by the various scales or composites of the CAP-Q.
- 5) The resiliency subscale of the A-PTSD will correlate highly with subtle measures of response bias.
- 6) The CAP-Q validity scales will correlate highly with commonly used cognitive measures of feigning.
- 7) The CAP-Q validity scales will be able to discriminate between subjects who were asked to feign PTSD symptoms and the other diagnostic groups.
- 8) The Traumatic Events Inventory will correlate highly with commonly used cognitive measures of feigning.

CHAPTER II

METHODS

2.1 Participants

469 community-dwelling adults (≥ 18) were recruited as volunteers on ResearchMatch.org. The final sample size consisted of 278 participants, as 41% of the participants did not complete the survey. Participants were provided with an entry into a random drawing for five \$5 Amazon gift cards as compensation for completing the study. The study was approved by the university institutional review board prior to the data collection. Exclusionary criteria consisted of participants with no mental health history who scored 1.5 standard deviations above the mean on any diagnostic measures, and of any participants who did not show careful responding by having taken less than 5 minutes to complete the survey.

2.1.1 Groups

PTSD group. This group consisted of 105 participants who reported being diagnosed with Post-Traumatic Stress Disorder (PTSD) by their mental health professional. To validate the diagnosis, participants were administered the Life Events Checklist (LEC, Gray, Litz, Hsu, & Lombardo, 2004). This measure has been shown in

the literature to be reliable and valid in assessing the degree of traumatic experience in this population. Those reporting the experience of at least one potentially traumatic event were sorted into the PTSD group (Gray et al., 2004).

Anxiety and depression group. This group consisted of 70 participants who reported being diagnosed with anxiety/depression.

Simulation group. This group consisted of 95 volunteers without a mental health history. Subjects were presented with a short two-minute movie about PTSD and a vignette. The vignette instructs the participant to answer the rest of the survey as if they had PTSD. The movie and vignette served to guide them in their effort to feign the symptoms of the disorder.

Control Group. This group consisted of 44 participants who did not report being diagnosed with any mental disorders.

2.1.2 Embeddedness Within Group

To analyze the effect of embedding the A-PTSD within the CAP-Q, participants in each of the groups listed above were divided roughly in half between embedded and non-embedded subgroups. Participants in the embedded subgroups complete a version of the CAP-Q that included the A-PTSD. Participants in the non-embedded subgroups complete first the CAP-Q, and then the A-PTSD.

2.2 Material

2.2.1 General Measures

Demographic Questionnaire. Demographic information relevant to basic factors and past mental-health and medical diagnoses were gathered for each group. Demographic information also included current prescriptions of psychotropic

medications and the prescribing entity. Supplementary demographic information for each group was gathered and consisted of the number of traumatic events experienced including the approximate date of the experience (ages 0-4, 5-10, 11-16, 17-20, and 20+).

Life Events Checklist (LEC, Gray, Litz, Hsu, & Lombardo, 2004). The LEC is a self-report measure of past traumas experiences. The measure inquires about 17 potentially traumatic experiences and is commonly distributed with the CAPS in clinical settings. According to the publisher, the test-retest correlation is .82, with a full-scale kappa of .61.

2.2.2 Measures of Psychopathology

Cleveland Adaptive Personality Questionnaire (CAP-Q, Poreh & Levin, 2019).

As previously noted, the CAP-Q consists of 123 items. It consists of 11 clinical scales consistent with the DSM-5, and four (Consistency, Naivete, Infrequency, Defensiveness) validity scales. According to Poreh and Levin (2019), the psychometric properties of the subscales are as follows; Somatization (Clinical $\alpha = .83$, Non-clinical $\alpha = .82$), Depressive Mood (Clinical $\alpha = .89$, Non-clinical $\alpha = .87$), Avoidant (Clinical $\alpha = .87$, Non-clinical $\alpha = .87$), Sociopathy (Clinical $\alpha = .70$, Non-clinical $\alpha = .69$), Paranoia (Clinical $\alpha = .87$, Non-clinical $\alpha = .87$), Psychoticism (Clinical $\alpha = .80$, Non-clinical $\alpha = .78$), Borderline (Clinical $\alpha = .86$, Non-clinical $\alpha = .87$), Anakastia (Clinical $\alpha = .72$, Non-clinical $\alpha = .69$), Anxiety (Clinical $\alpha = .88$, Non-clinical $\alpha = .87$), Bipolar (Clinical $\alpha = .83$, Non-clinical $\alpha = .80$), and the Alcohol and Illicit Drug Use (Clinical $\alpha = .87$, Non-clinical $\alpha = .88$).

PTSD Checklist for the DSM-5 (PCL-5, Blevins et al., 2015). The PCL-5 is a self-report measure assessing for PTSD symptoms experienced within the past month.

The measure utilizes Likert scale responses ranging from 0-4 (0 = Not at all bothered by the symptom, 4 = Extremely bothered by the symptom). The PCL-5 has been found to have strong internal consistency ($\alpha = .94$) and test-retest reliability ($r = .82$), and represents a clinically useful update from the previous version of the measure.

The Adaptive PTSD (A-PTSD, Poreh 2021). The A-PTSD scale consists of 35 Likert-scale items corresponding to the 8 DSM-5 PTSD criteria. Unlike most existing self-standing measures, the A-PTSD emphasizes indirect and reversed questioning to assist in the protection of multiscale measures' validity indices. The scale included 10 items assessing for intrusion symptoms, 5 items evaluating avoidance, 7 items for negative alterations in cognitions and mood, 6 items addressing alterations in arousal and reactivity, and 7 items assessing resiliency. The resiliency subscale was added to understand the effects of protective factors on the severity of PTSD symptoms observed (Hjemdal et al., 2011).

2.2.3 Measures of Response Bias

Traumatic Event Inventory (TEI, Poreh, 2004). A shortened version of the TEI containing 30 dichotomous questions was utilized to assess for malingering. The TEI is organized into three superordinate categories: the first is associated distress with everyday situations before and after a traumatic event, the second is symptoms of distress before and after a traumatic event, and the third is the ability to function in everyday tasks before and after a traumatic event. Items are rated on a 1-4 scale to indicate the level of distress/anxiety/dysfunction (1 = None, 2 = Mild, 3 = Moderate, 4 = Severe).

Reliable Digit Span (RDS, Weschler, 1955). Both the digit span forward and digit span backward were administered. The measure was adapted for online

administration using a pre-recorded voice file to read the numbers aloud. The participants were then instructed to type out the numbers they remembered hearing into a textbox on the following screen. The “logic” function of Qualtrics was used to ensure that the participants could only listen to each file once. Research on PTSD’s impact on attention has yielded mixed results with the Weschler Memory Scales, indicating that these scales may not be structured with the precision to detect the attentional deficits associated with PTSD (Danckwerts & Leathem, 2003). The RDS, however, has been validated as a screening tool for malingering (Greiffenstein et al., 1994) in a study using 106 participants with traumatic brain injury, post-concussive syndrome, and probable malingerers. Notably, research by Burriss et al. (2008) has found no difference between combat veterans with PTSD and control groups on the digit span.

Portland Digit Recognition Test - Short Version (PDRT, Eldridge, 1992). The PDRT administers 72 items of digit recognition categorized into easy and hard time delays. For the easy category, 18 items are administered with a five-second delay before the participant's response, and 18 items are administered with a 15-second delay before the participant's response. For the hard category, 9 items are administered with a 30-second delay before the participant's response. This study will utilize a modified version of the PDRT, which administers 18 easy items and 18 hard items. To accommodate for the online format, delays are enforced using the ‘Logic’ function on Qualtrics.

Participants are asked to indicate which of two numbers that they remember having heard in a standard multiple-choice format. Though there is no current normative data for the internal reliability of the PDRT short form, a study by (Doane et al., 2005) found that the short form test only misclassified three cases (99.5% correctly classified) in a sample of

200 participants with potential traumatic brain injury or chronic pain who received psychological assessment for an attorney referral.

2.3 Procedure

Participants in the study consented to participate both during their initial recruitment on ResearchMatch.org and again upon their accessing of the Qualtrics.com survey. Participants were sorted by their self-reported diagnoses into four groups: 1) PTSD group, 2) depression/anxiety group, 3) control-effortful group, and 4) control-simulated response group, and then into either the embedded or non-embedded subgroup. Each group completed a range of basic demographic information and participants who self-reported a mental disorder completed additional sections related to the disorder. Each group additionally completed the LEC in addition to a supplementary trauma demographics questionnaire. A brief questionnaire covering common medical disorders followed for each group. The control-simulated response group then was informed of the common symptoms of PTSD through a publicly available YouTube video and was provided with instructions to malingering according to a provided vignette (Sakalli, 2016; Guriel, 2004). Control-simulated response participants were required to complete a short quiz to demonstrate their understanding of the disorder and their comprehension of the instructions for how to complete the rest of the study. Reminders to malingering were provided for this group prior to each following test. Half of each group then completed the CAPQ with the A-PTSD scale embedded, and the other half of each group completed the CAPQ with the A-PTSD scale immediately following. Each group then completed the PCL-5, the TEI, the RDS, and finished with the PDRT. Debriefing was provided for all participants.

2.4 Statistical software

All analyses were computed using SPSS v. 26. To assess the effects of demographic characteristics, Chi-square, and subsequent ANOVA analyses were performed. Since the data in the education variable took the form of count data (Poisson distribution), a Poisson analysis of variance was performed using the generalized linear model command. To test hypothesis one, a reliability analysis in the form of internal consistency was performed using the scale command. To test hypotheses two, three, four, and seven, the multivariate GLM command in SPSS v. 26 was utilized. Finally, to test hypotheses five, six, and eight, bivariate Spearman correlations were examined between measures of interest.

CHAPTER III

RESULTS

3.1 Descriptive Statistics

Table 1 shows the demographic composition of the four groups in this study. Chi square analysis shows that the three groups differed in relation gender (Chi square) and ethnicity (Chi square). Gender was not to have a significant effect on group membership ($\chi^2(21, N = 459) = 29.402, p = .105$), and ethnicity was additionally found not have a significant effect on group membership ($\chi^2(42, N = 459) = 41.299, p = .502$), see table 1 and figure 1. Follow up analysis of age (ANOVA) found that it had a significant effect on group membership, therefore all final analyses controlled for the effect of age ($F(7,485) = 10.366, p < .001$), see table 3. The results indicated that the level of education (ANOVA) did not have a significant effect on group membership ($F(1,7) = 3.509, p = .834$), see table 2.

3.2 Hypotheses

Hypothesis 1

The internal consistency of A-PTSD and PCL-5 were assessed using reliability analysis to compare respective psychometric properties. The PCL-5 demonstrated good internal

consistency in each group (Cronbach's alphas = .917 - .971). The A-PTSD evidenced comparable reliability as well for each group (Cronbach's alphas = .834 - .937), see table 3 and 4. A follow MANOVA without correcting for type I error showed that the embedded and nonembedded manipulation produced the same normative scores. Results indicated that embeddedness did not have a significant effect on PCL-5 and APTSD scores ($F(2, 338) = .514, p = .598$) independent of the effect of age ($F(2, 338) = 2.595, p = .076$).

Hypothesis 2

In testing hypothesis two, a multiple regression assessed the relationship between the PCL-5 and the A-PTSD Primary scale and the A-PTSD Resiliency scale. Results indicated that the A-PTSD Primary scale ($b = .968, p < .001$) and A-PTSD Resiliency scale ($b = -.661, p < .001$) were both significant predictors scores on the PCL-5.

Hypothesis 3

To test hypothesis three, ordinary least squares regression tested the effects of categorical diagnosis of either PTSD (diagnosed by nurse practitioner or psychiatrist) or anxiety/depression (without PTSD) on A-PTSD scores. Results demonstrated that there was a significant difference in the scores between these two groups ($b = -14.37, p < .001$), independent of the effects of age, see table 5.

Hypothesis 4

In testing hypothesis four, a multivariate general linear model was fit to examine the effects of embeddedness on the scales of the CAP-Q, while controlling for the effects of age. In all scales, embeddedness did not have a significant effect: Paranoia scale ($b = -.291, p = .736$), Psychoticism scale ($b = .025, p = .979$), Borderline scale ($b = .203, p =$

.827), Sociopathy scale ($b = .239, p = .794$), Avoidance scale ($b = -.208, p = .780$), OCPD scale ($b = -.270, p = .624$), Anxiety scale ($b = .337, p = .694$), Depression scale ($b = 1.039, p = .265$), Bipolar scale ($b = -.229, p = .775$), Somatic scale ($b = .850, p = .972$), Alcohol Use scale ($b = .672, p = .143$), Drug Use scale ($b = .444, p = .161$), Substance Abuse scale ($b = .929, p = .117$), Naivety scale ($b = .405, p = .275$), Infrequency scale ($b = .781, p = .553$), Defensiveness scale ($b = -.350, p = .508$), and the Consistency scale ($b = .400, p = .571$), see table 6. A breakdown of t-scores for each scale by group membership is provided, see figure 2.

Hypothesis 5

Analysis of the bivariate correlations (Spearman) between the A-PTSD resiliency scale and the CAP-Q validity scales indicated positive correlations with the naivety ($r(348) = .217, p < .001$) and defensiveness scales ($r(347) = .704, p < .001$), and negative correlations with the infrequency ($r(348) = -.616, p < .001$) and consistency scales ($r(348) = -.488, p < .001$).

Hypothesis 6

Results for hypothesis six were tested using bivariate correlational analyses (Spearman) to test the relationship between the CAP-Q validity scales and cognitive measure of feigning. Results indicated negative correlations between scores of the reliable digit span and the infrequency ($r(293) = -.437, p < .001$) and consistency scales ($r(293) = -.219, p < .001$), and a positive correlation with the defensiveness scale ($r(292) = .307, p < .001$). Naivety did not result in a significant correlation with the reliable digit span ($r(293) = .045, p = .444$). Results for the correlation between the Portland digit recognition test and the CAP-Q validity scales did not yield any significant correlations (Naivety: $r(249) =$

.068, $p = .282$, Infrequency: $r(249) = .009$, $p = .886$, Defensiveness: $r(249) = -.029$, $p = .648$, Consistency: $r(249) = .094$, $p = .136$).

Hypothesis 7

In testing hypothesis seven, a multivariate general linear model was fit to examine the categorical effects of PTSD malingering versus other diagnostic categories on each validity scale of the CAP-Q. The omnibus test indicated that PTSD malingering had a significant effect on the scores ($F(4, 265) = 46.301$, $p < .001$) independent of the effects of age. Results suggested significant effects on the infrequency ($b = -18.86$, $p < .001$), defensiveness ($b = 5.06$, $p < .001$), and consistency scales ($b = -6.09$, $p < .001$). However, results did not suggest a significant effect for the naivety scale ($b = .59$, $p = .274$), see table 7.

Hypothesis 8

In analyzing the bivariate correlations (Spearman) between the traumatic event inventory and the reliable digit span and Portland digit recognition test, negative correlations were found with both the reliable digit span ($r(266) = -.334$, $p < .001$) and the Portland digit recognition test ($r(228) = -.117$, $p = .076$), although only the former was significant.

CHAPTER IV

DISCUSSION

This is the first study to examine the psychometric properties and concurrent validity of the A-PTSD. This study utilized the PCL-5 as the comparison measure, given that it is a commonly used measure for assessing the construct Post-Traumatic Symptoms. In researching hypothesis one, the A-PTSD and PCL-5 were found to have comparably excellent internal consistency. As such, the two measures can be used interchangeably for the assessment of PTSD. As predicted in the second hypothesis, the two measures were highly intercorrelated. Namely, they demonstrate concurrent validity. In researching the discriminant validity of the A-PTSD, the measure was found to be able to distinguish between participants who had been diagnosed with PTSD and those who had been diagnosed with depression/anxiety. This finding supports that the A-PTSD evidences construct validity, although further research is needed to confirm this.

As was previously mentioned, the A-PTSD scale was designed to be embedded in the CAP-Q so as to reduce the tendency of subjects to over-endorse symptoms, as is often the case with a free-standing questionnaire. This methodology has never been implemented and therefore necessitated a careful evaluation. Namely, will the embedded methodology have an impact on the psychometrics of the embedded

test or the measures? The analysis of hypothesis four supports that embedding the A-PTSD scale did not significantly affect the scores on the CAP-Q in that the norms produced under the embedded and non-embedded conditions remained relatively unchanged.

One important difference between the A-PTSD and the PCL-5 is the A-PTSD's emphasis on indirect questioning and the inclusion of a scale for the assessment of the test-taking approach, namely, the addition of a scale for the assessment of resiliency. This scale was added with the assumption that those who develop severe PTSD symptoms would not score high on this measure. As such, subjects who score high on the resiliency scale could be trying to look good and endorse less severe PTSD symptoms. The results of hypothesis five confirms that this scale correlated positively with the CAP-Q's naivety and defensiveness scales. It also negatively correlated with the infrequency consistency scales. As such, the resiliency scale might serve as a measure of response bias, although additional research is needed to support this conclusion.

A question was raised as to whether the CAP-Q's validity scales could be used to identify subjects who are feigning PTSD symptoms. To this end, we correlated the CAP-Q validity scales with state-of-the-art symptom validity measures (the RDS and the PDRT). The results of hypothesis six show that the Infrequency, Defensiveness, and Consistency scales correlated with the RDS, and that the Naivety scale did not. Surprisingly, none of the CAP-Q validity scales correlated with the Portland digit recognition test. This finding might be due to the fact that simulators of PTSD did not feel that memory impairment was part of the disorder. In a recent study using the same paradigm to assess response bias in the context of traumatic brain injury, the PDRT had

adequate specificity and sensitivity, which was also supported by other literature (Huston, 2021; Gunstad & Suhr, 2008). Furthermore, hypothesis seven assessed the ability of the CAP-Q validity scales to differentiate between simulated PTSD responses versus the responses of participants in other diagnostic categories. To this end, the Infrequency, Defensiveness, and Consistency scales could detect simulation. However, Naivety was not able to. There is a lack of literature about the ability of similar Naivety scales to detect malingering, so the inability of this scale may be connected to the low internal inconsistency observed in this study.

Finally, hypothesis eight tested the concurrent validity of the traumatic event inventory by correlating the measure with the RDS and PDRT. The results of this hypothesis indicated that the TEI correlated with the RDS, but not with the PDRT. Given the previous argument provided with the similar findings observed in the CAP-Q validity scales, the same problem may be present here—malingering participants may not have viewed memory problems to be a part of PTSD symptom profiles.

4.1 Limitations

This study faced several limitations. The number of participants dropping out indicated an issue with retention. Potential issues related to this may be the overall length of the study. Participants were provided with two weeks to access their survey, and this time may have been too short. Furthermore, this resulted in a below-expected N for all groups assessed. This impacted the study by reducing overall statistical power. Better retention may have been achieved by increasing the time of data collection overall. Generalizability may have been affected by the low N in each group. The reliable digit span faced an issue where several participants in the non-simulating groups were unable

to complete both of the three-digit trials. The three-digit trial was therefore dropped from consideration. Although the full digit span instructions were provided, this may have been insufficient, and a sample trial may have benefited this study. The PDRT's validity may have suffered as a result of the decision to use a shortened form. Future research may want to instead use the more reliable and better researched full-form version.

4.2 Future Directions

Future studies should likely reduce the overall time that surveys take to complete. Additionally, given the current COVID-19 climate, extra consideration should be given to using extra instruction and sample trials for measures that are typically administered in person. While this study takes the first steps in validating the A-PTSD scale as both a standalone measure and as a modular section to the CAP-Q, further research is necessary to fully understand its clinical utility. Further research could additionally build on this study's methodology used to assess the effects of integrating new measures into pre-existing open-source measures on the validity of response bias scales. Given the previous argument that malingering poses a threat to the public health system, special attention is needed to maintain the integrity of open-source validity scales in light of new measures being developed.

4.3 Strengths

This study is strong in that it utilized an open-source battery, and provides a new measure that may be able to extend the clinical efficacy of this measure's ability to detect PTSD. PTSD has a yearly prevalence of 3.5% (American Psychiatric Association, 2013), and trauma is frequently comorbid with personality disorders like OCPD, borderline, and other mood disorders like depression (Flory & Yehuda, 2015; Yen et al., 2002). This

study suggests that the A-PTSD was efficacious in this regard while maintaining the integrity of the CAP-Q's response bias scales. The CAP-Q's response bias scales were additionally analyzed to ensure that they held concurrent validity with other measures of response bias. While these scales did not correlate with the PDRT, they correlated well with the RDS. Independently, the CAP-Q response bias scales showed their ability to differentiate between simulated PTSD and genuine PTSD/other diagnostic categories. This research provides the first stab into researching and expanding the ability of the CAP-Q to detect PTSD, and this may serve as a template for further research expanding the CAP-Q to detect other disorders.

REFERENCES

- Doane, B. M., Greve, K. W., & Bianchini, K. J. (2005). Agreement between the abbreviated and standard portland digit recognition test. *The Clinical neuropsychologist, 19*(1), 99–104. <https://doi.org/10.1080/13854040490524100>
- Ali, S., Jabeen, S., & Alam, F. (2015). Multimodal approach to identifying malingered posttraumatic stress disorder: A review. *Innovations in Clinical Neuroscience, 12*(1-2), 12.
- Al-Saffar, S., Borgå, P., & Hällström, T. (2002). Long-term consequences of unrecognised PTSD in general outpatient psychiatry. *Social psychiatry and psychiatric epidemiology, 37*(12), 580-585.
- American Psychiatric Association. (1987). *Diagnostic and Statistical Manual of Mental Disorders* (3rd revised ed.). <https://doi.org/https://doi.org/10.1176/appi.books.9780890425596>
- American Psychiatric Association (2000). *Diagnostic and statistical manual of mental disorders* (4th ed., Text Revision). Washington, DC: Author.
- American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders : DSM-5* (5th ed ed.). American Psychiatric Publishing.
- Amir, M., & Ramati, A. (2002). Post-traumatic symptoms, emotional distress and quality of life in long-term survivors of breast cancer: a preliminary research. *Journal of Anxiety Disorders, 16*(2), 191-206.
- Blevins, C. A., Weathers, F. W., Davis, M. T., Witte, T. K., & Domino, J. L. (2015). The posttraumatic stress disorder checklist for DSM-5 (PCL-5): Development and

- initial Psychometric Evaluation. *Journal of Traumatic Stress*, 28(6), 489–498.
<https://doi.org/10.1002/jts.22059>
- Brown, E. M. (1995). Posttraumatic Stress Disorder and Shell Shock: Social Section. *Berrios and Porter*, 501-08.
- Brown, T. A., Campbell, L. A., Lehman, C. L., Grisham, J. R., & Mancill, R. B. (2001). Current and lifetime comorbidity of the DSM-IV anxiety and mood disorders in a large clinical sample. *Journal of abnormal psychology*, 110(4), 585.
- Burriss, L., Ayers, E., Ginsberg, J., & Powell, D. A. (2008). Learning and memory impairment in PTSD: relationship to depression. *Depression and Anxiety*, 25(2), 149-157.
- Cloitre, M., Miranda, R., Stovall-McClough, K. C., & Han, H. (2005). Beyond PTSD: Emotion regulation and interpersonal problems as predictors of functional impairment in survivors of childhood abuse. *Behavior therapy*, 36(2), 119-124.
- Crocq, M. A., & Crocq, L. (2000). From shell shock and war neurosis to posttraumatic stress disorder: a history of psychotraumatology. *Dialogues in clinical neuroscience*, 2(1), 47-55. <https://doi.org/10.31887/DCNS.2000.2.1/macrocq>
- Danckwerts, A., & Leathem, J. (2003). Questioning the link between PTSD and cognitive dysfunction. *Neuropsychol Rev*, 13(4), 221-235.
<https://doi.org/10.1023/b:nerv.0000009485.76839.b7>
- Demakis, G. J., & Elhai, J. D. (2011). Neuropsychological and psychological aspects of malingered posttraumatic stress disorder. *Psychological Injury and Law*, 4(1), 24–31. <https://doi.org/10.1007/s12207-011-9099-y>.

- Doane, B. M., Greve, K. W., & Bianchini, K. J. (2005). Agreement between the abbreviated and standard portland digit recognition test. *Clin Neuropsychol*, *19*(1), 99-104. <https://doi.org/10.1080/13854040490524100>
- Ehlers, A., Mayou, R. A., & Bryant, B. (1998). Psychological predictors of chronic posttraumatic stress disorder after motor vehicle accidents. *Journal of abnormal psychology*, *107*(3), 508.
- Eldridge, T. M. (1992). Normative study of the Portland Digit Recognition Test| An assessment of the effects of motivation on neuropsychological evaluations.
- Elhai, J. D., Gold, P. B., Frueh, B. C., & Gold, S. N. (2000). Cross-validation of the MMPI-2 in detecting malingered posttraumatic stress disorder. *Journal of Personality Assessment*, *75*(3), 449–463.
https://doi.org/10.1207/s15327752jpa7503_06
- Flory, J. D., & Yehuda, R. (2015, June). *Comorbidity between post-traumatic stress disorder and major depressive disorder: Alternative explanations and treatment considerations*. Dialogues in clinical neuroscience. Retrieved June 24, 2022, from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4518698/>
- Foa, E. B., Cashman, L., Jaycox, L., & Perry, K. (1997). The Validation of a Self-Report Measure of Posttraumatic Stress Disorder: The Posttraumatic Diagnostic Scale. In (Vol. 9, pp. 445-451): Psychological Assessment.
- Fontenelle, L. F., Cocchi, L., Harrison, B. J., Shavitt, R. G., do Rosário, M. C., Ferrão, Y. A., ... & Torres, A. R. (2012). Towards a post-traumatic subtype of obsessive–compulsive disorder. *Journal of Anxiety Disorders*, *26*(2), 377-383.

- Galatzer-Levy, I. R., Nickerson, A., Litz, B. T., & Marmar, C. R. (2013). Patterns of lifetime PTSD comorbidity: A latent class analysis. *Depression and Anxiety, 30*(5), 489-496.
- Gunstad, J., & Suhr, J. A. (2004). Use of the abbreviated Portland digit recognition test in simulated malingering and neurological groups. *Journal of Forensic Neuropsychology, 4*(1), 33-47. https://doi.org/10.1300/j151v04n01_02.
- Guriel, J. L. (2004). *Detection of coached malingering of posttraumatic stress disorder*. West Virginia University.
- Graham, J. R. (1993). *MMPI-2: Assessing personality and psychopathology*. New York: Oxford University Press.
- Gray, M. J., Litz, B. T., Hsu, J. L., & Lombardo, T. W. (2004). Psychometric properties of the life events checklist. *Assessment, 11*(4), 330-341. <https://doi.org/10.1177/1073191104269954>
- Green, P. (2003). *Word Memory Test manual for Windows: user's manual*. Edmonton: Green's Publishing.
- Greiffenstein, M. F., Baker, W. J., & Gola, T. (1994). Validation of Malingered Amnesia Measures With a Large Clinical Sample. In (Vol. 6, pp. 218-224): *Psychological Assessment*.
- Guevara, F. (2019). *Post-Traumatic Stress Disorder*. Veterans Affairs. Retrieved from <https://hs.sbcounty.gov/va/Documents/18-PTSD.pdf>.
- Hall, R. C., & Hall, R. C. (2007). Detection of malingered PTSD: an overview of clinical, psychometric, and physiological assessment: where do we stand?. *Journal of Forensic Sciences, 52*(3), 717-725.

- Herman, D. S., Weathers, F. W., Litz, B. T., & Keane, T. M. (1996). Psychometric Properties of the Embedded and Stand-Alone Versions of the MMPI-2 Keane PTSD Scale. *Assessment, 3*(4), 437–442. <https://doi.org/10.1177/107319119600300409>
- Hjemdal, O., Friborg, O., Braun, S., Kempnaers, C., Linowski, P., & Fossion, P. (2011). The Resilience Scale for Adults: Construct Validity and Measurement in a Belgian Sample. In (Vol. 11, pp. 53-70): *International Journal of Testing*.
- Huston, C. A. (2021). Validation of the Tri-Choice Naming and Response Bias Measure [Master's thesis, Cleveland State University]. OhioLINK Electronic Theses and Dissertations Center. http://rave.ohiolink.edu/etdc/view?acc_num=csu16194338067807.
- 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.
- Kraepelin, 1856-1926. (1994). *American Journal of Psychiatry, 151*(3), 428–428. <https://doi.org/10.1176/ajp.151.3.428>
- Keane, T M., Malloy, P E, & Fairbank, J. A, (1984). Empirical development of an MMPI subscale for the assessment of combat-related posttraumatic stress disorder, *Journal of Consulting and Clinical Psychology, 52*, 888-891.
- McDevitt-Murphy, M.E., Weathers, F.W., Adkins, J.W. *et al.* Use of the Personality Assessment Inventory in Assessment of Posttraumatic Stress Disorder in Women. *J Psychopathol Behav Assess 27*, 57–65 (2005). <https://doi.org/10.1007/s10862-005-5380-2>

- Merskey, H. (1995). Post-traumatic stress disorder and shell shock: clinical section. *A history of clinical psychiatry*, 490-500.
- Merten, T., Thies, E., Schneider, K., & Stevens, A. (2009). Symptom validity testing in claimants with alleged posttraumatic stress disorder: comparing the Morel Emotional Numbing Test, the Structured Inventory of Malingering Symptomatology, and the Word Memory Test. *Psychological Injury and Law*, 2, 284–293.
- Morey, L. C. (2004). The Personality Assessment Inventory (PAI). In M. E. Maruish (Ed.), *The use of psychological testing for treatment planning and outcomes assessment: Instruments for adults* (pp. 509–551). Lawrence Erlbaum Associates Publishers.
- Morel, K. R. (1998). Development and preliminary validation of a forced-choice test of response bias for posttraumatic stress disorder. *J Pers Assess*, 70(2), 299-314.
https://doi.org/10.1207/s15327752jpa7002_8
- Morey, L. C. (2014). The Personality Assessment Inventory. In R. P. Archer & S. R. Smith (Eds.), *Personality assessment* (pp. 181–228). Routledge/Taylor & Francis Group.
- Mozley, S.L., Miller, M.W., Weathers, F.W. *et al.* Personality Assessment Inventory (PAI) Profiles of Male Veterans With Combat-Related Posttraumatic Stress Disorder. *J Psychopathol Behav Assess* 27, 179–189 (2005).
<https://doi.org/10.1007/s10862-005-0634-6>

- Nacasch, N., Fostick, L., & Zohar, J. (2011). High prevalence of obsessive–compulsive disorder among posttraumatic stress disorder patients. *European Neuropsychopharmacology*, *21*(12), 876-879.
- North, C. S., Surís, A. M., Smith, R. P., & King, R. V. (2016). The evolution of PTSD criteria across editions of DSM. , *28*, 3, *28*(3), 197-208.
- Poreh A. (2004). Traumatic Events Inventory (TEI). Quantified Process Scoring Systems. Cleveland, Ohio
- Poreh, A. M., & Levin, J. B. (2019). The Cleveland Adaptive Psychopathology Inventory: Preliminary validity and reliability of a multi-scale personality and psychopathology questionnaire. *Psychiatry and Clinical Psychopharmacology*, *29*(3), 276–284. <https://doi.org/10.1080/24750573.2019.1633724>
- Poreh, A. M., Rawlings, D., Claridge, G., Freeman, J. L., Faulkner, C., & Shelton, C. (2006). The BPQ: a scale for the assessment of borderline personality based on DSM-IV criteria. *Journal of personality disorders*, *20*(3), 247-260.
- Poreh, A. M., & Levin, J. B. (2019). The Cleveland Adaptive Psychopathology Inventory: Preliminary validity and reliability of a multi-scale personality and psychopathology questionnaire. *Psychiatry and Clinical Psychopharmacology*, *29*(3), 276–284. <https://doi.org/10.1080/24750573.2019.1633724>.
- Rosen, G. M. (2004). Litigation and reported rates of posttraumatic stress disorder. In (Vol. 36, pp. 1291-1294): *Personality and Individual Differences*.
- Rosen, G. M. (2006). DSM's cautionary guideline to rule out malingering can protect the PTSD data base. *J Anxiety Disord*, *20*(4), 530-535. <https://doi.org/10.1016/j.janxdis.2005.03.004>

- Rosen, G. M., & Phillips, W. R. (2004). A Cautionary Lesson from Simulated Patients. *J Am Acad Psychiatry Law*, 32(2), 132-133.
<https://www.ncbi.nlm.nih.gov/pubmed/15281413>
- Sakalli, Inisu. (2016, October 11). *3.4 understanding mental health - post traumatic stress disorder PTSD*. Retrieved from
<https://www.youtube.com/watch?v=ZfTqWIReOfw&list=PLegzHlGrVMo-JLYRoFMmCkrW-EXbHaLOX&index=8>.
- Scott, C. L. (2015). DSM-5 and Malingering. In *DSM-5 and the law changes and challenges*. essay, Oxford Univ. Press.
- Scotti, J. R., Sturges, L. V., & Lyons, J. A. (1996). The Keane PTSD Scale extracted from the MMPI: sensitivity and specificity with Vietnam veterans. *J Trauma Stress*, 9(3), 643-650. <https://doi.org/10.1007/BF02103673>
- Solomon, Z. (1989). PTSD and social functioning. *Social Psychiatry and Psychiatric Epidemiology*, 24(3), 127-133.
- Walczyk, J. J., Sewell, N., & DiBenedetto, M. B. (2018). A Review of Approaches to Detecting Malingering in Forensic Contexts and Promising Cognitive Load-Inducing Lie Detection Techniques. *Front Psychiatry*, 9, 700.
<https://doi.org/10.3389/fpsyt.2018.00700>
- Wechsler, D. (1955). Wechsler adult intelligence scale--. *Archives of Clinical Neuropsychology*.
- 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). [Assessment] Available from www.ptsd.va.gov.

- Wetzel RD, Murphy GE, Simons A, Lustman P, North C, Yutzy S. What Does the Keane PTSD Scale of the MMPI Measure? Repeated Measurements in a Group of Patients with Major Depression. *Psychological Reports*. 2003;92(3):781-786. doi:10.2466/pr0.2003.92.3.781
- Whitman, M. R., Tylicki, J. L., Mascioli, R., Pickle, J., & Ben-Porath, Y. S. (2021). Psychometric properties of the Minnesota Multiphasic Personality Inventory-3 (MMPI-3) in a clinical neuropsychology setting. *Psychological Assessment*, 33(2), 142–155. <https://doi.org/10.1037/pas0000969>
- Wolf, E. J., Miller, M. W., Orazem, R. J., Weierich, M. R., Castillo, D. T., Milford, J., Kaloupek, D. G., & Keane, T. M. (2008). The MMPI-2 Restructured Clinical Scales in the assessment of posttraumatic stress disorder and comorbid disorders. *Psychological Assessment*, 20(4), 327–340. <https://doi.org/10.1037/a0012948>
- Yen, S., Shea, T., Battle, C. L., Johnson, D. M., Zlotnick, C., Dolan-Sewell, R., Skodol, A. E., Grilo, C. M., Gunderson, J. G., Sanislow, C. A., Zanarini, M. C., Bender, D. S., Rettew, J. B., & McGlashan, T. H. (2002). Traumatic exposure and posttraumatic stress disorder in borderline, schizotypal, avoidant, and obsessive-compulsive personality disorders: FINDINGS from the Collaborative Longitudinal Personality Disorders Study. *The Journal of Nervous and Mental Disease*, 190(8), 510–518. <https://doi.org/10.1097/00005053-200208000-00003>

APPENDIX A: Tables

Table 1: Age, gender, and education by group

Scale	Gender (% Female)	Age		Education	
		M	SD	M	SD
PTSD embedded	67	44.60	13.43	4.62	1.54
PTSD not embedded	73	43.59	14.38	4.43	1.37
Simulators embedded	68	61.05	16.34	4.77	1.22
Simulators not embedded	76	50.59	18.56	4.90	1.36
Anxiety and depression embedded	53	38.45	15.51	4.47	1.39
Anxiety and depression not embedded	47	42.73	15.29	4.61	1.28
Control embedded	22	49.39	18.31	4.76	1.39
Control not embedded	29	39.18	14.05	4.97	1.19

Education: 1 = Some high school, no diploma. 2 = High school graduate, diploma or the equivalent (for example: GED), 3 = Some college credit, no degree, 4 = Associate's degree, 5 = Bachelor's degree, 6 = Master's degree, 7 = Doctoral Degree

Table 2: Education level as predicted by group membership

Education Level	Wald Chi-Square	Exp(B)	Sig.	95% Confidence Interval for Exp (B)	
				Lower Bound	Upper Bound
Some high school, no diploma	.560	1.07	.454	.89	1.29
High school graduate, diploma or the equivalent (for example: GED)	1.555	1.12	.212	.94	1.34
Some college credit, no degree	.010	1.01	.921	.87	1.17
Associate's degree	.250	1.04	.617	.90	1.21
Bachelor's degree	.816	1.08	.366	.91	1.28
Master's degree	1.963	1.13	.161	.95	1.33
Doctoral Degree	.330	1.04	.566	.91	1.20

Table 3: Internal consistency of the eight groups on the self-report PTSD measures

Group	PC-L 5	A-PTSD
PTSD embedded	.944	.859
PTSD not embedded	.917	.848
Simulators embedded	.942	.858
Simulators not embedded	.938	.937
Anxiety and depression embedded	.938	.858
Anxiety and depression not embedded	.927	.834
Control embedded	.959	.919
Control not embedded	.971	.888

Table 4: Scores of the eight groups on the self-report PTSD measures

Group	PC-L 5		A-PTSD	
	M	SD	M	SD
PTSD embedded	59.98	18.00	77.70	12.48
PTSD not embedded	67.33	15.68	82.58	12.21
Simulators embedded	83.45	13.35	95.42	9.33
Simulators not embedded	84.42	12.39	92.61	14.76
Anxiety and depression embedded	48.51	17.58	66.27	13.25
Anxiety and depression not embedded	46.78	15.73	66.67	11.47
Control embedded	38.35	17.65	58.07	16.14
Control not embedded	41.48	20.92	60.52	14.90

Table 5: Effect of diagnosis on A-PTSD scores

Dependent Variable	Parameters	B	SE(B)	t	Sig.
A-PTSD score	Intercept	108.009	3.42	31.62	< .001
	Age	-.302	.05	-5.79	< .001
	Diagnosis	-14.374	1.55	-.50	< .001

Table 6: Regression table analyzing the effect of embeddedness and age on CAP-Q scale scores.

Dependent Variable	Parameters	B	SE(B)	t	95% Confidence Interval	
					Lower Bound	Upper Bound
Paranoia	Intercept	22.679	1.37	16.62	20.00	25.36
	Age	.004	.03	.155	-.05	.05
	Embeddedness	-.291	.86	-.338	-1.99	1.40
Psychoticism	Intercept	19.35	1.47	13.16	16.46	22.24
	Age	.007	.03	.80	-.05	.06
	Embeddedness	.025	.93	.98	-1.80	1.85
Borderline	Intercept	29.249	1.45	19.93	26.36	32.14
	Age	-.054	.03	-2.09	-.11	.000
	Embeddedness	.239	.92	.79	-1.62	2.02
Sociopathy	Intercept	32.11	1.45	22.11	29.25	34.96
	Age	-.057	.03	-2.09	-.11	-.00
	Embeddedness	.239	.92	.26	-1.56	2.04
Avoidant	Intercept	30.508	1.18	25.86	28.19	32.83
	Age	-.060	.02	-2.73	-.10	-.02
	Embeddedness	-.208	.74	-.28	-1.67	1.26
OCPD	Intercept	18.982	.87	21.72	17.26	20.70
	Age	-.023	.02	-1.42	-.06	.01
	Embeddedness	-.270	.55	-.49	-1.36	.81
Anxiety	Intercept	33.651	1.36	24.81	30.98	36.32
	Age	-.042	.03	-1.63	-.09	.01
	Embeddedness	.337	.86	.39	-1.35	2.02
Depression	Intercept	30.634	1.47	20.78	27.74	33.53
	Age	-.029	.03	-1.04	-.08	.03
	Embeddedness	1.039	.93	1.12	-.79	2.87
Bipolar	Intercept	24.311	1.27	19.22	21.82	26.80
	Age	-.036	.02	-1.52	-.08	.01
	Embeddedness	-.229	.80	-.29	-1.80	1.34
Somatic	Intercept	26.63	1.39	19.21	23.90	29.36
	Age	-.001	.03	-.03	-.05	.05
	Embeddedness	.850	.88	.97	-.87	2.57
Alcohol use	Intercept	6.477	.73	8.92	5.05	7.91
	Age	.018	.01	1.33	-.01	.05
	Embeddedness	.672	.46	1.47	-.23	1.57
Drug use	Intercept	3.808	.50	7.60	2.82	4.79
	Age	.015	.01	1.64	-.00	.03
	Embeddedness	.444	.32	1.41	-.18	1.07
Substance use	Intercept	8.449	.94	9.01	6.60	10.30
	Age	.031	.02	1.77	-.00	.07
	Embeddedness	.929	.59	1.57	-.24	2.09
Naivety	Intercept	13.379	.59	22.78	12.22	14.53
	Age	.008	.01	.76	-.01	.03
	Embeddedness	.405	.37	1.09	-.32	1.13

Infrequency	Intercept	33.848	1.98	17.08	29.95	37.75
	Age	-.035	.04	-.94	-.11	.04
	Embeddedness	.781	1.25	.62	-1.68	3.24
Positive	Intercept	15.917	.84	19.02	14.27	17.56
	Age	.015	.02	.94	-.02	.05
	Embeddedness	-.350	.53	-.66	-1.39	.69
Consistency	Intercept	16.937	1.12	15.15	14.74	19.14
	Age	.011	.02	.52	-.03	.05
	Embeddedness	.400	.71	.57	-.99	1.79

Table 7: The effect of Simulated Responses on the CAP-Q validity scales.

Dependent Variable	Parameters	B	SE(B)	t	95% Confidence Interval	
					Lower Bound	Upper Bound
Naivety	Intercept	13.10	.91	14.34	11.30	14.90
	Age	.00	.01	.31	-.022	.03
	Malingering	.59	.54	1.10	-.47	1.65
Infrequency	Intercept	59.62	2.37	25.21	54.97	64.28
	Age	-.22	.04	-6.13	-.28	-.15
	Malingering	-18.86	1.39	-13.36	-21.61	-16.12
Positive	Intercept	8.20	1.11	7.42	6.03	10.38
	Age	.07	.02	4.3	.04	.10
	Malingering	5.06	.65	7.78	3.78	6.34
Consistency	Intercept	25.75	1.69	15.27	22.43	29.07
	Age	-.06	.03	-2.41	-.11	-.01
	Malingering	-6.09	.99	-6.14	-8.05	-4.14

APPENDIX B: Figures

Figure 1: Ethnicity by group membership

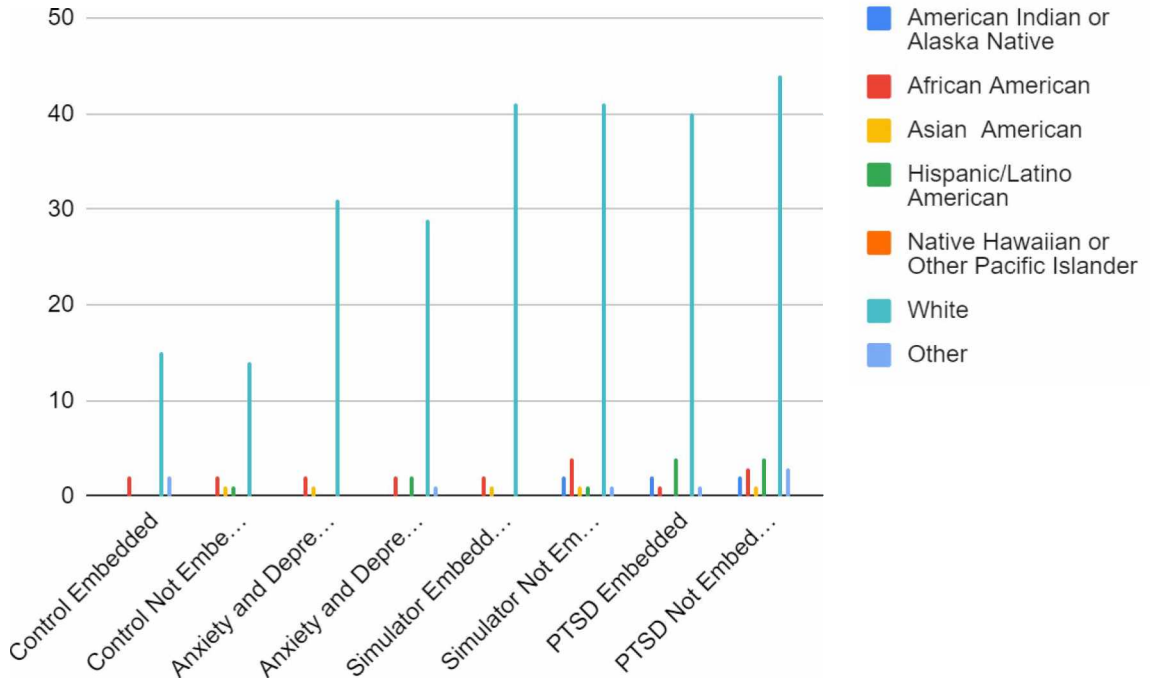
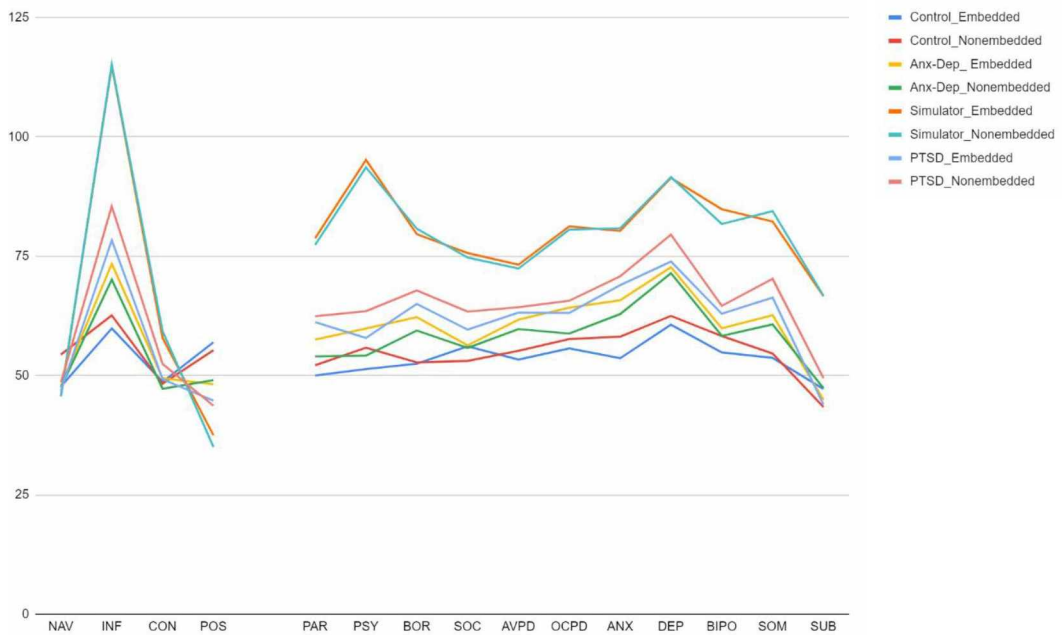


Figure 2: T-scores on the CAP-Q scales by group membership



APPENDIX C: A-PTSD Scale

(Likert scale: False, Slightly True, Mostly True, Very True)

- 1) On more than one occasion I have relived a past event like it was real.
- 2) I avoid places or situations that remind me of past events.
- 3) I have difficulty experiencing positive emotions like happiness or joy.
- 4) I sometimes get angry for no apparent reason.
- 5) Believing in myself helps me to overcome difficult times.
- 6) I often have unwanted thoughts about bad experiences I have had.
- 7) I try not to think about certain past events because they are so upsetting.
- 8) I like being in crowds and around people.
- 9) I am a laid-back person and I rarely get upset.
- 10) My future feels promising.
- 11) When I am in situations that remind me of past negative events, I experience strong feelings of fear, anger or shame.
- 12) Some of my friends and family members have commented that I am always on guard.
- 13) My family members or friends have commented that I have a bad temper.
- 14) In hard times, I know that better times will come.
- 15) Sometimes when I am awake, I have images of past events that feel real.
- 16) I am so sensitive about certain personal experiences that I cannot talk about them.
- 17) People describe me as being distant or cut off from others.
- 18) I have trouble experiencing pleasure even when good things are happening.
- 19) At some point in my life, I experienced a life-changing event, and since then, I have been taking risks that could cause me harm.
- 20) I have had situations where my life was in danger.
- 21) I have recurring and distressing dreams.
- 22) I feel shame or guilt about past events.
- 23) I am easily startled.
- 24) It does not take me long to recover from a stressful event.
- 25) I have recurrent unwanted memories about events from the past.
- 26) I have trouble remembering significant details from upsetting past events.
- 27) I enjoy the same hobbies and activities that I always have.
- 28) It is easy for me to snap back when something bad happens.
- 29) I sleep well.
- 30) People consider me as having a positive view of life.
- 31) It is easy for me to get through stressful events.
- 32) When I talk about my past, I often feel others cannot understand what I went through.
- 33) I feel distant or cut off from people around me.
- 34) I rarely have nightmares.
- 35) I rarely feel lonely or isolated.